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The Iowa Administrative Code Supplement is published biweekly pursuant to Iowa Code section 17A.6. The Supplement contains replacement chapters to be inserted in the loose-leaf Iowa Administrative Code (IAC) according to instructions included with each Supplement. The replacement chapters incorporate rule changes which have been adopted by the agencies and filed with the Administrative Rules Coordinator as provided in Iowa Code sections 7.17 and 17A.4 to 17A.6. To determine the specific changes in the rules, refer to the Iowa Administrative Bulletin bearing the same publication date.

In addition to the changes adopted by agencies, the replacement chapters may reflect objection to a rule or a portion of a rule filed by the Administrative Rules Review Committee (ARRC), the Governor, or the Attorney General pursuant to Iowa Code section 17A.4(6); an effective date delay imposed by the ARRC pursuant to section 17A.4(7) or 17A.8(9); rescission of a rule by the Governor pursuant to section 17A.4(8); or nullification of a rule by the General Assembly pursuant to Article III, section 40, of the Constitution of the State of Iowa.

The Supplement may also contain replacement pages for the IAC Index or the Uniform Rules on Agency Procedure.

INSTRUCTIONS

FOR UPDATING THE

IOWA ADMINISTRATIVE CODE

Agency names and numbers in bold below correspond to the divider tabs in the IAC binders. New and replacement chapters included in this Supplement are listed below. Carefully remove and insert chapters accordingly.

Editor's telephone (515)281-3355 or (515)242-6873

Credit Union Division[189]

- Replace Analysis
- Replace Chapter 12
- Replace Chapter 17

Insurance Division[191]

- Replace Analysis
- Replace Chapter 50

Utilities Division[199]

- Replace Chapter 24

Inspections and Appeals Department[481]

- Replace Analysis
- Replace Chapter 57
- Replace Chapters 62 and 63

Environmental Protection Commission[567]

- Replace Analysis
- Replace Chapters 40 to 44
- Replace Chapter 81
- Replace Chapter 83
- Replace Chapter 111

Public Health Department[641]

- Replace Analysis
- Replace Chapter 3
- Replace Chapters 37 to 41
- Replace Chapter 45
- Replace Chapter 80
- Remove Reserved Chapters 146 to 149
- Insert Chapter 146 and Reserved Chapters 147 to 149

Professional Licensure Division[645]

- Replace Analysis
- Replace Chapters 280 to 283

Pharmacy Board[657]

Replace Chapter 10

Replace Chapter 37

Public Safety Department[661]

Replace Chapter 502

Replace Chapters 551 and 552

Revenue Department[701]

Replace Chapters 41 and 42

Replace Chapters 103 to 105

Labor Services Division[875]

Replace Chapters 71 to 73

CREDIT UNION DIVISION[189]

Credit Union Department[295] renamed Credit Union Division[189] under the Department of Commerce by 1986 Iowa Acts, Senate File 2175, section 751, effective July 1, 1986. See IAB 9/10/86.

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189—12.1(533) Voting requirements and eligibility.

12.1(1) All elections are determined by plurality vote.

12.1(2) A member shall have one vote regardless of the number of or class of shares held by the member. Jointly held ownership shares are entitled to one vote, and joint tenants shall not be permitted to cast more than one vote per ownership share jointly held.

12.1(3) Members shall not vote by proxy.

12.1(4) A member other than a natural person may cast a single vote through a delegated agent.

12.1(5) Members shall be at least 16 years of age by the date of the meeting in order to vote, sign nominating petitions, or sign petitions requesting special meetings.

12.1(6) Members shall be at least 18 years of age by the date of the meeting where the election or appointment will occur in order to hold an elected or appointed position.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.2(533) Nomination procedures for the board of directors.

12.2(1) *Nominating committee.* If the board has determined that voting for directors at the annual meeting will be conducted via one or more methods other than only in-person voting at the meeting, then at least 120 days before each annual meeting, the chairperson of the board shall appoint a nominating committee of three or more members, none of whom are directors currently eligible for reelection or their immediate family members.

a. It is the duty of the nominating committee to nominate at least one member for each vacancy, including for any unexpired-term vacancy, for which elections are being held and to obtain a signed certificate from the members nominated that they are agreeable to the placing of their names in nomination, will accept office if elected, and will cooperate with any background check required by the credit union.

b. The nominating committee shall file its nominations with the secretary of the credit union board at least 90 days before the annual meeting.

c. Nominations made by the nominating committee are not subject to the petition process in subrule 12.2(2).

12.2(2) *Nominations by petition.* If the board of directors determines pursuant to subrule 12.3(1) that voting for directors will be conducted in whole or in part by mail or electronic ballots prior to the annual meeting, then nominations shall not be taken from the floor at the annual meeting and the nominating committee shall accept additional nominations by petition.

a. At least 90 days before the annual meeting, the secretary shall notify in writing all members eligible to vote that nominations for vacancies may be made by petition signed by at least 1 percent of the members, subject to a minimum of 20 members and a maximum of 200 members.

(1) The notice shall indicate that there will be no nominations from the floor at the annual meeting.

(2) The notice shall include a list of the nominating committee's nominees and a brief statement of the nominees' qualifications and biographical data in a form approved by the board of directors. Each nominee by petition shall submit a similar statement of qualifications and biographical data with the petition.

(3) Nominations by petition shall be accompanied by a signed certificate from the nominee stating that the nominee is agreeable to nomination, will serve if elected to office, and will cooperate with any background check required by the credit union.

(4) The period for receiving nominations by petition shall extend at least 30 days from the date that the notice is sent. Petitions shall be filed with the secretary of the credit union at least 60 days before the annual meeting.

(5) Nominations by petition which are received after the closing date, or which are otherwise incomplete because they do not include a statement of qualifications and biographical data, or certification agreeing to the nomination and indicating a willingness to serve, shall be disqualified by

the board secretary. The secretary shall immediately notify the nominee of the disqualification and of the reason. A petition for a disqualified nominee may be refiled provided that all requirements, including the closing date for receiving nominations by petition, are met.

b. The notice may be included with the notice of annual meeting, in statements or newsletters, on the credit union website, or on signs posted in the credit union.

c. The secretary may use electronic mail to notify members who have opted to receive notices or statements electronically.

12.2(3) Posting of nominations. The secretary shall ensure that all nominations are posted in a conspicuous place in each credit union office at least 30 days but no more than 60 days before the annual meeting.

12.2(4) Alternative schedule—voting only in person at annual meeting. If the board of directors determines that voting at the annual meeting shall only be conducted in person, and nominations will be taken from the floor at the annual meeting, the chairperson of the board shall appoint a nominating committee of three or more members, none of whom are directors currently eligible for reelection or their immediate family members, at least 60 days before the annual meeting. The nominating committee shall not solicit additional nominations by petition pursuant to subrule 12.2(2). Nominations shall be posted according to subrule 12.2(3).

12.2(5) Nomination notification by newsletter. The board of directors may determine that the entire credit union membership will be notified via newsletter or other written communication of the opportunity to nominate an individual for the board of directors.

a. If the membership is notified of nominations via newsletter or other written communication at least 90 days before the annual meeting, the secretary shall:

(1) Send the newsletter or other written communication to the entire membership via U.S. mail or electronic mail to members who have opted to receive notices or statements electronically and indicate a physical location or email address where nominations can be sent;

(2) Indicate in the notice that there will be no nominations from the floor at the annual meeting; and

(3) Indicate in the notice that the nominating committee will vet the candidates and present a list of the eligible candidates prior to the voting period.

b. If the board of directors utilizes the nomination notification by newsletter pursuant to this rule, then nominations shall not be taken from the floor at the annual meeting as set forth in subrule 12.3(7) and nomination notifications made pursuant to this rule are not subject to the nomination-by-petition process in subrule 12.2(2).

[ARC 0938C, IAB 8/7/13, effective 9/15/13; ARC 3734C, IAB 4/11/18, effective 5/16/18]

189—12.3(533) Election procedures for the board of directors.

12.3(1) Vote by board of directors. The board of directors shall, by majority vote, select the method of voting for the membership vote for the election of directors, in accordance with Iowa Code section 533.203. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. If the number of members who have opted to receive notices electronically is less than all members, the board may provide access to an electronic device in each credit union office for the members to vote electronically in order to satisfy the access requirement. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at the annual meeting, pursuant to the requirements of this rule.

12.3(2) Election committee. The board of directors shall appoint an election committee of not fewer than five members, none of whom may be a current director or nominee for office or an immediate family member of any director or nominee for office.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. The chairperson of the election committee shall announce the results of the election at the annual meeting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.203.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.3(3) Notice of balloting. At least 20 days but not more than 30 days prior to the close of balloting, the secretary shall produce a notice of balloting.

a. The notice of balloting shall state the names of the candidates for the board of directors. The name of each candidate shall be followed by a brief statement of the candidate's qualifications and biographical data in a form approved by the board of directors.

b. If the board of directors elected to accept additional nominations by petition, then the notice of balloting shall state that additional nominations shall not be taken from the floor at the annual meeting. In this event, the board may vote to conduct the election in any form permitted by Iowa Code section 533.203.

c. If the board of directors did not elect to accept additional nominations by petition, then the notice of balloting shall state that additional nominations will be taken from the floor at the annual meeting. In this event, the board may only vote to conduct the election in person at the annual meeting, and not by mail-in ballot, electronic voting, absentee voting, or any combination permitted by Iowa Code section 533.203.

d. The notice shall set forth the rules and procedures for voting and the date of the close of balloting for ballots submitted other than in person during voting at the annual meeting.

(1) The close of balloting for ballots submitted other than in person during voting at the annual meeting shall be at least two days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at the annual meeting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at the annual meeting and received within five business days after the closing date of balloting for ballots submitted other than in person during voting at the annual meeting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at the annual meeting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

e. The notice may be included with notice of the annual meeting and in statements or newsletters, on the credit union website, or on signs posted in the credit union.

f. Electronic mail may be used to provide the notice of balloting to members who have opted to receive notices or statements electronically.

12.3(4) Mailed ballots. If the board of directors, by majority vote, has elected to conduct the election in whole or in part by mailed ballot, then the secretary shall send with the notice of balloting a mail-in ballot.

- a.* The secretary shall include the following materials for balloting:
- (1) One ballot, clearly identified as the ballot, on which the names of the candidates for the board of directors are printed in random order.
 - (2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.
 - (3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.
 - (4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.
- b.* If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions for the electronic voting procedure.
- c.* Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.
- d.* If voting will also occur at the annual meeting, the ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the annual meeting. If voting is not scheduled to occur at the annual meeting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the close of balloting for ballots submitted other than in person during voting at the annual meeting.
- 12.3(5) *Electronic voting.*** If the board of directors, by majority vote, has elected to conduct the election in whole or in part by electronic voting, then the secretary shall include with the notice of balloting specific instructions for electronic voting.
- a.* The instruction sheet for electronic voting shall contain specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.
- b.* For those members who have opted to receive notices or statements electronically, the instructions for electronic voting required under this subrule may be communicated electronically.
- c.* The electronic voting shall be tallied by the election committee. If voting will also occur at the annual meeting, then the results shall be verified at the meeting.
- d.* If voting is not scheduled to occur at the annual meeting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the close of balloting for ballots submitted other than in person during voting at the annual meeting.
- 12.3(6) *Absentee ballots—subsequent in-person vote at meeting.*** If the board of directors, by majority vote, has elected to conduct the election only in person at the annual meeting, the board may also, by majority vote, utilize absentee ballots when no additional nominations will be taken from the floor at the annual meeting and when, in the opinion of the board, it is in the best interest of the credit union and its membership.
- a.* The secretary shall include with the notice of annual meeting a notification that members may vote either in person at the annual meeting or by absentee ballot if the member submits a written or electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at the annual meeting.
- b.* The secretary shall mail the balloting materials specified in paragraph 12.3(4) “*a*” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.
- c.* Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the annual meeting.
- d.* At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election

committee before the meeting. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.3(7) *Nominations from the floor—subsequent in-person vote at meeting.* If the board of directors did not elect to accept additional nominations by petition, then additional nominations shall be taken from the floor at the annual meeting, provided that no electronic, mail-in, or absentee balloting has occurred.

a. At the annual meeting, printed ballots shall be distributed to those in attendance after additional nominations are taken from the floor, or the ballots shall also have blank spaces to write in the additional names. The ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting.

b. After members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee.

c. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the annual meeting.

12.3(8) *In-person vote at meeting.* If the board of directors elected to accept additional nominations by petition, and if the board of directors also chose to conduct the vote in whole or in part by in-person voting at the annual meeting, printed ballots shall be distributed to those in attendance at the annual meeting who have not voted.

a. The ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting.

b. After those members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots.

c. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the annual meeting.

12.3(9) *Preservation of ballots.* Ballots shall be preserved according to the provisions of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date the results are certified to the board by the election committee.

12.3(10) *Publication of results.* Results of the election shall be reported to members according to the provisions of 189—12.10(533). The 60-day posting period required by subrule 12.10(1) shall run from the date the results are certified to the board by the election committee.

[ARC 0938C, IAB 8/7/13, effective 9/15/13; ARC 3734C, IAB 4/11/18, effective 5/16/18]

189—12.4(533) Vote to amend bylaws or articles of incorporation.

12.4(1) *Requirements.* Voting on amendments of bylaws and articles of incorporation shall be conducted in accordance with Iowa Code section 533.201. All amendments shall be approved by the superintendent before the amendments become effective.

12.4(2) *Vote by board of directors.* If the board of directors has elected upon a favorable vote of the majority that the board of directors shall vote on the amendment, then the amendment is adopted by a favorable vote of the majority of the board.

12.4(3) *Membership vote.* The board of directors may vote to conduct the vote on the amendment by a method other than a majority vote of the board of directors, as provided in Iowa Code section 533.201. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. If the number of members who have opted to receive notices electronically is less than all members, the board may provide access to an electronic device in each credit union office for the members to vote electronically in order to satisfy the access requirement. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at a meeting held for the purpose of voting, pursuant to the requirements of this rule.

12.4(4) *Election committee.* If the board of directors votes to conduct the vote on the amendment by a method other than a majority vote of the board of directors, as provided in Iowa Code section 533.201,

then the board shall appoint an election committee of not fewer than five members, none of whom may be directors.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. The chairperson of the election committee shall announce the results of the vote at the annual meeting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.201.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.4(5) Notice of balloting. The secretary shall set forth the proposed amendment in its entirety in a notice to all members eligible to vote at least 20 days but not more than 30 days prior to the closing date of balloting.

a. The notice shall set forth the rules and procedures for voting, the date of the close of balloting for ballots submitted other than in person at a meeting held for the purpose of voting, that balloting is subject to an affirmative vote of a majority of all members eligible to vote, and that no other vote on the subject shall be taken after the closing date of balloting except for votes cast in person at a meeting held for the purpose of voting. The notice shall also contain a summary of the board's reasons for recommending the amendment.

(1) The close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting shall be at least five days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting and received within five business days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote on the proposed amendment through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

b. The notice may be included in statements or newsletters, on the credit union website, or on signs posted in the credit union.

c. The notice may be sent electronically to those members who have opted to receive notices electronically.

12.4(6) Mailed ballots. If the board of directors has elected, upon a favorable vote of the majority, to conduct a vote on the proposed amendment in whole or in part via mailed ballot:

a. The secretary shall include the following materials for balloting with the notice of balloting:

(1) One ballot, clearly identified as the ballot, on which the proposed amendment is printed in full.
(2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.

(3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.

(4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.

b. If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions and notices for the electronic voting procedure.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.

d. If additional voting will be conducted at a meeting of members, the tallies shall be placed in the ballot boxes, and the ballot boxes shall be resealed to be taken to the meeting. If voting is not scheduled to occur at a meeting, the election committee shall tally the total votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.4(7) *Electronic voting.* If the board of directors, by majority vote, has elected to conduct the vote in whole or in part by electronic voting, then the secretary shall include with the notice of balloting specific instructions for electronic voting to each member eligible to vote.

a. The instruction sheet for electronic voting shall contain specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.

b. For those members who have opted to receive notices or statements electronically, the instructions required under this subrule may be communicated electronically.

c. The electronic voting shall be tallied by the election committee. If voting will also occur at a meeting, then the results shall be verified at the meeting.

d. If voting is not scheduled to occur at a meeting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.4(8) *Absentee ballots—subsequent in-person vote at meeting.* If the board of directors, by majority vote, has elected to conduct the vote only in person at a meeting of members, the board may also, by majority vote, utilize absentee ballots when, in the opinion of the board, it is in the best interest of the credit union and its membership.

a. The secretary shall include with the notice of balloting a statement that members may vote either in person at the meeting of members or by absentee ballot if the member submits a written or electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

b. The secretary shall mail the balloting materials specified in paragraph 12.4(6) “*a*” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the meeting.

d. At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any

previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.4(9) *In-person voting at meeting.* If the board of directors has elected, upon a favorable vote of the majority, to present the proposed amendment for a vote in whole or in part at a meeting of members, printed ballots shall be given at the meeting to those members who have not voted by another method.

a. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting.

b. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots.

c. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.4(10) *Preservation of ballots.* Ballots shall be preserved according to the requirements of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date of final approval or denial of the amendment by the superintendent.

12.4(11) *Submission to superintendent.* The board of directors shall submit the amendment to the superintendent for approval before the amendment becomes effective. The board shall submit the following documentation in support of its request for approval:

a. A certified copy of the board minutes which contain the recommendation to submit the amendment to a vote of the membership.

b. A certified copy of the notices provided to members.

c. A certified copy of any ballots provided to members.

d. A certified statement, including the vote count, that a majority of the eligible members voted in favor of the proposed amendment.

12.4(12) *Publication of results.* The board shall inform the membership of the results of the vote and whether the amendment received the approval of the superintendent, according to the provisions of 189—12.10(533). The 60-day posting period required by subrule 12.10(1) shall run from the date of final approval or denial of the amendment by the superintendent.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.5(533) Vote to modify, amend, or reverse an act of the board of directors or to instruct the board to take action.

12.5(1) *Vote of members at meeting.* The majority of members present at any meeting may vote to modify, amend, or reverse any act of the board of directors or instruct the board to take action not inconsistent with the articles of incorporation, the bylaws, or the Iowa credit union Act or administrative rules.

12.5(2) *Subsequent vote of membership.* In order to be binding upon the board of directors, any action taken by the membership to modify, amend, or reverse an act of the board, or to instruct the board to take action, requires an affirmative vote of a majority of all eligible members obtained by submitting the modification, amendment, reversal, or instruction to the members for a vote.

a. After a majority of members present at a meeting have voted to modify, amend, or reverse any act of the board of directors, or to instruct the board to take action not inconsistent with the articles, the bylaws, or the Iowa credit union Act or administrative rules, the board of directors shall meet to determine the method of voting for the membership vote and shall, within 60 days of the date of the meeting where the majority of members voted to modify, amend, or reverse an act of the board of directors, or to instruct the board to take action, submit the issue to all eligible voters of record as of the date of the meeting.

b. The board of directors shall, by majority vote, select the method of voting for the membership vote, in accordance with Iowa Code section 533.203. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. If the number of members who have opted to receive notices electronically is less than all members, the board may provide access to an electronic device in each credit union office for the members to vote electronically in order

to satisfy the access requirement. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at a meeting held for the purpose of voting, pursuant to the requirements of this rule.

c. If a simple majority of all eligible members vote in favor of the amendment, modification, reversal or instruction to take action, the vote of the members taken at the annual or special meeting shall be considered affirmed, and the board of directors shall take immediate action to comply with the directions of the membership. However, if a simple majority of all eligible members failed to vote in favor of the amendment, modification, reversal or instruction to take action, the vote of the members taken at the annual or special meeting is not affirmed, and the prior action of the board of directors shall be considered upheld.

12.5(3) Election committee. The board shall appoint an election committee of not fewer than five members, no more than two of whom may be from the board of directors.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. If the balloting includes a vote taken at a meeting of members, the chairperson of the election committee shall announce the results of the election at the meeting; otherwise, the chairperson shall certify the vote to the board within five days of the close of balloting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.203.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.5(4) Notice of balloting. The secretary shall set forth the proposed amendment, modification, reversal or instruction to take action in its entirety in a notice to all members eligible to vote at least 20 days but not more than 30 days prior to the closing date of balloting.

a. The notice shall set forth the rules and procedures for voting, the date of the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting, that balloting is subject to an affirmative vote of a majority of all members eligible to vote, and that no other vote on the subject shall be taken after the closing date of balloting except for votes cast in person during voting at a meeting held for the purpose of voting. The notice shall also contain a summary of the board's reasons for its action or inaction, as well as a summary of the reasons, if known, for the vote to amend, modify, or reverse the board action, or to instruct the board to take action.

(1) The close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting shall be at least five days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting and received within five business days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

b. The notice may be included in statements or newsletters, on the credit union website, or on signs posted in the credit union.

c. The notice may be sent electronically to those members who have opted to receive notices electronically.

12.5(5) Mailed ballots. If the board voted by majority vote to conduct the vote in whole or in part by mailed ballot:

a. The secretary shall include the following balloting materials with the notice of balloting:

(1) One ballot, clearly identified as the ballot, on which the proposed amendment, modification, or reversal, or instruction to the board to take action, is printed in full.

(2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.

(3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.

(4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.

b. If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions and notices for the electronic voting procedure.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.

d. If additional voting will be conducted at a meeting of members, the tallies shall be placed in the ballot boxes, and the ballot boxes shall be resealed to be taken to the meeting. If no other voting is scheduled to occur, the election committee shall tally the total votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.5(6) Electronic voting. If the board voted by majority vote to conduct the vote in whole or in part by electronic voting:

a. The secretary shall include with the notice of balloting specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.

b. For those members who have opted to receive notices or statements electronically, the instructions required under this subrule may be communicated electronically.

c. The electronic voting shall be tallied by the election committee prior to any meeting where voting is also scheduled to take place, and the committee shall take the tallies to the meeting. If no meeting is scheduled for voting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.5(7) Absentee ballots—subsequent in-person vote at meeting. If the board of directors, by majority vote, has elected to conduct the vote only in person at a meeting of members, the board may also, by majority vote, utilize absentee ballots when, in the opinion of the board, it is in the best interest of the credit union and its membership.

a. The secretary shall include with the notice of balloting a statement that members may vote either in person at the meeting of members or by absentee ballot if the member submits a written or

electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

b. The secretary shall mail the balloting materials specified in paragraph 12.5(5) “a” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the meeting.

d. At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.5(8) *In-person vote at meeting.* If the board voted by majority vote to conduct the vote in whole or in part at a meeting of members, then printed ballots on which the proposed amendment, modification, or reversal, or instruction to the board to take action, is printed in full shall be distributed to those in attendance at the meeting who have not voted by another method, and the ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After those members have been given an opportunity to vote at the meeting, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.5(9) *Preservation of ballots.* Ballots shall be preserved according to the requirements of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date the results are certified to the board by the election committee.

12.5(10) *Publication of results.* The board shall inform the membership of the results of the vote according to the provisions of 189—12.10(533). The 60-day posting period required by subrule 12.10(1) shall run from the date the results are certified to the board by the election committee.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.6(533) Vote on merger.

12.6(1) *Vote by board of directors.* A state credit union that seeks to merge with another credit union shall proceed pursuant to a plan agreed upon by a favorable vote of a majority of directors.

12.6(2) *Subsequent vote of the membership.* Following a vote by the board of directors to merge with another credit union, the board shall submit the merger to a vote of the membership of the merging credit union unless the superintendent finds that an emergency exists justifying the waiver of the membership vote.

a. The board of the continuing credit union shall, within three days of voting to merge, notify the superintendent of the merger vote.

b. After the superintendent has given preliminary approval to the merger, the board of the merging credit union shall submit the issue within 30 days to all eligible voters of record as of the date of the vote by the board of directors. The board of directors shall, by majority vote, select the method of voting for the membership vote, in accordance with Iowa Code section 533.203. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. If the number of members who have opted to receive notices electronically is less than all members, the board may provide access to an electronic device in each credit union office for the members to vote electronically in order to satisfy the access requirement. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at a meeting held for the purpose of voting, pursuant to the requirements of this rule.

c. The approval of the merger is not final until approved by the superintendent after the membership vote of the merging credit union.

12.6(3) Election committee. The board shall appoint an election committee of not fewer than five members, no more than two of whom may be from the board of directors.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. If the balloting includes a vote taken at a meeting of members, the chairperson of the election committee shall announce the results of the vote at the meeting; otherwise, the chairperson shall certify the vote to the board within five days of the close of balloting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.203.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.6(4) Notice of balloting. The secretary shall set forth the proposed merger in a notice to all members eligible to vote at least 20 days but not more than 30 days prior to the closing date of balloting.

a. The notice shall set forth the rules and procedures for voting, the date of the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting, that balloting is subject to an affirmative vote of a majority of all members eligible to vote, and that no other vote on the subject shall be taken after the closing date of balloting except for votes cast in person during voting at a meeting held for the purpose of voting. The notice shall also contain a summary of the board's reasons for voting to merge.

(1) The close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting shall be at least five days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting and received within five business days after the closing date of balloting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote on the proposed merger through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

b. The notice may be included in statements or newsletters, on the credit union website, or on signs posted in the credit union.

c. The notice may be sent electronically to those members who have opted to receive notices electronically.

12.6(5) Mailed ballots. If the board voted by majority vote to conduct the vote in whole or in part by mailed ballot:

a. The secretary shall include the following balloting materials with the notice of balloting:

(1) One ballot, clearly identified as the ballot.

(2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.

(3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.

(4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.

b. If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions and notices for the electronic voting procedure.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.

d. If additional voting will be conducted at a meeting of members, the tallies shall be placed in the ballot boxes, and the ballot boxes shall be resealed to be taken to the meeting. If no other voting is scheduled to occur, the election committee shall tally the total votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.6(6) Electronic voting. If the board voted by majority vote to conduct the vote in whole or in part by electronic voting:

a. The secretary shall include with the notice of balloting specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.

b. For those members who have opted to receive notices or statements electronically, the instructions required under this subrule may be communicated electronically.

c. The electronic voting shall be tallied by the election committee prior to any meeting where voting is also scheduled to take place, and the committee shall take the tallies to the meeting. If no meeting is scheduled for voting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.6(7) Absentee ballots—subsequent in-person vote at meeting. If the board of directors, by majority vote, has elected to conduct the vote only in person at a meeting of members, the board may also, by majority vote, utilize absentee ballots when, in the opinion of the board, it is in the best interest of the credit union and its membership.

a. The secretary shall include with the notice of balloting a statement that members may vote either in person at the meeting of members or by absentee ballot if the member submits a written or electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

b. The secretary shall mail the balloting materials specified in paragraph 12.6(5) “a” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the meeting.

d. At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After the members have been given an opportunity to vote, balloting

shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.6(8) *In-person vote at meeting.* If the board voted by majority vote to conduct the vote in whole or in part at a meeting of members, then printed ballots shall be distributed to those in attendance at the meeting who have not voted by another method, and the ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After those members have been given an opportunity to vote at the meeting, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.6(9) *Preservation of ballots.* Ballots shall be preserved according to the requirements of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date the results are certified to the board by the election committee.

12.6(10) *Submission to superintendent.* The board of directors shall submit the merger to the superintendent for approval before the merger becomes effective. The board shall submit the following documentation in support of its request for approval:

- a. A certified copy of the board minutes which contain the vote of the board of directors to approve the merger and to submit the merger to a vote of the membership.
- b. A certified copy of the notices provided to members.
- c. A certified copy of any ballots provided to members.
- d. A certified statement, including the vote count, that a majority of the eligible members voted in favor of the proposed merger.

12.6(11) *Publication of results.* The board shall inform the membership of the results of the vote according to the provisions of 189—12.10(533). The 60-day posting period required by subrule 12.10(1) shall run from the date the results are certified to the board by the election committee.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.7(533) Vote on voluntary dissolution.

12.7(1) *Vote of board of directors.* A state credit union that seeks to dissolve shall proceed pursuant to a plan agreed upon by a favorable vote of a majority of directors. Within three days of the vote and prior to sending notice of the membership vote, the board of directors shall notify the superintendent of the intention to dissolve.

12.7(2) *Subsequent vote of the membership.* Following a vote by the board of directors to dissolve, the board shall submit the dissolution to a vote of the membership.

- a. The board shall submit the issue to the membership within 30 days of voting to dissolve.
- b. The board shall submit the issue to all eligible voters of record as of the date of the vote by the board of directors.
- c. The board of directors shall, by majority vote, select the method of voting for the membership vote, in accordance with Iowa Code section 533.203. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. If the number of members who have opted to receive notices electronically is less than all members, the board may provide access to an electronic device in each credit union office for the members to vote electronically in order to satisfy the access requirement. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at a meeting held for the purpose of voting, pursuant to the requirements of this rule.
- d. The approval of the dissolution is not final until the superintendent issues a certificate of dissolution.

12.7(3) *Election committee.* The board shall appoint an election committee of not fewer than five members, no more than two of whom may be from the board of directors.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. If the balloting includes a vote taken at a meeting of members, the chairperson of the election committee shall announce the results of the election at the meeting; otherwise, the chairperson shall certify the vote to the board within five days of the close of balloting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.203.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.7(4) Notice of balloting. The secretary shall set forth the proposed dissolution in a notice to all members eligible to vote at least 20 days but not more than 30 days prior to the closing date of balloting.

a. The notice shall set forth the rules and procedures for voting, the date of the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting, that balloting is subject to an affirmative vote of a majority of all members eligible to vote, and that no other vote on the subject shall be taken after the closing date of balloting except for votes cast in person during voting at a meeting held for the purpose of voting. The notice shall also contain a summary of the board's reasons for voting for the voluntary dissolution.

(1) The close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting shall be at least five days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting and received within five business days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote on the proposed dissolution through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

b. The notice may be included in statements or newsletters, on the credit union website, or on signs posted in the credit union.

c. The notice may be sent electronically to those members who have opted to receive notices electronically.

12.7(5) Mailed ballots. If the board voted by majority vote to conduct the vote in whole or in part by mailed ballot:

a. The secretary shall include the following balloting materials with the notice of balloting:

(1) One ballot, clearly identified as the ballot.

(2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.

(3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.

(4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.

b. If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions and notices for the electronic voting procedure.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.

d. If additional voting will be conducted at a meeting of members, the tallies shall be placed in the ballot boxes, and the ballot boxes shall be resealed to be taken to the meeting. If no other voting is scheduled to occur, the election committee shall tally the total votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.7(6) *Electronic voting.* If the board voted by majority vote to conduct the vote in whole or in part by electronic voting:

a. The secretary shall include with the notice of balloting specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.

b. For those members who have opted to receive notices or statements electronically, the instructions required under this subrule may be communicated electronically.

c. The electronic voting shall be tallied by the election committee prior to any meeting where voting is also scheduled to take place, and the committee shall take the tallies to the meeting. If no meeting is scheduled for voting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.7(7) *Absentee ballots—subsequent in-person vote at meeting.* If the board of directors, by majority vote, has elected to conduct the vote only in person at a meeting of members, the board may also, by majority vote, utilize absentee ballots when, in the opinion of the board, it is in the best interest of the credit union and its membership.

a. The secretary shall include with the notice of balloting a statement that members may vote either in person at the meeting of members or by absentee ballot if the member submits a written or electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

b. The secretary shall mail the balloting materials specified in paragraph 12.7(5) “a” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the meeting.

d. At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.7(8) *In-person vote at meeting.* If the board voted by majority vote to conduct the vote in whole or in part at a meeting of members, then printed ballots shall be distributed to those in attendance at the meeting who have not voted by another method, and the ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee. After those members have been given an opportunity to vote at the meeting, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.7(9) *Preservation of ballots.* Ballots shall be preserved according to the requirements of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date the results are certified to the board by the election committee.

12.7(10) *Submission to superintendent.* The board of directors shall submit the dissolution to the superintendent for review before the dissolution becomes effective. The state credit union shall cease existence when the superintendent issues a certificate of dissolution. The board shall submit the following documentation:

- a. A certified copy of the board minutes which contain the vote of the board of directors to approve the plan and to submit the dissolution to a vote of the membership.
- b. A certified copy of the notices provided to members.
- c. A certified copy of any ballots provided to members.
- d. A certified statement, including the vote count, that a majority of the eligible members voted in favor of the proposed dissolution.
- e. Proof that is satisfactory to the superintendent that all assets have been liquidated from which there is a reasonable expectation of realization, that the liabilities of the state credit union have been discharged and distribution made to its members, and that the liquidation has been completed.

12.7(11) *Publication of results.* The board shall inform the membership of the results of the vote according to the provisions of 189—12.10(533). The 60-day posting period required by subrule 12.10(1) shall run from the date the results are certified to the board by the election committee.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.8(533) Vote to remove or reinstate an officer, director, or member of the auditing committee.

12.8(1) *Auditing committee vote.* If the auditing committee deems the action to be necessary to the proper conduct of the state credit union, the auditing committee may suspend, by majority vote, any officer, director, or member of the auditing committee.

12.8(2) *Subsequent vote of membership.* Following a vote by the auditing committee to suspend an officer, director, or member of the auditing committee, the suspension shall be put to a vote of the membership.

a. The members may vote to sustain the suspension and remove the officer, director, or auditing committee member permanently or may vote to reinstate the officer, director, or auditing committee member.

b. The board of directors shall meet to determine the method of voting for the membership vote and shall, within 30 days of the date of the auditing committee's vote, submit the issue to all eligible voters of record as of the date of the auditing committee's meeting. The board of directors shall, by majority vote, select the method of voting for the membership vote, in accordance with Iowa Code section 533.203. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. If the number of members who have opted to receive notices electronically is less than all members, the board may provide access to an electronic device in each credit union office for the members to vote electronically in order to satisfy the access requirement. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at a meeting held for the purpose of voting, pursuant to the requirements of this rule.

12.8(3) Election committee. The board shall appoint an election committee of not fewer than five members, no more than two of whom may be from the board of directors and none of whom may be from the auditing committee.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. If the balloting includes a vote taken at a meeting of members, the chairperson of the election committee shall announce the results of the election at the meeting; otherwise, the chairperson shall certify the vote to the board within five days of the close of balloting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.203.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.8(4) Notice of balloting. The secretary shall set forth the suspension and proposed removal in a notice to all members eligible to vote at least 20 days but not more than 30 days prior to the closing date of balloting.

a. The notice shall set forth the rules and procedures for voting, the date of the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting, that balloting is subject to an affirmative vote of a majority of all members eligible to vote, and that no other vote on the subject shall be taken after the closing date of balloting except for votes cast in person during voting at a meeting held for the purpose of voting. The notice shall also contain a summary of the auditing committee's reasons for voting to suspend the officer, director, or member of the auditing committee, as well as a summary of the reasons, if known, that the officer, director, or member of the auditing committee believes that the officer, director, or member should be reinstated.

(1) The close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting shall be at least five days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting and received within five business days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote on the proposed removal through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

b. The notice may be included in statements or newsletters, on the credit union website, or on signs posted in the credit union.

c. The notice may be sent electronically to those members who have opted to receive notices electronically.

12.8(5) Mailed ballots. If the board voted by majority vote to conduct the vote in whole or in part by mailed ballot:

a. The secretary shall include the following balloting materials with the notice of balloting:

(1) One ballot, clearly identified as the ballot.

(2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.

(3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.

(4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.

b. If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions and notices for the electronic voting procedure.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.

d. If additional voting will be conducted at a meeting of members, the tallies shall be placed in the ballot boxes, and the ballot boxes shall be resealed to be taken to the meeting. If no other voting is scheduled to occur, the election committee shall tally the total votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.8(6) Electronic voting. If the board voted by majority vote to conduct the vote in whole or in part by electronic voting:

a. The secretary shall include with the notice of balloting specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.

b. For those members who have opted to receive notices or statements electronically, the instructions required under this subrule may be communicated electronically.

c. The electronic voting shall be tallied by the election committee prior to any meeting where voting is also scheduled to take place, and the committee shall take the tallies to the meeting. If no meeting is scheduled for voting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.8(7) Absentee ballots—subsequent in-person vote at meeting. If the board of directors, by majority vote, has elected to conduct the vote only in person at a meeting of members, the board may also, by majority vote, utilize absentee ballots when, in the opinion of the board, it is in the best interest of the credit union and its membership.

a. The secretary shall include with the notice of balloting a statement that members may vote either in person at the meeting of members or by absentee ballot if the member submits a written or electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

b. The secretary shall mail the balloting materials specified in paragraph 12.8(5) “a” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the meeting.

d. At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.8(8) *In-person vote at meeting.* If the board voted by majority vote to conduct the vote in whole or in part at a meeting of members, then printed ballots shall be distributed to those in attendance at the meeting who have not voted by another method, and the ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee. After those members have been given an opportunity to vote at the meeting, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.8(9) *Preservation of ballots.* Ballots shall be preserved according to the requirements of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date the results are certified to the board by the election committee.

12.8(10) *Publication of results.* The board shall inform the membership of the results of the vote according to the provisions of 189—12.10(533). The 60-day posting period required by subrule 12.10(1) shall run from the date the results are certified to the board by the election committee.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.9(533) Preservation of ballots.

12.9(1) Immediately upon certification of the results of the vote by the election committee, any written ballots shall be sealed and appropriately labeled. Electronic vote results shall be saved electronically.

12.9(2) All ballots and voting results shall be retained by the credit union for at least 60 days, and until any disputes are resolved.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.10(533) Reporting the results of the vote to the membership.

12.10(1) *Posting of results.* Except as otherwise provided for a membership vote, the board shall inform the membership of the results of the vote by conspicuously posting notice in each credit union office for a period of 60 days.

12.10(2) *Publication of results.* Except as otherwise provided for a membership vote, in addition to posting the results in each credit union office, the board shall also communicate the results to the membership by at least one of the following methods:

- a. Include the results in the next mailing of the member's statement of account.
- b. Include the results in the credit union newsletter.
- c. Include the results in the sponsor's newsletter.
- d. Post a notice on the credit union's website.
- e. Place a notice in a newspaper of general circulation within the geographic area of operation of the credit union.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.11(533) Vote on sale of assets by corporate central credit union.

12.11(1) *Board of directors' vote.* A corporate central credit union that seeks to sell all of its assets to another corporate credit union shall proceed pursuant to a plan agreed upon by a favorable vote of a majority of directors. The board shall notify the superintendent within three days.

12.11(2) *Subsequent vote of the membership.* Following a vote by the board of directors to approve a plan to sell all of the corporate central credit union's assets to another corporate credit union, the board shall submit the plan to a vote of the membership.

a. The board shall submit the issue within 30 days of voting to approve the plan to all eligible voters of record as of the date of the vote by the board of directors.

b. The board of directors shall, by majority vote, select the method of voting for the membership vote, in accordance with Iowa Code section 533.203. Each credit union member shall have a meaningful opportunity to vote in a membership vote. The board of directors shall vote to conduct the vote in whole by electronic voting only if all members have access to an electronic voting device. Otherwise, the board shall also conduct the vote in part by mail-in ballot or in person at a meeting held for the purpose of voting, pursuant to the requirements of this rule.

c. The approval of the sale is not final until approved by the superintendent after the membership vote.

12.11(3) *Election committee.* The board shall appoint an election committee of not fewer than five members, no more than two of whom may be from the board of directors.

a. It is the duty of the election committee to oversee balloting, to tabulate votes, and to ensure that each member shall only be allowed to vote once and that multiple ballots submitted by the same member are disqualified.

b. The election committee shall elect a chairperson from among the committee members. If the balloting includes a vote taken at a meeting of members, the chairperson of the election committee shall announce the results of the election at the meeting; otherwise, the chairperson shall certify the vote to the board within five days of the close of balloting.

c. No member or agent of the election committee shall reveal the manner in which any member voted.

d. If the board of directors, by majority vote, has elected to utilize electronic voting, the election committee shall test the integrity of the electronic voting system at regular intervals during the election period. In the event of a malfunction of the electronic voting system, the board may in its discretion order the election to be held in another form, consistent with Iowa Code section 533.203.

e. For electronic ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as registered in the electronic voting system.

f. For mail-in ballots, including absentee ballots, it is the duty of the election committee to verify, or cause to be verified, the name and credit union account number of the voter as they appear on the identification form, to place the verified identification form and the sealed ballot envelope in a place of safekeeping pending the count of the vote, and, in the case of a questionable or challenged identification form, to retain the identification form and sealed ballot envelope together until the verification or challenge has been resolved.

12.11(4) *Notice of balloting.* The secretary shall set forth the proposed sale in a notice to all members eligible to vote at least 20 days but not more than 30 days prior to the closing date of balloting.

a. The notice shall set forth the rules and procedures for voting, the date of the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting, that balloting is subject to an affirmative vote of a majority of all members eligible to vote, and that no other vote on the subject shall be taken after the closing date of balloting except for votes cast in person during voting at a meeting held for the purpose of voting. The notice shall also contain a summary of the board's reasons for selling the assets.

(1) The close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting shall be at least five days prior to any meeting where voting will occur.

(2) Electronic ballots shall be submitted no later than midnight on the date balloting closes for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(3) Ballots mailed to the credit union shall be postmarked no later than the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting and received within five business days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(4) Ballots hand-delivered to the credit union shall be received prior to the close of normal credit union business hours on the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting in order to be considered valid.

(5) If more than one method of voting will be used, the notice shall also communicate that members have the right to vote on the proposed sale through any of the methods of voting designated by the board, but that members will only be allowed to vote once.

b. The notice may be included in statements or newsletters or on the credit union website.

c. The notice may be sent electronically to those members who have opted to receive notices electronically.

12.11(5) Mailed ballots. If the board voted by majority vote to conduct the vote in whole or in part by mailed ballot:

a. The secretary shall include the following balloting materials with the notice of balloting:

(1) One ballot, clearly identified as the ballot.

(2) One ballot envelope clearly marked “ballot” with instructions that the completed ballot shall be placed in that envelope and sealed.

(3) One identification form to be completed so as to include the name, address, signature, and credit union account number of the voter.

(4) One mailing envelope in which the voter, following instructions provided, shall insert the sealed “ballot” envelope and the identification form. The mailing envelope shall be preaddressed for return to the election committee.

b. If the credit union will also be conducting electronic voting, the mail-in ballot is not required for members who have opted to receive notices or statements electronically, and electronic mail may be used to provide the instructions and notices for the electronic voting procedure.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and placed in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee.

d. If additional voting will be conducted at a meeting of members, the tallies shall be placed in the ballot boxes, and the ballot boxes shall be resealed to be taken to the meeting. If no other voting is scheduled to occur, the election committee shall tally the total votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.11(6) Electronic voting. If the board voted by majority vote to conduct the vote in whole or in part by electronic voting:

a. The secretary shall include with the notice of balloting specific instructions for electronic voting, including how to access and use the electronic voting system, and the period of time in which votes will be taken.

b. For those members who have opted to receive notices or statements electronically, the instructions required under this subrule may be communicated electronically.

c. The electronic voting shall be tallied by the election committee prior to any meeting where voting is also scheduled to take place, and the committee shall take the tallies to the meeting. If no meeting is scheduled for voting, the election committee shall tally the votes and certify the vote count to the board no later than five days after the closing date of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

12.11(7) Absentee ballots—subsequent in-person vote at meeting. If the board of directors, by majority vote, has elected to conduct the vote only in person at a meeting of members, the board may also, by majority vote, utilize absentee ballots when, in the opinion of the board, it is in the best interest of the credit union and its membership.

a. The secretary shall include with the notice of balloting a statement that members may vote either in person at the meeting of members or by absentee ballot if the member submits a written or electronic request for an absentee ballot and returns the ballot prior to the close of balloting for ballots submitted other than in person during voting at a meeting held for the purpose of voting.

b. The secretary shall mail the balloting materials specified in paragraph 12.11(5)“a” to each member who is eligible to vote and who has submitted a written or electronic request for an absentee ballot.

c. Ballots mailed to the election committee or hand-delivered to the credit union shall be received unopened and deposited in ballot boxes. The ballot boxes shall be opened by and the vote tallied by the election committee, the tallies placed in the ballot boxes, and the ballot boxes resealed to be taken to the meeting.

d. At the meeting of members, printed ballots shall be given to those members who have not voted. The completed ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee before the meeting. After the members have been given an opportunity to vote, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of absentee ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.11(8) *In-person vote at meeting.* If the board voted by majority vote to conduct the vote in whole or in part at a meeting of members, then printed ballots shall be distributed to those in attendance at the meeting who have not voted by another method, and the ballots shall be deposited in ballot boxes placed in conspicuous locations by the election committee. After those members have been given an opportunity to vote at the meeting, balloting shall be closed, the ballot boxes opened and the vote tallied by the election committee and added to any previous count of mailed or electronic ballots. The election committee shall immediately certify the vote count to the board. The chairperson of the election committee shall announce the result of the vote at the meeting.

12.11(9) *Preservation of ballots.* Ballots shall be preserved according to the requirements of 189—12.9(533). The 60-day retention period required by subrule 12.9(2) shall run from the date the results are certified to the board by the election committee.

12.11(10) *Submission to superintendent.* The board of directors shall submit the plan to the superintendent for approval before the plan to sell all of the assets of the corporate central credit union becomes effective. The board shall submit the following documentation in support of its request for approval:

a. A certified copy of the board minutes which contain the vote of the board of directors to approve the plan and to submit the sale to a vote of the membership.

b. A certified copy of the notices provided to members.

c. A certified copy of any ballots provided to members.

d. A certified statement, including the vote count, that a majority of the eligible members voted in favor of the proposed sale.

12.11(11) *Publication of results.* The board shall inform the membership of the results of the vote within ten days of certification of the results of the vote by the election committee. The board shall communicate the results to the membership by at least two of the following methods:

a. By mail.

b. By email.

c. By posting a notice on the corporate central credit union’s website.

[ARC 0938C, IAB 8/7/13, effective 9/15/13]

189—12.12(533) *Vote on conversion of an Iowa-chartered credit union to another charter type.* An Iowa-chartered credit union that seeks to convert to another charter type shall comply with the conversion procedures, including a vote of the membership, as provided in 189—Chapter 3.

These rules are intended to implement Iowa Code sections 533.201, 533.203, 533.203A, 533.204, 533.208, 533.213, 533.401, 533.403, and 533.405.

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CHAPTER 17
INVESTMENT AND DEPOSIT ACTIVITIES FOR CREDIT UNIONS

189—17.1(533) Authority and purpose.

17.1(1) These rules implement the authority of credit unions organized in accordance with Iowa Code chapter 533 to engage in investment and deposit activities which would be permitted if the credit union were federally chartered in accordance with Iowa Code sections 533.301(5) “j” and 533.301(25), and are promulgated under the authority of Iowa Code section 533.104.

17.1(2) These rules identify certain investments and deposit activities permissible under the Federal Credit Union Act, 12 U.S.C. Section 1757, and National Credit Union Administration (NCUA) rules and regulations, 12 CFR Part 703, and prescribe the rules governing those investments and deposit activities on the basis of safety and soundness concerns. Additionally, these rules identify and prohibit certain investments and deposit activities, which may or may not be permitted for federal credit unions and which are considered inconsistent with state law or unsafe or unsound investment for Iowa state-chartered credit unions. Finally, these rules address investment authority granted to Iowa state-chartered credit unions in Iowa Code chapter 533, which may or may not be permitted for federal credit unions.

17.1(3) Exceptions. These rules do not apply to:

- a. Investment in loans to members and other activities pursuant to Iowa Code sections 533.301(2), 533.301(3), 533.301(15) and 533.301(16);
- b. Investment in real estate-secured loans to members pursuant to Iowa Code section 533.315(4);
- c. Investment in credit union service organizations pursuant to Iowa Code section 533.301(5) “f”;
- d. Investment in fixed assets pursuant to Iowa Code section 533.301(10).

189—17.2(533) Definitions. The definition of terms included in Iowa Code section 17A.2 and 189—1.1(533) applies to such terms used in this chapter unless otherwise provided in this rule. In addition, the following definitions apply as used in these rules:

“Adjusted trading” means selling an investment to a counterparty at a price above its current fair value and simultaneously purchasing or committing to purchase from the counterparty another investment at a price above its current fair value.

“Associated personnel” means a person engaged in the investment banking or securities business who is directly or indirectly controlled by a National Association of Securities Dealers (NASD) member, whether or not the person is registered or exempt from registration with NASD. “Associated personnel” includes every sole proprietor, partner, officer, director, or branch manager of any NASD member.

“Banker’s acceptance” means a time draft that is drawn on and accepted by a bank and that represents an irrevocable obligation of the bank.

“Bank note” means a direct, unconditional, and unsecured general obligation of a bank that ranks equally with all other senior unsecured indebtedness of the bank, except deposit liabilities and other obligations that are subject to any priorities or preferences.

“Borrowing repurchase transaction” means a transaction in which the credit union agrees to sell a security to a counterparty and to repurchase the same or an identical security from that counterparty at a specified future date and at a specified price.

“Call” means an option that gives the holder the right to buy a specified quantity of a security at a specified price during a fixed time period.

“Collateralized mortgage obligation” means a multiclass mortgage-related security.

“Collective investment fund” means a fund maintained by a national bank under Comptroller of the Currency regulations, 12 CFR Part 9.

“Commercial mortgage-related security” means a mortgage-related security, as defined in this rule, except that it is collateralized entirely by commercial real estate, such as a warehouse or office building, or a multifamily dwelling consisting of more than four units.

“Commercial paper” means a debt obligation of a United States-chartered corporation with a maturity date of 270 days or less, which may be interest-bearing or discount-purchased.

“*Corporate bonds*” means a debt obligation of a United States-chartered corporation with a maturity date greater than 270 days, which may be interest-bearing or discount-purchased.

“*Counterparty*” means the party on the other side of the transaction.

“*Custodial agreement*” means a contract in which one party agrees to hold securities in safekeeping for others.

“*Delivery versus payment*” means payment for an investment must occur simultaneously with its delivery.

“*Deposit note*” means an obligation of a bank that is similar to a certificate of deposit but is rated.

“*Derivatives*” means any derivative instrument, as defined under generally accepted accounting principles (GAAP).

“*Embedded option*” means a characteristic of an investment that gives the issuer or holder the right to alter the level and timing of the cash flows of the investment. Embedded options include call and put provisions and interest rate caps and floors. Since a prepayment option in a mortgage is a type of call provision, a mortgage-backed security composed of mortgages that may be prepaid is an example of an investment with an embedded option.

“*Eurodollar deposit*” means a U.S. dollar-denominated deposit in a foreign branch of a United States depository institution.

“*European financial options contract*” means an option that can be exercised only on its expiration date.

“*Exchangeable collateralized mortgage obligation*” means a class of a collateralized mortgage obligation (CMO) that, at the time of purchase, represents beneficial ownership interests in a combination of two or more underlying classes of the same CMO structure. The holder of an exchangeable CMO may pay a fee and take delivery of the underlying classes of the CMO.

“*Fair value*” means the amount at which an instrument could be exchanged in a current, arm’s-length transaction between willing parties, as opposed to a forced or liquidation sale.

“*Financial options contract*” means an agreement to make or take delivery of a standardized financial instrument upon demand by the holder of the contract as specified in the agreement.

“*Immediate family member*” means a spouse or other family member living in the same household.

“*Industry-recognized information provider*” means an organization that obtains compensation by providing information to investors and receives no compensation for the purchase or sale of investments.

“*Investment*” means any security, obligation, account, deposit, or other item authorized for purchase by a federal credit union under the Federal Credit Union Act, 12 U.S.C. Section 1757(7), 1757(8), or 1757(15), or NCUA rules and regulations, 12 CFR Part 703, other than loans to members and the exceptions specified in 189—subrule 17.1(3).

“*Investment grade*” means the issuer of a security has an adequate capacity to meet the financial commitments under the security for the projected life of the asset or exposure, even under adverse economic conditions. An issuer has an adequate capacity to meet financial commitments if the risk of default by the obligor is low and the full and timely repayment of principal and interest on the security is expected. A credit union may consider any or all of the following factors, to the extent appropriate, with respect to the credit risk of a security: credit spreads; securities-related research; internal or external credit risk assessments; default statistics; inclusion on an index; priorities and enhancements; price, yield, and/or volume; and asset class-specific factors. This list of factors is not meant to be exhaustive or mutually exclusive.

“*Investment portfolio*” means the amount invested by a credit union pursuant to Iowa Code sections 533.301(5), 533.301(25), 533.304 and 533.305, excluding any investment in nonearning assets such as real estate, premises and equipment, the capitalization deposit in the National Credit Union Share Insurance Fund (NCUSIF), and any other investment which does not generate a regular dividend or interest or receive or accrue added value.

“*Investment repurchase transaction*” means a transaction in which an investor agrees to purchase a security from a counterparty and to resell the same or an identical security to that counterparty at a specified future date and at a specified price.

“*Maturity*” means the date the last principal amount of a security is scheduled to come due and does not mean the call date or the weighted average life of a security.

“*Mortgage-related security*” means a security as defined in Section 3(a)(41) of the Securities Exchange Act of 1934 (15 U.S.C. 78c(a)(41)).

“*Mortgage servicing rights*” means a contractual obligation to perform mortgage servicing and the right to receive compensation for performing those services. Mortgage servicing is the administration of a mortgage loan, including collecting monthly payments and fees, providing record-keeping and escrow functions, and, if necessary, curing defaults and foreclosing.

“*Negotiable instrument*” means an instrument that may be freely transferred from the purchaser to another person or entity by delivery, or endorsement and delivery, with full legal title becoming vested in the transferee.

“*Net worth*” means the retained earnings balance of the credit union at quarter end as determined under generally accepted accounting principles and as further defined in NCUA rules and regulations, 12 CFR Part 702.2(f).

“*Official*” means any member of a credit union’s board of directors, credit committee, auditing/supervisory committee, or investment-related committee.

“*Ordinary care*” means the degree of care that an ordinarily prudent and competent person engaged in the same line of business or endeavor should exercise under similar circumstances.

“*Pair-off transaction*” means an investment purchase transaction that is closed or sold on or before the settlement date. In a pair-off transaction, an investor commits to purchase an investment, but then pairs off the purchase with a sale of the same investment on or before the settlement date.

“*Put*” means an option that gives the holder the right to sell a specified quantity of a security at a specified price during a fixed time period.

“*Registered investment company*” means an investment company that is registered with the Securities and Exchange Commission under the Investment Company Act of 1940 (15 U.S.C. 80a). Examples of registered investment companies are mutual funds and unit investment trusts.

“*Regular way settlement*” means delivery of a security from a seller to a buyer within the time frame that the securities industry has established for immediate delivery of that type of security. For example, regular way settlement of a Treasury security includes settlement on the trade date (cash), the business day following the trade date (regular way), and the second business day following the trade date (skip day).

“*Residual interest*” means the remainder cash flows from collateralized mortgage obligations/real estate mortgage investment conduits (CMOs/REMICs), or other mortgage-backed security transaction, after payments due bondholders and trust administrative expenses have been satisfied.

“*Securities lending*” means lending a security to a counterparty, either directly or through an agent, and accepting collateral in return.

“*Security*” means a share, participation, or other interest in property or in an enterprise of the issuer or an obligation of the issuer that:

1. Either is represented by an instrument issued in bearer or registered form or, if not represented by an instrument, is registered in books maintained to record transfers by or on behalf of the issuer;
2. Is of a type commonly dealt in on securities exchanges or markets or, when represented by an instrument, is commonly recognized in any area in which it is issued or dealt in as a medium for investment; and
3. Either is one of a class or series or by its terms is divisible into a class or series of shares, participations, interests, or obligations.

“*Senior management employee*” means a credit union’s chief executive officer (typically this individual holds the title of president or manager), an assistant chief executive officer, and the chief financial officer.

“*Small business-related security*” means a security as defined in Section 3(a)(53) of the Securities Exchange Act of 1934 (15 U.S.C. 78c(a)(53)). This definition does not include Small Business Administration securities permissible under the Federal Credit Union Act, 12 U.S.C. Section 1757(7).

“*Superintendent*” means the superintendent of credit unions appointed by the governor to direct and regulate credit unions pursuant to Iowa Code chapter 533.

“*Weighted average life*” means the weighted average time to the return of a dollar of principal, calculated by multiplying each portion of principal received by the time at which it is expected to be received (based on a reasonable and supportable estimate of that time) and then summing and dividing by the total amount of principal.

“*When-issued trading of securities*” means the buying and selling of securities in the period between the announcement of an offering and the issuance and payment date of the securities.

“*Yankee dollar deposit*” means a deposit in a United States branch of a foreign bank licensed to do business in the state in which it is located, or a deposit in a state-chartered, foreign-controlled bank.

“*Zero coupon investment*” means an investment that makes no periodic interest payments but instead is sold at a discount from its face value. The holder of a zero coupon investment realizes the rate of return through the gradual appreciation of the investment, which is redeemed at face value on a specified maturity date.

[ARC 1678C, IAB 10/15/14, effective 11/19/14]

189—17.3(533) Investment policies. A state-chartered credit union’s board of directors must establish written investment policies consistent with Iowa Code chapter 533, the Federal Credit Union Act, these rules, and other applicable laws and regulations and must review the policies at least annually. These policies may be part of a broader, asset-liability management policy. Written investment policies must address, at a minimum, the following:

17.3(1) The purposes and objectives of the credit union’s investment activities;

17.3(2) The characteristics of the investments the credit union may make, including the issuer, maturity, index, cap, floor, coupon rate, coupon formula, call provision, average life, and interest rate risk;

17.3(3) How the credit union will manage interest rate risk;

17.3(4) How the credit union will manage liquidity risk;

17.3(5) How the credit union will manage credit risk including specifically listing institutions, issuers, and counterparties that may be used, or criteria for the credit union’s selection, and limits on the amounts that may be invested with each;

17.3(6) How the credit union will manage concentration risk, which can result from dealing with a single issuer or related issuers, lack of geographic distribution, holding obligations with similar characteristics like maturities and indexes, holding bonds having the same trustee, and holding securitized loans having the same originator, packager, or guarantor;

17.3(7) Who has investment authority and the extent of that authority. Those with authority must be qualified by education or experience to assess the risk characteristics of investments and investment transactions. Only officials or employees of the credit union may be voting members of an investment-related committee;

17.3(8) The name of the broker-dealer(s) the credit union may use;

17.3(9) The name of the safekeeper(s) the credit union may use;

17.3(10) How the credit union will handle an investment that, after purchase, is outside of board policy or fails a requirement of these rules; and

17.3(11) How the credit union will conduct investment trading activities, if applicable, including addressing:

- a. Who has purchase and sale authority;
- b. Limits on trading account size;
- c. Allocation of cash flow to trading accounts;
- d. Stop loss or sale provisions;
- e. Dollar size limitations of specific types, quantity and maturity to be purchased;
- f. Limits on the length of time an investment may be inventoried in a trading account; and
- g. Internal controls, including segregation of duties.

189—17.4(533) Record keeping and documentation requirements.

17.4(1) All state-chartered credit unions must comply with generally accepted accounting principles (GAAP) applicable to reports or statements required to be filed with the superintendent. This contrasts with only federal credit unions with assets of \$10 million or greater that must comply with GAAP in reports and statements filed with the NCUA.

17.4(2) A credit union must maintain documentation for each investment transaction for as long as it holds the investment and until the documentation has been audited in accordance with Iowa Code section 533.208 or NCUA rules and regulations, 12 CFR Part 701.12, or both, and examined by the superintendent or the NCUA, or both. The documentation should include, where applicable, bids and prices at purchase and sale and for periodic updates, relevant disclosure documents or a description of the security from an industry-recognized information provider, financial data, and tests and reports required by the credit union's investment policy and these rules.

17.4(3) A credit union must maintain documentation that its board of directors used to approve a broker-dealer or a safekeeper for as long as the broker-dealer or safekeeper is approved and until the documentation has been audited in accordance with Iowa Code section 533.208 or NCUA rules and regulations, 12 CFR Part 701.12, or both, and examined by the superintendent or the NCUA, or both.

17.4(4) A credit union must obtain an individual confirmation statement from each broker-dealer for each investment purchased or sold.

189—17.5(533) Discretionary control over investments and investment advisers.

17.5(1) Except as provided in 17.5(2), 17.5(3) and 17.5(4), a credit union must retain discretionary control over its purchase and sale of investments. A credit union has not delegated discretionary control to an investment adviser when the credit union reviews all recommendations from investment advisers and is required to authorize a recommended purchase or sale transaction before its execution.

17.5(2) A credit union may delegate discretionary control over the purchase and sale of investments to a person other than a credit union official or employee:

a. Provided the person is an investment adviser registered with the Securities and Exchange Commission under the Investment Advisers Act of 1940 (15 U.S.C. 80b); and

b. Provided the amount of investment authority does not exceed 100 percent of the credit union's net worth, in the aggregate, at the time of delegation.

17.5(3) At least annually, the credit union must adjust the amount of funds held under discretionary control to comply with the 100 percent of net worth cap. The credit union's board of directors must receive notice as soon as possible, but no later than the next regularly scheduled monthly board meeting, of the amount exceeding the net worth cap and notify in writing the superintendent within five days after the board meeting. The credit union must develop a plan to comply with the cap within a reasonable period of time.

17.5(4) Before transacting business with an investment adviser, a credit union must analyze the investment adviser's background and information available from state or federal securities regulators, including any enforcement actions against the adviser, associated personnel, or the firm for which the adviser works.

17.5(5) A credit union may not compensate an investment adviser with discretionary control over the purchase and sale of investments on a per-transaction basis or based on capital gains, capital appreciation, net income, performance relative to an index, or any other incentive basis.

17.5(6) A credit union must obtain a report from its investment adviser at least monthly that details the investments under the adviser's control and the investments' performance.

[ARC 1678C, IAB 10/15/14, effective 11/19/14]

189—17.6(533) Credit analysis. A credit union must conduct and document a credit analysis on an investment and the issuing entity before purchasing it, except for investments issued or fully guaranteed as to principal and interest by the U.S. government or its agencies, enterprises, or corporations or fully insured (including accumulated interest) by the National Credit Union Administration or the Federal

Deposit Insurance Corporation. A credit union must update this analysis at least annually for as long as it holds the investment.

189—17.7(533) Notice of noncompliant investments. A credit union's board of directors must receive notice, no later than the next regularly scheduled monthly board meeting, of any investment that either is outside of board policy after purchase or has failed a requirement of these rules. The board of directors must document its action regarding the investment in the minutes of the board meeting, including a detailed explanation of any decision not to sell the investment. The credit union must notify the superintendent in writing of an investment that has failed a requirement of these rules within five days after the board meeting.

189—17.8(533) Broker-dealers.

17.8(1) A credit union may purchase and sell investments through a broker-dealer as long as the broker-dealer is registered as a broker-dealer with the Securities and Exchange Commission under the Securities Exchange Act of 1934 (15 U.S.C. 78a, et seq.) or is a depository institution whose broker-dealer activities are regulated by a federal or state regulatory agency.

17.8(2) Before purchasing an investment through a broker-dealer, a credit union must analyze and annually update the following:

- a.* The background of any sales representative with whom the credit union is doing business;
- b.* Information available from state or federal securities regulators and securities industry self-regulatory organizations, such as the National Association of Securities Dealers and the North American Securities Administrators Association, about any enforcement actions against the broker-dealer, its affiliates, or associated personnel; and
- c.* If the broker-dealer is acting as the credit union's counterparty, the ability of the broker-dealer and its subsidiaries or affiliates to fulfill commitments, as evidenced by capital strength, liquidity, and operating results. The credit union should consider current financial data, annual reports, external assessments of creditworthiness, relevant disclosure documents, and other sources of financial information.

17.8(3) The requirements of 17.8(1) do not apply when the credit union purchases a certificate of deposit or share certificate directly from a bank, credit union, or other depository institution.
[ARC 1678C, IAB 10/15/14, effective 11/19/14]

189—17.9(533) Safekeeping of investments.

17.9(1) A credit union's purchased investments and repurchase collateral must be in the credit union's possession, recorded as owned by the credit union through the Federal Reserve Book Entry System, or held by a board of directors-approved safekeeper under a written custodial agreement that requires the safekeeper to exercise, at least, ordinary care.

17.9(2) Any safekeeper used by a credit union must be regulated and supervised by either the Securities and Exchange Commission, a federal or state depository institution regulatory agency, or a state trust company regulatory agency.

17.9(3) A credit union must obtain and reconcile monthly a statement of purchased investments and repurchase collateral held in safekeeping.

17.9(4) Annually, the credit union must analyze the ability of the safekeeper to fulfill the safekeeper's custodial responsibilities, as evidenced by capital strength, liquidity, and operating results. The credit union should consider current financial data, annual reports, external assessments of creditworthiness, relevant disclosure documents, and other sources of financial information.

[ARC 1678C, IAB 10/15/14, effective 11/19/14]

189—17.10(533) Monitoring nonsecurity investments.

17.10(1) At least quarterly, a credit union must prepare a written report listing all of its shares and deposits in banks, credit unions, and other depository institutions, that have one or more of the following features:

- a.* Embedded options;

- b. Remaining maturities greater than three years; or
- c. Coupon formulas that are related to more than one index or are inversely related to, or are multiples of, an index.

17.10(2) The requirement of 17.10(1) does not apply to shares and deposits that are securities.

17.10(3) If a credit union does not have an investment-related committee, then each member of its board of directors must receive a copy of the report described in 17.10(1). If a credit union has an investment-related committee, then each member of the committee must receive a copy of the report, and each board member must receive a summary of the information in the report.

189—17.11(533) Valuing securities.

17.11(1) Before purchasing or selling a security, a credit union must obtain either price quotations on the security from at least two broker-dealers or a price quotation on the security from an industry-recognized information provider. This requirement to obtain price quotations does not apply to new issues purchased at par or at original issue discount.

17.11(2) At least monthly, a credit union must determine the fair value of each security it holds. It may determine fair value by obtaining a price quotation on the security from an industry-recognized information provider, a broker-dealer, or a safekeeper.

17.11(3) At least annually, the credit union's auditing/supervisory committee or its external auditor must independently assess the reliability of monthly price quotations received from a broker-dealer or safekeeper. The credit union's auditing/supervisory committee or external auditor must follow generally accepted auditing standards, which require either recomputation or reference to market quotations.

17.11(4) If a credit union is unable to obtain a price quotation required by this rule for a particular security, then it may obtain a quotation for a security with substantially similar characteristics.

189—17.12(533) Monitoring securities.

17.12(1) At least monthly, a credit union must prepare a written report setting forth, for each security held, the fair value and dollar change since the prior month end, with summary information for the entire portfolio.

17.12(2) At least quarterly, a credit union must prepare a written report setting forth the sum of the fair values of all fixed and variable rate securities held that have one or more of the following features:

- a. Embedded options;
- b. Remaining maturities greater than three years; or
- c. Coupon formulas that are related to more than one index or are inversely related to, or are multiples of, an index.

17.12(3) When the amount calculated in 17.12(2) is greater than a credit union's net worth, the report described in that subrule must provide a reasonable and supportable estimate of the potential impact, in percentage and dollar terms, of an immediate and sustained parallel shift in market interest rates of plus and minus 300 basis points on:

- a. The fair value of each security in the credit union's portfolio;
- b. The fair value of the credit union's portfolio as a whole; and
- c. The credit union's net worth.

17.12(4) If the credit union does not have an investment-related committee, then each member of its board of directors must receive a copy of the reports described in 17.12(1) through 17.12(3). If the credit union has an investment-related committee, then each member of the committee must receive copies of the reports, and each member of the board of directors must receive a summary of the information in the reports.

189—17.13(533) Permissible investment activities.

17.13(1) *Regular way settlement and delivery versus payment basis.* A credit union may only contract for the purchase or sale of a security as long as the delivery of the security is by regular way settlement and the transaction is accomplished on a delivery versus payment basis.

17.13(2) Federal funds. A credit union may sell federal funds to a national bank; or to a state bank, trust company or mutual savings bank operating in accordance with Iowa law or the laws of any state where it operates a credit union office; or in banks and institutions, the accounts of which are insured by the Federal Deposit Insurance Corporation; or to credit unions, the accounts of which are insured by the National Credit Union Administration; and as long as the interest or other consideration received from the financial institution is at the market rate for federal funds transactions.

17.13(3) Investment repurchase transaction. A credit union may enter into an investment repurchase transaction so long as:

a. Any securities the credit union receives are permissible investments for federal and Iowa credit unions; the credit union, or its agent, either takes physical possession or control of the repurchase securities or is recorded as owner of them through the Federal Reserve Book Entry Securities Transfer System; the credit union, or its agent, receives a daily assessment of the securities' market value, including accrued interest; and the credit union maintains adequate margins that reflect a risk assessment of the securities and the term of the transaction; and

b. The credit union has entered into signed contracts with all approved counterparties.

17.13(4) Borrowing repurchase transaction. A credit union may enter into a borrowing repurchase transaction so long as:

a. The transaction meets the requirements of 17.13(3);

b. Any cash the credit union receives, when aggregated with all other credit union borrowings, is subject to the borrowing limit in accordance with Iowa Code section 533.306 or to any lesser amount specified by policy of the board of directors, and any investments the credit union purchases with that cash are permissible for federal credit unions; and

c. The investments referenced in 17.13(4) "b" mature no later than the maturity of the borrowing repurchase transaction.

17.13(5) Securities lending transaction. A credit union may enter into a securities lending transaction so long as:

a. The credit union receives written confirmation of the loan;

b. Any collateral the credit union receives is a legal investment for federal credit unions; the credit union, or its agent, obtains a first priority security interest in the collateral by taking physical possession or control of the collateral, or is recorded as owner of the collateral through the Federal Reserve Book Entry Securities Transfer System; and the credit union, or its agent, receives a daily assessment of the market value of the collateral, including accrued interest; and maintains adequate margin that reflects a risk assessment of the collateral and the term of the loan;

c. Any cash the credit union receives, when aggregated with all other credit union borrowings, is subject to the borrowing limit in accordance with Iowa Code section 533.306 or to any lesser amount specified by policy of the board of directors, and any investments the credit union purchases with that cash are permissible for federal credit unions and mature no later than the maturity of the transaction; and

d. The credit union has executed a written loan and security agreement with the borrower.

17.13(6) Trading securities.

a. A credit union may trade securities, including engaging in when-issued trading and pair-off transactions, so long as the credit union can show that it has sufficient resources, knowledge, systems, and procedures to handle the risks.

b. A credit union must record any security it purchases or sells for trading purposes at fair value on the trade date. The trade date is the date the credit union commits, orally or in writing, to purchase or sell a security.

c. At least monthly, the credit union must give its board of directors or investment-related committee a written report listing all purchase and sale transactions of trading securities and the resulting gain or loss on an individual basis.

189—17.14(533) Permissible investments.

17.14(1) Variable rate investment. A credit union may invest in a variable rate investment, as long as the index is tied to domestic interest rates. Except in the case of U.S. Treasury inflation-protected securities, the variable rate investment cannot, for example, be tied to foreign currencies, foreign interest rates, domestic or foreign commodity prices, equity prices, or inflation rates. For purposes of this subrule, the U.S. dollar-denominated London Interbank Offered Rate (LIBOR) is a domestic interest rate.

17.14(2) Corporate credit union shares or deposits. A credit union may purchase shares or deposits in a corporate credit union, except when the superintendent or the NCUA has notified it that the corporate credit union is not operating in compliance with NCUA rules and regulations, 12 CFR Part 704. A credit union's aggregate amount of paid-in capital and membership capital, as defined in NCUA rules and regulations, 12 CFR Part 704, in one corporate credit union is limited to 2 percent of its assets measured at the time of investment or adjustment. A credit union's aggregate amount of paid-in capital and membership capital in all corporate credit unions is limited to 4 percent of its assets measured at the time of investment or adjustment.

17.14(3) Registered investment company. A credit union may invest in a registered investment company or collective investment fund, as long as the prospectus of the company or fund restricts the investment portfolio to investments and investment transactions that are permissible for federal credit unions.

17.14(4) Collateralized mortgage obligation/real estate mortgage investment conduit. A credit union may invest in a fixed or variable rate collateralized mortgage obligation/real estate mortgage investment conduit.

17.14(5) Municipal security. A credit union may purchase and hold a municipal security, as defined in the Federal Credit Union Act, 12 U.S.C. Section 1757(7)(K), only if the credit union conducts and documents an analysis that reasonably concludes the security is at least investment grade. The credit union must also limit its aggregate municipal securities holdings to no more than 75 percent of the credit union's net worth and limit its holdings of municipal securities issued by any single issuer to no more than 25 percent of the credit union's net worth.

17.14(6) Instruments issued by institutions described in the Federal Credit Union Act, 12 U.S.C. Section 1757(8). A credit union may invest in the following instruments issued by an institution described in Section 1757(8) of the Federal Credit Union Act:

- a. Yankee dollar deposits;
- b. Eurodollar deposits;
- c. Banker's acceptances;
- d. Deposit notes; and
- e. Bank notes with weighted average maturities of less than five years.

17.14(7) European financial options contract. A credit union may purchase a European financial options contract or a series of European financial options contracts only to fund the payment of dividends on member share certificates or interest on member certificates of deposit when such dividend or interest rate is tied to an equity index provided:

- a. The option and dividend/interest rate are based on a domestic equity index;
- b. Proceeds from the options are used only to fund dividends/interest on the equity-linked certificates;
- c. Dividends or interest, or both, on the certificates are derived solely from the change in the domestic equity index over a specified period;
- d. The options' expiration dates are no later than the maturity date of the certificate;
- e. The certificate may be redeemed prior to the maturity date only upon the member's death or termination of the corresponding option;

- f.* The total costs associated with the purchase of the option is known by the credit union prior to effecting the transaction;
- g.* The options are purchased at the same time the certificate is issued to the member;
- h.* The counterparty to the transaction is a domestic counterparty and has been approved by the credit union's board of directors;
- i.* The counterparty to the transaction meets the minimum credit quality standards as approved by the credit union's board of directors;
- j.* Any collateral posted by the counterparty is a permissible investment for federal credit unions and is valued daily by an independent third party along with the value of the option;
- k.* The aggregate amount of equity-linked member share certificates does not exceed 50 percent of the credit union's net worth;
- l.* The terms of the certificate include a guarantee that there can be no loss of principal to the member regardless of changes in the value of the option unless the certificate is redeemed prior to maturity; and
- m.* The credit union provides its board of directors with a monthly report detailing, at a minimum:
 - (1) The dollar amount of outstanding equity-linked certificates;
 - (2) The certificates' maturities; and
 - (3) The fair value of the options as determined by an independent third party.

17.14(8) Debt obligations of U.S.-chartered corporations. An Iowa state-chartered credit union may invest in unsecured notes and acceptances, commonly referred to as "commercial paper" and "corporate bonds," of U.S.-chartered corporations pursuant to Iowa Code section 533.301(5) "h" and "i" and this rule, only if:

- a.* The investment in a corporate bond debt obligation is investment grade and has a maturity of less than five years;
- b.* The investment in a commercial paper debt obligation is investment grade and has a maturity of less than one year;
- c.* An investment in a nonrated equivalent value issue of a commercial paper debt obligation shall be investment grade. A credit union shall retain documentation supporting its determination and the current and previous two years of year-end financial statements which indicate acceptable operating performance of the issuing U.S. corporation;
- d.* If, subsequent to the date of purchase but prior to the date of maturity, the investment no longer meets the investment grade standard and the investment exceeds the credit union's net worth by 5 percent or more, the credit union shall have no more than 30 days to divest of the security unless the credit union seeks and receives a waiver from the superintendent as provided by rule;
- e.* The total investment by a credit union in debt obligations in a lone U.S. corporation and its subsidiaries shall not exceed 25 percent of the credit union's net worth;
- f.* The total aggregate investment by a credit union in debt obligations of U.S. corporations and their subsidiaries shall not exceed the lesser of 100 percent of the credit union's net worth or 20 percent of the credit union's investment portfolio;
- g.* An investment will be considered speculative and unauthorized if it contains any of the following characteristics, and the credit union shall be required to divest of the security in accordance with 17.14(8) "d" without an opportunity of waiver:
 - (1) It is issued by a business entity not recognized in the market place or by other than a U.S.-chartered corporation, or by both;
 - (2) It has a maturity that exceeds that established in this subrule; or
 - (3) It is issued to cover or underwrite foreign market operations, or for new-line products or services, or both, which exceed 25 percent of the investment offering;
- h.* If the net worth level of a credit union falls or remains below an amount which causes the limitations of this subrule to be exceeded for two consecutive quarters and the amount of difference is 5 percent or more of the net worth, the credit union shall divest of a sufficient amount of debt obligations so the credit union no longer exceeds the limitations or seek a waiver from the superintendent as provided by rule;

i. A corporate credit union chartered in accordance with Iowa Code chapter 533 is exempt from the provisions and limitations of this subrule and, instead, shall have the powers, restrictions and obligations contained in NCUA rules and regulations, 12 CFR Part 704, for federally insured corporate credit unions.

17.14(9) Mortgage note repurchase transactions. A credit union may invest in securities that are offered and sold pursuant to Section 4(5) of the Securities Act of 1933, 15 U.S.C. 77d(5), only as a part of an investment repurchase agreement under subrule 17.13(3), subject to all of the following conditions:

a. The aggregate of the investments with any one counterparty is limited to 25 percent of the credit union's net worth and 50 percent of its net worth with all counterparties.

b. At the time the credit union purchases the securities, the counterparty, or a party fully guaranteeing the counterparty, must meet the minimum credit quality standards as approved by the credit union's board of directors.

c. The credit union must obtain a daily assessment of the market value of the securities under paragraph 17.13(3) "a" using an independent qualified agent.

d. The mortgage note repurchase transaction is limited to a maximum of 90 days.

e. All mortgage note repurchase transactions will be conducted under triparty custodial agreements.

f. A credit union must obtain an undivided interest in the securities.

17.14(10) Zero-coupon investments. A credit union may only purchase a zero-coupon investment with a maturity date that is no greater than ten years from the related settlement date, unless authorized by the superintendent.

17.14(11) Commercial mortgage-related security (CMRS). A credit union may purchase a CMRS that would be a permissible investment for a federal credit union under 12 U.S.C. Section 1756(7)(E) or Section 1756(15)(B) subject to all of the following conditions:

a. The credit union conducts and documents a credit analysis that reasonably concludes the CMRS is at least investment grade.

b. The CMRS meets the definition of commercial mortgage security in 189—17.2(533).

c. The CMRS's underlying pool of loans contains more than 50 loans with no one loan representing more than 10 percent of the pool.

d. The aggregate amount of private label CMRS purchased by the credit union does not exceed 25 percent of its net worth, unless otherwise authorized by the superintendent.

17.14(12) Charitable donation accounts. An Iowa-chartered credit union may apply to the superintendent for authorization to fund a charitable donation account (CDA) as approved by the National Credit Union Administration. The request to the superintendent should address the items listed in 17.19(2) "a" to "c."

a. If the superintendent grants the request, the CDA must satisfy all of the conditions in 12 CFR 721.3(b)(2)(i) to (vii), including but not limited to the following:

(1) The book value of investments in all CDAs in the aggregate must be limited to 5 percent of a credit union's net worth at all times as measured at every call report.

(2) The assets must be held in a segregated custodial account and be specifically identified as a CDA.

(3) If a trust is chosen as the vehicle for the CDA, the trustee must be regulated by the Office of the Comptroller of the Currency (OCC), the U.S. Securities and Exchange Commission (SEC), another federal regulatory agency, or a state regulatory agency. A regulated trustee or other person or entity that is authorized to make investment decisions for a CDA, other than the credit union itself, must be either a registered investment adviser or regulated by the OCC.

(4) The parties to the CDA, typically the funding credit union and trustee or other manager of the account, must document the terms and conditions controlling the account in a written agreement. The terms of the agreement must be consistent with the federal rule. The credit union's board of directors must adopt written policies governing the creation, funding, and management of the CDA that are consistent with the federal rule, must review the policies annually, and may amend them from time to

time. Charitable contributions and donations can only be made to organizations that are exempt from taxation under Section 501(c)(3) of the Internal Revenue Code.

(5) Credit unions utilizing CDAs are required to distribute 51 percent of the total return on investment to one or more qualified charities no less frequently than every five years.

b. CDAs are investments that carry risk. It is expected that any credit union that makes this type of investment will conduct the necessary due diligence and retain the due diligence documentation for examiner review. The board must also document the investment strategies and risk tolerances and must account for the CDA in accordance with generally accepted accounting principles.

[ARC 1678C, IAB 10/15/14, effective 11/19/14; ARC 3734C, IAB 4/11/18, effective 5/16/18]

189—17.15(533) Prohibited investment activities. A credit union may not engage in adjusted trading or short sales.

189—17.16(533) Prohibited investments.

17.16(1) Derivatives. A credit union may not purchase or sell financial derivatives, such as futures, options, interest rate swaps, or forward rate swaps. This prohibition does not apply to:

a. Any derivatives permitted under NCUA rules and regulations, 12 CFR 701.21(i) and 189—subrule 17.14(7);

b. Embedded options not required under GAAP to be accounted for separately from the host contract; and

c. Interest rate lock commitments or forward sales commitments made in connection with a loan originated by the credit union.

17.16(2) Zero coupon investments. Rescinded IAB 10/15/14, effective 11/19/14.

17.16(3) Mortgage servicing rights. A credit union may not purchase mortgage servicing rights as an investment but may perform mortgage servicing functions as a financial service for a member as long as the mortgage loan is owned by a member.

17.16(4) Commercial mortgage-related security. Rescinded IAB 10/15/14, effective 11/19/14.

17.16(5) Stripped mortgage-backed securities. A credit union may not invest in stripped mortgage-backed securities (SMBS) or securities that represent interests in SMBS except as described in 17.16(5) “a” and “c.”

a. A credit union may invest in and hold exchangeable collateralized mortgage obligations (exchangeable CMOs) representing beneficial ownership interests in one or more interest-only classes of a CMO (IO CMOs) or principal-only classes of a CMO (PO CMOs), but only if:

(1) At the time of purchase, the ratio of the market price to the remaining principal balance is between .8 and 1.2, meaning that the discount or premium of the market price to par must be less than 20 points;

(2) The offering circular or other official information available at the time of purchase indicates that the notional principal on each underlying IO CMO declines at the same rate as the principal on one or more of the underlying non-IO CMOs, and the principal on each underlying PO CMO declines at the same rate as the principal, or notional principal, on one or more of the underlying non-PO CMOs; and

(3) The credit union staff has the expertise dealing with exchangeable CMOs to apply the conditions in 17.16(5) “a”(1) and 17.16(5) “a”(2).

b. A credit union that invests in an exchangeable CMO may exercise the exchange option only if all of the underlying CMOs are permissible investments for that credit union.

c. A credit union may accept an exchangeable CMO representing beneficial ownership interests in one or more IO CMOs or PO CMOs as an asset associated with an investment repurchase transaction or as collateral in a securities lending transaction. When the exchangeable CMO is associated with one of these two transactions, it need not conform to the conditions in 17.16(5) “a”(1) and 17.16(5) “a”(2).

17.16(6) Insurance company annuity product. A credit union may not purchase an insurance company annuity product as an investment of the credit union. However, a credit union, in its capacity as an employer, may establish retirement or defined employee benefit programs, which may include the purchase of an annuity for the specific purpose of funding an employee benefit plan, provided that:

- a.* The plan is usually entirely funded by the credit union and the underlying investments are owned by the credit union;
- b.* There is a direct connection between the purchase of the investment and the employee benefit obligation;
- c.* If an employee leaves the credit union before the specified time, fails to exercise an option or to vest in the plan, dies, or in some manner forfeits the right to the planned benefit, the credit union must take the steps necessary to dispose of any investment(s) not needed to meet an actual or potential obligation under the employee benefit plan; and
- d.* A credit union may, under certain circumstances, hold an otherwise impermissible investment purchased to fund an employee benefit plan after an employee retires or separates from the credit union. For example, when a qualified employee is allowed to exercise an investment option following separation, the investment may be held in order to satisfy this benefit plan provision. In most cases this is an acceptable practice provided the option period is reasonable. Upon the employee's exercise of the option or the expiration of the exercise period, the credit union must divest itself of any remaining impermissible investment(s).

17.16(7) *Other prohibited investments.* A credit union may not purchase residual interests in collateralized mortgage obligations, real estate mortgage investment conduits, or small business-related securities.

[ARC 1678C, IAB 10/15/14, effective 11/19/14]

189—17.17(533) Conflicts of interest.

17.17(1) A credit union's officials and senior management employees, and their immediate family members, may not receive anything of value in connection with their investment transactions. This prohibition also applies to any other employee, such as an investment officer, if the employee is directly involved in investments, unless the credit union's board of directors determines that the employee's involvement does not present a conflict of interest. This prohibition does not include compensation for employees.

17.17(2) A credit union's officials and employees must conduct all transactions with business associates or family members that are not specifically prohibited by 17.17(1) at arm's length and in the credit union's best interest.

189—17.18 Reserved.

189—17.19(533) Investment pilot program.

17.19(1) Under an investment pilot program, the credit union division will permit a limited number of credit unions to engage in investment activities prohibited by this rule but otherwise permitted by the Federal Credit Union Act, 12 U.S.C. Section 1757.

17.19(2) Except as provided in 17.19(4), before a credit union may engage in an additional activity it must obtain written approval from the superintendent. To obtain approval, a credit union must submit its written request to the superintendent that addresses the following items:

- a.* Certification that the credit union is "well-capitalized" under NCUA rules and regulations, 12 CFR Part 702;
- b.* Board policies approving the activities and establishing limits on them;
- c.* A complete description of the activities, with specific examples of how they will benefit the credit union and how they will be conducted;
- d.* A demonstration of how the activities will affect the credit union's financial performance, risk profile, and asset-liability management strategies;
- e.* Examples of reports the credit union will generate to monitor the activities;
- f.* Projections of the associated costs of the activities, including personnel, computer, and audit;
- g.* Descriptions of the internal systems that will measure, monitor, and report the activities;
- h.* Qualifications of the staff and officials responsible for implementing and overseeing the activities; and

i. Internal control procedures that will be implemented, including audit requirements.

17.19(3) If the superintendent supports the credit union's request to engage in the additional activity as provided in 17.19(2), the superintendent will forward the request to the NCUA regional director for review and nonobjection. If the regional director determines that the additional activity would be approved for the credit union if it were federally chartered and does not object otherwise, the superintendent may approve the credit union's request.

17.19(4) Subsequent to the publication date of these rules, a credit union will not need to seek written approval of the superintendent to engage in an investment activity prohibited by the rules but permitted by the Federal Credit Union Act if the activity is part of a third-party investment program the NCUA approves for federal credit unions after the third party submits a request to the NCUA Director of the Office of Strategic Program Support and Planning that addresses the following items:

- a.* A complete description of the activities with specific examples of how a federal credit union will conduct and account for them, and how the activities will benefit a federal credit union;
- b.* A description of any risks to a federal credit union from participating in the program; and
- c.* Contracts that must be executed by the federal credit union.

189—17.20(533) Responsibility placed upon the credit union to show cause.

17.20(1) A state-chartered credit union that engages in an investment activity that it believes to be permissible for federal credit unions, whether or not addressed by these rules, must provide the superintendent, when requested, satisfactory documentation that the activity is not prohibited by the Iowa Code or by the NCUA, or both.

17.20(2) If a credit union engages in an investment activity, whether expressly permitted by these rules or an investment activity that the credit union believes, in good faith, is permitted, and which at the time of engagement is not or thought not to be prohibited by the Iowa Code or the NCUA, or both, but subsequently becomes or is found to have been prohibited, the credit union must develop a plan to become compliant within a reasonable period of time.

17.20(3) Although automatic authority is granted to Iowa credit unions by Iowa Code sections 533.301(5)“j” and 533.301(25) and these rules, such authority may be withheld or withdrawn by the superintendent for safety and soundness concerns or for blatant disregard for these rules, in whole or in part, by a credit union.

189—17.21(533) Director, officer, or employee overdraft. A state credit union may pay an overdraft of a director, officer, or employee of the state credit union on an account at the state credit union when the payment of funds is made in accordance with any of the following:

1. A written, preauthorized, interest-bearing extension of credit plan that specifies a method of repayment.
2. A written, preauthorized transfer of collected funds from another account of the account holder at the state credit union.
3. The overdraft is paid pursuant to an overdraft protection plan or courtesy pay program. Such payment is limited to one time per quarter, and the overdraft shall last no longer than ten days. Each credit union board of directors shall enact a policy regarding failure to comply with the provisions of this rule.

This rule is intended to implement Iowa Code section 533.205(7).
[ARC 3734C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code section 533.301(5).

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[Prior to 10/22/86, see Insurance Department[510], renamed Insurance Division[191] under the “umbrella” of Department of Commerce by the 1986 Iowa Acts, Senate File 2175]

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[Appeared as Ch 17, 1973 IDR]
[Prior to 10/22/86, Insurance Department[510]]

DIVISION I
DEFINITIONS AND ADMINISTRATION

191—50.1(502) Definitions. For the purposes of this chapter, the definitions in Iowa Code chapter 502 and the following definitions shall apply unless the context otherwise requires:

“*Act*” means Iowa Code chapter 502, the Iowa Uniform Securities Act (Blue Sky Law).

“*Administrator*” means the commissioner of insurance or the deputy administrator appointed under Iowa Code section 502.601.

“*CCH NASAA Reports*” means the official statements of policy of the North American Securities Administrators Association, Inc., printed by Commerce Clearing House, the official reporter for NASAA.

“*CRD*” means the Central Registration Depository.

“*CSRU*” means the Iowa child support recovery unit.

“*FDIC*” means the Federal Deposit Insurance Corporation.

“*FINRA*” means the Financial Industry Regulatory Authority.

“*Form ADV*” means Uniform Application for Investment Adviser Registration.

“*Form ADV-E*” means the Certificate of Accounting of Client Securities and Funds in the Possession or Custody of an Investment Adviser.

“*Form ADV-H*” means Notice of Hardship Application for Investment Adviser Registration.

“*Form ADV-W*” means Notice of Withdrawal from Registration as Investment Adviser.

“*Form BD*” means Uniform Application for Broker-Dealer Registration.

“*Form BDW*” means Uniform Request for Broker-Dealer Withdrawal.

“*Form ICP*” means Agricultural Cooperative Notice of Sales of Notes or Evidences of Indebtedness.

“*Form F-7*” means Registration Statement Under the Securities Act of 1933, for registration of securities of certain Canadian issuers offered for cash upon the exercise of rights granted to existing security holders.

“*Form F-8*” means Registration Statement Under the Securities Act of 1933, for registration of securities of certain Canadian issuers to be issued in exchange offers or a business combination.

“*Form F-9*” means Registration Statement Under the Securities Act of 1933, for registration of certain investment grade debt or investment grade preferred securities of certain Canadian issuers.

“*Form F-10*” means Registration Statement Under the Securities Act of 1933, for registration of securities of certain Canadian issuers.

“*Form NF*” means Uniform Investment Company Notice Filing.

“*Form S-1*” means Registration Statement Under the Securities Act of 1933, for registration of securities for which no other form is authorized or prescribed.

“*Form SB-2*” means Registration Statement Under the Securities Act of 1933, for registration of securities to be sold to the public by small business issuers.

“*Form U-1*” means Uniform Application to Register Securities.

“*Form U-2*” means Uniform Consent to Service of Process.

“*Form U-2A*” means Uniform Corporate Resolution.

“*Form U-4*” means Uniform Application for Securities Industry Registration or Transfer.

“*Form U-5*” means Uniform Termination Notice for Securities Industry Registration.

“*Form U-6*” means Uniform Disciplinary Action Reporting Form.

“*Form U-7*” means Small Corporate Offering Registration Form.

“*Form USR-1*” means Investment Company Report of Sales.

“*Gift*” means a rendering of anything of value in return for which legal consideration of equal or greater value is not given and received.

“*IARD*” means the Investment Advisory Registration Depository.

“*Immediate family*” includes parent, mother-in-law, father-in-law, spouse, former spouse, brother, sister, brother-in-law, sister-in-law, son-in-law, daughter-in-law, child and stepchild. In addition, “immediate family” includes any other person who is supported, directly or indirectly, to a material extent by an agent.

“*Investment contract*” as used in Iowa Code section 502.102(28) includes:

1. Any investment in a common enterprise with the expectation of profit to be derived through the essential managerial efforts of someone other than the investor.

(1) “Common enterprise” in this definition means an enterprise in which the fortunes of the investor are tied to the efficacy of the efforts and successes of those seeking the investment or of a third party.

(2) “Profit” in this definition includes income or a return on the investment, including a fixed rate of return, dividends, other periodic payments, or the increased value of the investment; or

2. Any investment by which an offeree furnishes initial value to an offerer, and a portion of this initial value is subjected to the risks of the enterprise, and the furnishing of the initial value is induced by the offerer’s promises or representations which give rise to a reasonable understanding that a valuable benefit of some kind over and above the initial value will accrue to the offeree as a result of the operation of the enterprise, and the offeree does not exercise practical and actual control over the managerial decisions of the enterprise.

“*Loan*” means an agreement to advance property, including but not limited to money, in return for the promise that payment will be made for use of the property.

“*NASAA*” means the North American Securities Administrators Association, Inc.

“*NASDAQ*” means the NASDAQ Stock Market.

“*NCUA*” means the National Credit Union Association.

“*NSMIA*” means the National Securities Markets Improvement Act of 1996, Public Law 104-290.

“*NYSE*” means the New York Stock Exchange.

“*OTC*” means over the counter.

“*PCAOB*” means the Public Company Accounting Oversight Board.

“*SAI*” means Statement of Additional Information.

“*SEC*” means the United States Securities and Exchange Commission as established pursuant to 15 U.S.C. Section 78(d).

“*SOIF*” means Solicitation of Interest Form.

This rule is intended to implement Iowa Code section 502.605(1).

[ARC 9169B, IAB 10/20/10, effective 11/24/10; ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 2175C, IAB 9/30/15, effective 11/4/15]

191—50.2(502) Cost of audit or inspection.

50.2(1) The administrator may assess the broker-dealer or investment adviser for reasonable charges of travel, lodging, and other expenses incurred by Iowa insurance division staff or independent persons conducting an audit or inspection and directly attributable to an audit or inspection made pursuant to Iowa Code section 502.411(4). The assessment of costs of meals, lodging, transportation, and other actual and necessary travel expenses, if any, incurred by persons conducting an audit or inspection shall be determined in accordance with one of the following, as agreed by the administrator and the persons conducting an audit or inspection:

a. The department of administrative services (DAS) state accounting enterprise Accounting Policy and Procedures Manual guidelines for employee travel (das.iowa.gov/state-accounting/sae-policies-procedures-manual) and the DAS form Travel Section Policy and Procedures (das.iowa.gov/state-accounting/travel-relocation) in effect at the time of the audit or inspection.

b. The department of administrative services state accounting enterprise Accounting Policy and Procedures Manual guidelines for travel for in-state board, commission, advisory council, and task force member expenses.

c. The United States General Services Administration Continental United States (“CONUS”) per diem travel allowances for lodging, meals and incidental expenses.

d. A reimbursement schedule as agreed by the administrator and the persons conducting the audit or inspection.

50.2(2) If costs are assessed under subrule 50.2(1), the administrator may, upon completion of the examination, or at such regular intervals prior to completion as the administrator determines, prepare an account of the costs incurred in performing and preparing the report of the examination which shall be charged to and paid by the broker-dealer or investment adviser examined.

50.2(3) The administrator shall notify the broker-dealer or investment adviser of the expenses attributable to the audit or inspection as soon as practicable.

50.2(4) Assessments collected pursuant to this rule shall be paid by the broker-dealer or investment adviser as directed by the administrator either to the administrator or to the persons conducting the audit or inspection. The persons conducting the audit or inspection shall be reimbursed only for the actual and necessary costs incurred in conducting the audit or inspection.

This rule is intended to implement Iowa Code section 502.411(4).

[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 2175C, IAB 9/30/15, effective 11/4/15; ARC 2872C, IAB 12/21/16, effective 1/25/17]

191—50.3(502) Interpretative opinions or no-action letters. Interested persons may request the administrator to issue an interpretative opinion pursuant to Iowa Code section 502.605(4). These requests will be answered by means of a no-action letter. Requests for confirmation of the availability of an exemption shall be answered in the same manner. The following procedure is recommended for the submission of such requests:

50.3(1) The request should be in writing and include the factual situation involved, a citation to the applicable part of the rule or statute, and the question sought to be answered. Any disclosure or informational materials which pertain to the issue should also be filed.

50.3(2) The administrator, or any person delegated under Iowa Code section 502.601(1), may respond to the request by determining to take or not to take a no-action position or by declining to reach a determination due to insufficient facts, conflicting case or administrative law or such other reasons as the administrator’s discretionary power allows.

50.3(3) All no-action determinations shall be based upon the representations made by the requesting party in the letter and information filed, since any different facts or conditions might require a different conclusion. The no-action letter shall express the administrator’s position on enforcement action only and shall not purport to express any legal conclusion on the questions presented. No determination shall take a position on whether or not any disclosure materials satisfactorily comply with the antifraud and civil liability sections of the Act.

50.3(4) A no-action determination issued under this rule may be provided to interested persons for a filing fee of \$100.

This rule is intended to implement Iowa Code section 502.605(4).

[ARC 2872C, IAB 12/21/16, effective 1/25/17]

191—50.4 to 50.9 Reserved.

DIVISION II
REGISTRATION OF BROKER-DEALERS AND AGENTS

191—50.10(502) Broker-dealer registrations, renewals, amendments, succession, and withdrawals.

50.10(1) An applicant for an initial registration to conduct business as a broker-dealer must:

a. File a current Form BD. If the applicant is a member of FINRA, Form BD shall be filed with CRD. If the applicant is not a member of FINRA, Form BD shall be signed and notarized and filed with the administrator; and

b. Pay a \$200 filing fee. If the applicant is a member of FINRA, the fee shall be remitted to the CRD. If the applicant is not a member of FINRA, the fee shall be remitted to the administrator.

50.10(2) No application for initial registration will be deemed complete for purposes of Iowa Code section 502.406(3) until the applicant has been approved as a member of FINRA.

50.10(3) An applicant that is a member of FINRA and that seeks renewal of a broker-dealer registration shall comply with the renewal time frames established by FINRA for renewal on the CRD system and shall:

a. File with CRD an updated Form BD;

b. Pay to the CRD a \$200 renewal filing fee.

50.10(4) An applicant that is not a member of FINRA and that seeks renewal of a broker-dealer registration shall by November 30 of each year:

a. File with the administrator an updated Form BD, manually signed and notarized;

b. File with the administrator the renewal applicant's most recent audited financial statements if they were not previously submitted to the administrator pursuant to subrule 50.10(1);

c. Pay a \$200 renewal filing fee, which shall be remitted to the administrator.

50.10(5) Failure to comply with the requirements of subrule 50.10(3) or 50.10(4) shall be deemed a request for withdrawal of the broker-dealer registration, and the registration will be terminated as of December 31 of the renewal year.

50.10(6) A registered broker-dealer that is a FINRA member shall submit a withdrawal request by filing an accurate and complete Form BDW with CRD. A registered broker-dealer that is not a FINRA member shall submit a withdrawal request by filing an accurate and complete Form BDW with the administrator.

50.10(7) For purposes of Iowa Code section 502.406(2), a correcting amendment to the information or a record contained in either an initial or renewal application shall be considered to be filed "promptly" with the administrator if filed within 30 days of the event necessitating the correcting amendment.

50.10(8) Succession and change in registration.

a. In the case of an organizational change, including a change in the state of incorporation or form of organization, not involving a material change in financial condition or management, a broker-dealer shall file all applicable amendments to Form BD.

b. In the case of an organizational change, including a change in the state of incorporation or form of organization, involving a material change in financial condition or management, a broker-dealer shall file a new application for registration pursuant to subrule 50.10(1). The filing must include the fee pursuant to paragraph 50.10(1)"*c*" and registration fees for all Iowa-registered agents.

c. In the case of a change in name, a broker-dealer shall file all applicable amendments to Form BD.

50.10(9) Upon the administrator's oral or written request, a broker-dealer shall provide to the administrator the broker-dealer's most recent financial reports, audited or unaudited, within two business days of the request. A broker-dealer may utilize express mail delivery or transmission via electronic means to comply with a request pursuant to this subrule. Financial reports not received by the filing deadline are subject to a late fee of \$50 per day beyond the filing deadline, not to exceed an aggregate penalty of \$500. Imposition of the late fee is not a reportable event. In the event of the broker-dealer's continued noncompliance, the administrator may also pursue sanctions authorized by Iowa Code section 502.412.

50.10(10) Registration exemption for merger and acquisition brokers.

a. Definitions. For purposes of rule 191—50.10(502), in addition to the definitions set forth in rule 191—50.1(502), the following definitions apply:

(1) "*Control*" means the power, directly or indirectly, to direct the management or policies of a company, whether through ownership of securities, by contract or otherwise. There is a presumption of control for any person who meets at least one of the following conditions:

1. Is a director, general partner, member, or manager of a limited liability company, or officer exercising executive responsibility (or similar status or functions).

2. Has the right to vote 20 percent or more of a class of voting securities or the power to sell or direct the sale of 20 percent or more of a class of voting securities.

3. In the case of a partnership or limited liability company, has the right to receive upon dissolution, or has contributed, 20 percent or more of the capital.

(2) "*Eligible privately held company*" means a company that meets both of the following conditions:

1. The company does not have any class of securities:

- Registered, or required to be registered, pursuant to the Securities Exchange Act of 1934 (15 U.S.C. Section 781); or

- For which the company files, or is required to file, periodic information, documents, and reports pursuant to the Securities Exchange Act of 1934 (15 U.S.C. Section 78o(d)).

2. In the fiscal year ending immediately before the fiscal year in which the services of the merger and acquisition broker are initially engaged with respect to the securities transaction, the company meets either or both of the following conditions (determined in accordance with the historical financial accounting records of the company):

- The earnings of the company before interest, taxes, depreciation, and amortization are less than \$25 million.

- The gross revenues of the company are less than \$250 million.

(3) "*Merger and acquisition broker*" means any broker-dealer and any person that is associated with a broker-dealer:

1. That is engaged in the business of effecting securities transactions solely in connection with the transfer of ownership of an eligible privately held company; and

- That is thus engaged regardless of whether that broker-dealer acts on behalf of a seller or buyer; and

- That is thus engaged through the purchase, sale, exchange, issuance, repurchase, or redemption of, or a business combination involving, securities or assets of the eligible privately held company; and

2. That meets both of the following conditions:

- The broker-dealer reasonably believes that, upon consummation of the transaction, any person acquiring securities or assets of the eligible privately held company, acting alone or in concert, will control and, directly or indirectly, will be active in the management of the eligible privately held company or the business conducted with the assets of the eligible privately held company; and

- If any person offered securities in exchange for securities or assets of the eligible privately held company, such person will, prior to becoming legally bound to consummate the transaction, receive or have reasonable access to both of the following:

- o The most recent fiscal year-end financial statements of the issuer of the securities as customarily prepared by its management in the normal course of operations; and

- o If the financial statements of the issuer are audited, reviewed or compiled, all of the following:

- ◆ Any related statement by the independent accountant;

- ◆ A balance sheet dated not more than 120 days before the date of the exchange offer;

- ◆ Information pertaining to the management, business, and results of operations for the period covered by the foregoing financial statements; and

- ◆ Any material loss contingencies of the issuer.

(4) "*Public shell company*" means a company that, at the time of a transaction with an eligible privately held company, meets all three of the following conditions:

1. Has any class of securities registered, or required to be registered, with the SEC pursuant to the Securities Exchange Act of 1934 (15 U.S.C. Section 781), or with respect to which the company files, or is required to file, periodic information, documents, and reports pursuant to the Securities Exchange Act of 1934 (15 U.S.C. 78o(d)).

2. Has no or nominal operations.

3. Has assets consisting of one of the following:

- No or nominal assets.
- Cash and cash equivalents.
- Any amount of cash and cash equivalents and nominal other assets.

b. Merger and acquisition broker exemption from registration requirements.

(1) Exemption. Except as provided in subparagraphs 50.10(10)“b”(2) and (3), a merger and acquisition broker is exempt from the broker-dealer registration requirements and procedures of Iowa Code sections 502.401 and 502.406.

(2) Activities not exempt. A merger and acquisition broker is not exempt from the broker-dealer registration requirements of Iowa Code sections 502.401 and 502.406 if the merger and acquisition broker does any of the following:

1. Directly or indirectly, in connection with the transfer of ownership of an eligible privately held company, receives, holds, transmits, or has custody of the funds or securities to be exchanged by the parties to the transaction.

2. Engages on behalf of an issuer in a public offering of any class of securities that is registered, or is required to be registered, with the SEC under the Securities Exchange Act of 1934 (15 U.S.C. Section 781) or with respect to which the issuer files, or is required to file, periodic information, documents, and reports under the Securities Exchange Act of 1934 (15 U.S.C. Section 78o(d)).

3. Engages on behalf of any party in a transaction involving a public shell company.

(3) Disqualifications. A merger and acquisition broker is not exempt from registration under this subrule if the merger and acquisition broker is subject to any of the following:

1. Suspension or revocation of registration under the Securities Exchange Act of 1934 (15 U.S.C. Section 78o(b)(4));

2. A statutory disqualification described in the Securities Exchange Act of 1934 (15 U.S.C. Section 78c(a)(39));

3. A disqualification under the rules adopted by the SEC pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act (15 U.S.C. Section 77d note)); or

4. A final order described in the Securities Exchange Act of 1934 (15 U.S.C. Section 78o(b)(4)(H)).

(4) Rule of construction. Nothing in this subrule shall be construed to limit any other authority of the administrator to exempt any person, or any class of persons, from Iowa Code chapter 502 or from any provision of this chapter.

c. Inflation adjustment. On July 1, 2023, and every five years thereafter, each dollar amount in 50.10(10)“a”(2)“2” shall be adjusted by the following calculation, and the dollar amount determined under the calculation shall be rounded to the nearest multiple of \$100,000:

(1) Dividing the annual value of the Employment Cost Index for Wages and Salaries, Private Industry Workers (or any successor index), as published by the Bureau of Labor Statistics, for the calendar year preceding the calendar year in which the adjustment is being made by the annual value of such index (or successor index) for the calendar year ending December 31, 2017; and

(2) Multiplying the dollar amount in 50.10(10)“a”(2)“2” by the quotient obtained under subparagraph 50.10(10)“c”(1), above.

This rule is intended to implement Iowa Code section 502.411(2).

[ARC 9169B, IAB 10/20/10, effective 11/24/10; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.11(502) Principals. Every registered broker-dealer shall have at least two officers or partners registered with FINRA as principals, appropriate to the function(s) to be performed.

This rule is intended to implement Iowa Code section 502.406.

[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.12(502) Agent and issuer registrations, renewals and amendments.

50.12(1) Agent registration. Every applicant for registration as an agent of a broker-dealer shall:

a. Pass the Uniform Securities Agent State Law Examination (Series 63) or the Uniform Combined State Law Examination (Series 66);

b. Pass the appropriate qualifying examination administered by FINRA. In the event that an applicant for registration as an agent has received a waiver by FINRA of a FINRA examination otherwise required by this paragraph, the FINRA waiver will be accepted in lieu of the examination requirement;

c. File an accurate and complete Form U-4 with CRD; and

d. Pay a \$40 filing fee to FINRA if applying for registration as an agent of a FINRA member broker-dealer, or to the administrator if applying for registration as an agent of a non-FINRA member broker-dealer.

50.12(2) Any individual who is out of the business of effecting transactions in securities for less than two years from the date of filing an application and who has previously passed an examination required in subrule 50.12(1) shall not be required to retake the examination to be eligible to be relicensed upon application.

50.12(3) Renewals, amendments, and withdrawal requests.

a. A registered agent of a FINRA member broker-dealer shall submit all renewals, renewal fees, amendments to Form U-4, and withdrawal requests to CRD. A withdrawal request shall be made by filing an accurate and complete Form U-5 with CRD.

b. A registered agent of a non-FINRA member broker-dealer shall submit all renewals, renewal fees, amendments to Form U-4, and withdrawal requests to the administrator. A withdrawal request shall be made by filing an accurate and complete Form U-5 with the administrator.

50.12(4) An issuer seeking to employ persons as agents of the issuer within the meaning of Iowa Code section 502.102(2) must apply in writing to the administrator for such authority. The application shall include:

a. A statement of the issuer's intent to employ agents for the sale of its securities;

b. The name, address, social security number, and proof of satisfaction of subrule 50.12(1) for each agent;

c. A complete description of the subject securities;

d. A complete and accurate Form U-4; and

e. A \$40 filing fee.

This rule is intended to implement Iowa Code section 502.406.

[ARC 9169B, IAB 10/20/10, effective 11/24/10; ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.13(502) Agent continuing education requirements. Every registered agent shall comply with all applicable continuing education requirements adopted by FINRA, NYSE, or any other self-regulatory agency. Failure to comply with any such requirements may be a basis for discipline pursuant to Iowa Code section 502.412(4) "n."

This rule is intended to implement Iowa Code section 502.411(8).

[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.14(502) Broker-dealer record-keeping requirements.

50.14(1) Unless otherwise provided by an SEC order, each broker-dealer registered or required to be registered under the Act shall make, maintain and preserve books and records in compliance with SEC Rules 17a-3 (17 CFR 240.17a-3), 17a-4 (17 CFR 240.17a-4), 15c2-6 (17 CFR 240.15c2-6) and 15c2-11 (17 CFR 240.15c2-11).

50.14(2) To the extent that the SEC amends the above-referenced rules, broker-dealers complying with such rules as amended shall not be subject to enforcement action by the administrator for violating this rule to the extent that the violation results solely from the broker-dealer's compliance with the amended rule.

This rule is intended to implement Iowa Code section 502.411(3).

191—50.15(502) Broker-dealer minimum financial requirements and financial reporting requirements.

50.15(1) Each broker-dealer registered or required to be registered under the Act shall comply with SEC Rules 15c3-1 (17 CFR 240.15c3-1), 15c3-2 (17 CFR 240.15c3-2), and 15c3-3 (17 CFR 240.15c3-3).

50.15(2) Each broker-dealer registered or required to be registered under the Act shall comply with SEC Rule 17a-11 (17 CFR 240.17a-11) and shall file with the administrator copies of notices of financial deficiencies, as required under SEC Rule 17a-11 (17 CFR 240.17a-11).

50.15(3) To the extent that the SEC amends the above-referenced rules, broker-dealers complying with such rules as amended shall not be subject to enforcement action by the administrator for violations resulting solely from the broker-dealer's compliance with the amended rules.

This rule is intended to implement Iowa Code section 502.411(2).

191—50.16(502) Dishonest or unethical practices in the securities business.

50.16(1) Dishonest or unethical business practices by any person in the securities business, other than an agent, investment adviser, investment adviser representative, or federal covered investment adviser, as prohibited pursuant to Iowa Code section 502.412(4) "m" include, but are not limited to, the following:

a. Engaging in any unreasonable and unjustifiable delay in delivering securities purchased by any customers or paying, upon request, free credit balances reflecting completed transactions of any customers;

b. Inducing in a customer's account trading which is excessive in size or frequency relative to the financial resources and character of the account;

c. Suitability:

(1) Failing to use reasonable diligence, in regard to the opening and maintenance of every account, to know and retain the essential facts concerning every customer and concerning the authority of each person acting on behalf of such customer;

(2) Recommending a transaction or investment strategy involving a security or securities without a reasonable basis to believe that the transaction or investment strategy is suitable for the customer, based on the information obtained through the reasonable diligence of the member or associated person to ascertain the customer's investment profile. A customer's investment profile includes, but is not limited to, the customer's age, other investments, financial situation and needs, tax status, investment objectives, investment experience, investment time horizon, liquidity needs, risk tolerance, and any other information the customer may disclose to the broker-dealer or agent in connection with such recommendation;

d. Executing a transaction on behalf of a customer without authorization;

e. Exercising any discretionary power in effecting a transaction for a customer's account without first obtaining written discretionary authority from the customer, unless the discretionary power relates solely to the time or price for executing the orders;

f. Executing any transaction in a margin account without securing from the customer a properly executed written margin agreement prior to the initial transaction in the account;

g. Failing to segregate customers' free securities or securities held in safekeeping;

h. Hypothecating a customer's securities without having a lien on them unless the broker-dealer secures from the customer a properly executed written consent promptly after the initial transaction, except as otherwise permitted by SEC rules;

i. Entering into a transaction with or for a customer at a price not reasonably related to the current market price of the security or receiving an unreasonable commission or profit;

j. Failing to furnish on or before the transaction confirmation date a final prospectus, or, if a final prospectus is not available, a preliminary prospectus together with additional documents which include all information that would be set forth in the final prospectus, to a customer purchasing securities in an offering registered pursuant to Iowa Code section 502.303 or 502.304 or that is subject to a notice filing made pursuant to Iowa Code section 502.302. If the offering is not registered, the broker-dealer shall furnish those disclosure documents that are customarily available;

k. Charging unreasonable and inequitable fees for services performed, including miscellaneous services such as collecting moneys due for principal, dividends or interest, exchange or transfer of securities, appraisals, safekeeping, custody of securities or other services regarding the securities business;

l. Offering to buy from or sell to any person any security at a stated price unless the broker-dealer is prepared to purchase or sell the security at the stated price and under the conditions as stated at the time of the offer to buy or sell the security;

m. Representing that a security is being offered to a customer “at the market” or a price relevant to the market price unless the broker-dealer knows or has reasonable grounds to believe that a market for the security exists other than that made, created or controlled by the broker-dealer, or by any person for whom the broker-dealer is acting or with whom the broker-dealer is associated in the distribution, or any person controlled by, controlling or under common control with such broker-dealer;

n. Effecting any transaction in, or inducing the purchase or sale of, any security by any manipulative, deceptive or fraudulent device, practice, plan, program, design or contrivance, including but not limited to:

(1) Effecting any transaction in a security involving no change in the beneficial ownership thereof;

(2) Entertaining an order for the purchase or sale of any security knowing that an order or orders of substantially the same size have been or will be entered by or for the same or different parties at substantially the same time and price for the purpose of creating a false or misleading appearance of active trading in the security or a false or misleading appearance regarding the market for the security. Nothing in this subparagraph shall prohibit a broker-dealer from entering bona fide agency cross transactions for the broker-dealer’s customers;

(3) Effecting, alone or with one or more persons, a series of transactions in any security which creates actual or apparent active trading in a security or raising or depressing the price of the security for the purpose of inducing the purchase or sale of the security by others;

o. Guaranteeing a customer against loss in any securities account of the customer carried by the broker-dealer or in any securities transaction effected by the broker-dealer with or for the customer;

p. Publishing or circulating, or causing to be published or circulated, any notice, circular, advertisement, newspaper article, investment service, or communication of any kind purporting to report any transaction as a purchase or sale of any security unless the broker-dealer believes that the transaction was a bona fide purchase or sale of such security, or purporting to quote the bid price or asked price for any security unless the broker-dealer believes that the quotation represents a bona fide bid for or offer of such security;

q. Using any advertising or sales presentation in a deceptive or misleading fashion including but not limited to a distribution of any nonfactual data, material or presentation based on conjecture, unfounded or unrealistic claims or assertions in any brochure or flyer, or display by words, pictures, graphs or other medium designed to supplement, detract from, supersede or defeat the purpose or effect of any prospectus or disclosure;

r. Failing to disclose that the broker-dealer is controlled by, controlling, affiliated with or under common control of the issuer of any security before entering into any contract with or for a customer for the purchase or sale of the security. The existence of any control or affiliation shall be disclosed to the customer in writing prior to completion of the transaction;

s. Failing to make a bona fide public offering of all of the securities allotted to a broker-dealer for distribution, whether the securities were acquired by the broker-dealer as an underwriter, as a selling group member, or from a member participating in the distribution as an underwriter or selling group member;

t. Failing or refusing to furnish a customer, upon reasonable request, information to which the customer is entitled or to respond to a formal written request or complaint from the customer;

u. Failing or refusing to provide information requested in writing by the administrator within 14 days or a later time as prescribed by the administrator;

v. Extending credit to a customer in violation of the Securities Exchange Act of 1934 or the regulations of the Federal Reserve Board;

- w. Engaging in acts or practices enumerated in rule 191—50.100(502);
- x. Failing in the solicitation of a sale or purchase of an OTC non-NASDAQ security to promptly provide, upon the customer's request, the most current prospectus, the most recent periodic report filed pursuant to Section 13 of the Securities Exchange Act of 1934, or any other available research reports;
- y. Marking any order tickets or confirmations as unsolicited when the transaction is solicited;
- z. Failing to provide each customer, on no greater than a quarterly basis, a statement of account that, for all OTC non-NASDAQ equity securities in the account for which the firm has been a market maker during the reportable period, contains a value for each security based on the closing market bid on a date certain for any month in which activity has occurred in a customer's account;
 - aa. Failing to comply with any applicable provision of the FINRA Conduct Rules or any applicable fair practice or ethical standard promulgated by the SEC or by a self-regulatory organization approved by the SEC; and
 - bb. Engaging in or aiding in "boiler-room" operations or high-pressure tactics in connection with the promotion of speculative offerings or "hot issues" by means of an intensive telephone campaign or unsolicited calls to persons not known by, nor having an account with, the agent or broker-dealer represented by the agent, where the prospective purchaser is encouraged to make a hasty decision to buy, irrespective of the purchaser's investment needs and objectives.

50.16(2) Dishonest or unethical practices by an agent in the securities business as prohibited pursuant to Iowa Code section 502.412(4) "m" include, but are not limited to, the following:

- a. Lending money or securities to or borrowing money or securities from a customer or acting as a custodian for money, securities, or an executed stock power of a customer unless the customer is a member of the agent's immediate family and the act or practice is approved in advance by the agent's supervisory personnel;
- b. Effecting securities transactions not recorded on the regular books or records of the broker-dealer the agent represents unless the transactions are authorized in writing by the broker-dealer prior to executing the transaction;
- c. Establishing or maintaining an account containing fictitious information for the purpose of executing transactions otherwise prohibited;
- d. Sharing, directly or indirectly, in profits or losses in any customer account without the written authorization of the customer and the broker-dealer the agent represents;
- e. Dividing or otherwise splitting the agent's commissions, profits, or other compensation from the purchase or sale of securities with any person who is not registered as an agent for the same broker-dealer or for a broker-dealer under direct or indirect common control;
- f. Soliciting or accepting a gift, directly or indirectly, from an unrelated customer that in the aggregate exceeds \$250 in a calendar year. A gift accepted by an immediate family member from an unrelated customer shall be included in the aggregate limit. An agent shall not solicit or accept from a customer a gift transferred through a relative or third party to the agent's benefit that would have the effect of evading this paragraph;
- g. Soliciting or accepting being named as a beneficiary, executor, or trustee in a will or trust of an unrelated customer;
- h. Evading or otherwise negating the requirements of paragraph 50.16(2) "a," "f" or "g" by terminating the customer relationship for the purpose of soliciting or accepting a loan or gift or being named as a beneficiary, executor or trustee in a will or trust that the agent is otherwise not permitted to solicit or accept. An agent is not in violation of this paragraph if the agent has made a bona fide termination of the customer relationship and conducted no securities-related business or other business for a period of three years with the customer;
- i. Engaging in conduct specified in subrule 50.16(1), paragraphs "b" to "f," "i," "j," "n" to "q," "u," and "w" to "aa";
- j. Engaging in conduct deemed dishonest or unethical in rule 191—50.55(502); and

k. Employing any method or tactic which uses undue pressure, force, fright, or threat, whether explicit or implied, to solicit the purchase or sale of securities, or committing any act which shows that the agent has exerted undue influence over a person.

This rule is intended to implement Iowa Code section 502.412(4) “*m.*”
[ARC 9169B, IAB 10/20/10, effective 11/24/10; ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.17(502) Rules of conduct.

50.17(1) Each broker-dealer, after executing and before completing each transaction with its customer, shall give or send the customer a written confirmation. A broker-dealer not registered pursuant to the Securities Exchange Act of 1934 shall provide a written confirmation including, at a minimum:

- a.* A description of the security purchased or sold, the date of the transaction, the price at which the security was purchased or sold and any commission charged;
- b.* A statement as to whether the broker-dealer was acting for its own account, as the agent for the customer, as the agent for some other person, or as the agent for both the customer and some other person;
- c.* When the broker-dealer is acting as an agent for the customer, the name of the person from whom the security was purchased or to whom it was sold or the fact that such information will be furnished upon the customer’s request.

50.17(2) A broker-dealer registered pursuant to the Securities Exchange Act of 1934 shall comply with all requirements of the Securities Exchange Act of 1934 and its implementing rules regarding written confirmations.

50.17(3) Each broker-dealer shall establish written supervisory procedures and a system for applying those procedures which may reasonably be expected to prevent and detect any violations of Iowa Code chapter 502, its implementing rules, and any orders issued pursuant to it. Each broker-dealer shall designate and qualify a number of supervisory employees reasonable in relation to the number of its registered agents, offices, and transactions in Iowa.

50.17(4) Each broker-dealer whose principal office is located in Iowa shall have at least one partner, officer or registered agent employed on a full-time basis at its principal office.

This rule is intended to implement Iowa Code sections 502.411(3) and 502.412(4) “*i.*”

191—50.18(502) Limited registration of Canadian broker-dealers and agents.

50.18(1) A Canadian broker-dealer may register under this rule if the broker-dealer:

- a.* Files with the administrator an application in the form required by the jurisdiction in which the broker-dealer has its principal office;
- b.* Files with the administrator a consent to service of process on Form U-2;
- c.* Is registered as a broker-dealer and is in good standing in the jurisdiction from which the broker-dealer is effecting transactions into Iowa and files with the administrator satisfactory evidence thereof;
- d.* Is a member of a self-regulatory organization or stock exchange in Canada; and
- e.* Pays a \$200 filing fee.

50.18(2) An agent representing a Canadian broker-dealer registered under this rule in effecting transactions in securities in Iowa may register under this rule if the agent:

- a.* Files with the administrator an application in the form required by the jurisdiction in which the broker-dealer has its principal office;
- b.* Files with the administrator a consent to service of process;
- c.* Is registered and is in good standing in the jurisdiction from which the agent is effecting transactions into Iowa and files with the administrator satisfactory evidence thereof; and
- d.* Pays a \$40 filing fee.

50.18(3) A Canadian broker-dealer that is resident in Canada and has no office or other physical presence in Iowa may, provided that the broker-dealer is registered under this rule, effect transactions in Iowa:

a. With or for a person from Canada temporarily residing in Iowa with whom the Canadian broker-dealer had a bona fide broker-dealer-client relationship before the person entered the United States;

b. With or for a person from Canada currently residing in Iowa whose transactions are in a self-directed, tax-advantaged retirement plan in Canada of which the person is the holder or contributor; or

c. With or through:

- (1) The issuers of the securities involved in the transactions;
- (2) Other registered broker-dealers;
- (3) Banks, savings institutions, trust companies, insurance companies, or investment companies as the term is defined in the Investment Company Act of 1940;
- (4) Pension or profit-sharing trusts; or
- (5) Other financial institutions or institutional investors, whether acting on their own behalf or as trustees.

50.18(4) An agent registered pursuant to subrule 50.18(2) representing a Canadian broker-dealer registered pursuant to subrule 50.18(1) may effect all securities transactions that the broker-dealer is authorized by subrule 50.18(3) to effect.

50.18(5) If no denial order is in effect and no proceeding is pending pursuant to Iowa Code section 502.304, a registration filed pursuant to this rule becomes effective on the forty-fifth day after an application is filed, unless otherwise provided by order of the administrator.

50.18(6) A Canadian broker-dealer registered under this rule shall:

a. Maintain provincial or territorial registration and membership in a self-regulatory organization or stock exchange and remain in good standing in each;

b. Provide, upon the administrator's request, all books and records relating to its business in Iowa as a broker-dealer;

c. Promptly inform the administrator of any criminal action taken against the broker-dealer or of any finding or sanction imposed on the broker-dealer as a result of a self-regulatory or other regulatory action involving fraud, theft, deceit, misrepresentation, or like conduct; and

d. Disclose in writing to each of the broker-dealer's clients in Iowa that the broker-dealer and its agents are not subject to the full regulatory requirements of the Act.

50.18(7) An agent of a Canadian broker-dealer registered under this rule shall:

a. Maintain the agent's provincial or territorial registration and remain in good standing; and

b. Promptly inform the administrator of any criminal action taken against the agent or of any finding or sanction imposed on the agent as a result of a self-regulatory or other regulatory action involving fraud, theft, deceit, misrepresentation, or like conduct.

50.18(8) Renewal applications for Canadian broker-dealers and agents under this rule must be filed before December 1 each year and may be made by filing with the administrator the most recent renewal application, if any, filed in the jurisdiction in which the broker-dealer has its principal office or, if no such renewal application is required, the most recent application filed pursuant to paragraph 50.18(1) "a" or 50.18(2) "a."

50.18(9) Every applicant for registration or renewal registration pursuant to this rule shall pay the applicable fee for broker-dealers and agents as set forth in Iowa Code section 502.410.

50.18(10) A Canadian broker-dealer or agent registered under this rule and in compliance with paragraph 50.18(3) "c" is exempt from all the requirements of the Act, except for the antifraud sections and the requirements set out in this rule.

50.18(11) All transactions in securities effected between Canadian broker-dealers or agents registered under this rule and Canadian persons meeting the requirements of paragraph 50.18(3) "a" or "b" are exempt from Iowa Code sections 502.301 and 502.504.

This rule is intended to implement Iowa Code section 502.401(4).

[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.19(502) Brokerage services by national and state banks.

50.19(1) A bank may, without registering as a broker-dealer, effect:

- a. Transactions pursuant to Iowa Code section 502.102(4) “c”; or
- b. Transactions permitted by order of the administrator.

50.19(2) A bank that has entered into a contract with an Iowa-registered broker-dealer may provide the following ministerial securities services without registering as a broker-dealer:

a. Provide bank customers and the public with a telephone number of the broker-dealer and provide telephone facilities on bank premises for customers and members of the public to use in contacting the broker-dealer;

b. Distribute literature to bank customers and members of the public about particular services provided by the broker-dealer, subject to the requirements of subrule 50.19(4);

c. Provide broker-dealer account applications to bank customers and members of the public and provide assistance in completing the forms. The disclosures required pursuant to subrule 50.19(4), in the form prescribed by subrule 50.19(5), shall be included on either the account application or an attachment to the application. If the disclosures are provided on an attachment to the application, both the application and attachment must be signed by the applicant. The bank may mail the completed account applications to a broker-dealer;

d. Assist bank customers wishing to transfer funds into and out of their bank accounts for securities transactions; and

e. Provide mailers to bank customers and members of the public and assist them in transmitting securities and securities documents to the broker-dealer.

50.19(3) A bank that has entered into a contract with an Iowa-registered broker-dealer may attempt to effect and effect securities transactions without registering as a broker-dealer if all of the following requirements are met:

a. Any bank employee who attempts to effect and effects securities transactions is a registered agent of the broker-dealer and:

- (1) Has passed an acceptable subject matter examination pursuant to paragraph 50.12(1) “a”;
- (2) Has passed the FINRA Series 63 or Series 66 examination;
- (3) Is registered with FINRA; and
- (4) Is registered as an agent of the broker-dealer pursuant to rule 191—50.12(502).

b. If the broker-dealer provides securities services in an area of public access on the bank premises in which banking services are not provided, the bank requires that the broker-dealer clearly distinguish the area in which securities services are provided. If securities services and banking services are provided in the same public area on the bank premises, there shall be a sign clearly identifying the broker-dealer providing the securities services.

c. The bank receives only the following types of compensation from the broker-dealer:

(1) Transaction-related compensation, subject to the restrictions provided by paragraph 50.19(7) “b”;

(2) An administrative fee;

(3) Payments for compensation of employees jointly employed by the bank and the broker-dealer; and

(4) Lease payments.

50.19(4) A bank attempting to effect and effecting securities transactions pursuant to a contract with an Iowa-registered broker-dealer may distribute advertisements or promotional materials without registering as a broker-dealer if the advertisements or promotional materials clearly and prominently:

a. Identify the broker-dealer;

b. State in bold typeface that securities transactions and related earnings or profits are not insured by the FDIC;

c. State that the securities offered by the broker-dealer are not guaranteed by, nor are they obligations of, the bank; and

d. State that the bank and the broker-dealer are separate organizations.

50.19(5) The following or a similar statement printed in bold typeface and capital letters shall satisfy the disclosure requirements of subrule 50.19(4): [NAME OF BROKER-DEALER] IS NOT A BANK, AND SECURITIES OFFERED BY [NAME OF BROKER-DEALER] ARE NOT BACKED OR GUARANTEED BY ANY BANK NOR ARE THEY INSURED BY THE FDIC.

50.19(6) The disclosure requirements of subrule 50.19(4) shall not apply to radio or television advertisements not exceeding 30 seconds in length.

50.19(7) A bank shall not engage in the following securities activities:

a. Distribute prospectuses to bank customers or to members of the public regarding securities unless done so:

- (1) In the exercise of trust functions permitted to banks;
- (2) Pursuant to registration as a broker-dealer; or
- (3) In the performance of securities activities as permitted by subrule 50.19(1), 50.19(2), or 50.19(3);

b. Allow registered joint bank and broker-dealer employees to split commissions or other transaction-related remuneration received from customers with unregistered bank employees;

c. Transmit account statements, confirmations, or other broker-dealer communications to bank customers or members of the public unless the communications contain a disclosure statement as required by subrule 50.19(4);

d. Permit bank employees who are not registered securities agents of the broker-dealer to receive or transmit orders to the broker-dealer from customers or the public, except as permitted by subrule 50.19(1); and

e. Permit bank employees who are not registered agents of the broker-dealer to perform securities functions directly involving customer contact, except as provided in subrules 50.19(1) and 50.19(2).

This rule is intended to implement Iowa Code sections 502.102(4) “c” and 502.401.
[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.20(502) Broker-dealers having contracts with national and state banks.

50.20(1) A broker-dealer engaging in securities activities with banks as permitted by subrules 50.19(2) and 50.19(3) shall maintain for three years and make available to the administrator upon request the following records:

a. Copies of all advertisements and promotional literature disseminated by the bank and broker-dealer regarding securities services and products offered by the broker-dealer to bank customers and the public;

b. Copies of each contract executed between the bank and the broker-dealer which propose to sell securities to bank customers or the public;

c. Copies of new account forms to be completed by bank customers or members of the public who open an account with the broker-dealer;

d. A list of every bank employee who is a registered securities agent of the broker-dealer and the employee’s social security number and CRD number; and

e. Copies of compliance and procedures manuals regarding the securities activities of the bank.

50.20(2) In addition to any responsibilities assumed pursuant to subrule 50.69(5), a broker-dealer engaging in securities transactions pursuant to a contract with a bank as permitted by subrules 50.19(2) and 50.19(3) shall not allow a person who is not an Iowa-registered securities agent of the broker-dealer to use the broker-dealer name, logo, or trademark on business cards or letterheads.

This rule is intended to implement Iowa Code sections 502.102(4) “c” and 502.401.

191—50.21(502) Brokerage services by credit unions, savings banks, and savings and loan institutions.

50.21(1) A credit union, savings bank, or savings and loan institution may, without registering as a broker-dealer, effect:

a. Transactions pursuant to Iowa Code section 502.102(4) “c”; and

b. Transactions permitted by order of the administrator.

50.21(2) A credit union, savings bank, or savings and loan institution that has entered into a contract with an Iowa-registered broker-dealer may provide the following ministerial securities services without registering as a broker-dealer:

a. Provide customers and the public with a telephone number of the broker-dealer and provide telephone facilities on its premises for customers and members of the public to use in contacting the broker-dealer;

b. Distribute literature to its customers and members of the public about particular services provided by the broker-dealer, subject to the requirements of subrule 50.21(4);

c. Provide broker-dealer account applications to its customers and members of the public and provide assistance in completing the forms. The disclosures required pursuant to subrule 50.21(4) shall be included on either the account application or an attachment to the application. If the disclosures are provided on an attachment to the application, both the application and attachment must be signed by the applicant. The credit union, savings bank, or savings and loan institution may mail the completed account applications to a broker-dealer;

d. Assist its customers wishing to transfer funds into and out of their accounts for securities transactions; and

e. Provide mailers to its customers and members of the public and assist them in transmitting securities and securities documents to the broker-dealer.

50.21(3) A credit union, savings bank, or savings and loan institution that has entered into a contract with an Iowa-registered broker-dealer may attempt to effect and effect securities transactions without registering as a broker-dealer if all of the following requirements are met:

a. Any credit union, savings bank, or savings and loan institution employee who attempts to effect and effects securities transactions is a registered agent of the broker-dealer and:

- (1) Has passed an acceptable subject matter examination pursuant to paragraph 50.12(1)“*a*”;
- (2) Has passed the FINRA Series 63 or Series 66 examination;
- (3) Is registered with FINRA; and
- (4) Is registered as an agent of the broker-dealer pursuant to rule 191—50.12(502).

b. If the broker-dealer provides securities services in an area of public access on the credit union, savings bank, or savings and loan institution premises in which credit union, savings bank, or savings and loan institution services are not provided, the credit union, savings bank, or savings and loan institution requires that the broker-dealer clearly distinguish the area in which securities services are provided. If securities services and credit union, savings bank, or savings and loan institution services are provided in the same public area on the bank premises, there shall be a sign clearly identifying the broker-dealer providing the securities services.

c. The credit union, savings bank, or savings and loan institution receives only the following types of compensation from the broker-dealer:

- (1) Transaction-related compensation, subject to the restrictions provided by paragraph 50.19(7)“*b*”;
- (2) An administrative fee;
- (3) Payments for compensation of employees jointly employed by the credit union, savings bank, or savings and loan institution and the broker-dealer; and
- (4) Lease payments.

50.21(4) Credit unions, savings banks, and savings and loan institutions attempting to effect and effecting securities transactions under contracts with Iowa-registered broker-dealers may distribute advertisements or promotional materials without registering as broker-dealers if the advertisements or promotional materials clearly and prominently:

a. Identify the broker-dealer.

b. Disclose in bold print that securities transactions and related earnings or profits are not insured by:

- (1) The FDIC, in the case of savings banks and savings and loan institutions, or
- (2) The NCUA, in the case of credit unions.

c. Disclose that securities offered by the broker-dealer are not guaranteed by, nor are they obligations of, the credit union, savings bank, or savings and loan institution.

d. Disclose that the credit union, savings bank, or savings and loan institution and the broker-dealer are separate organizations.

50.21(5) The following or a similar statement in bold print and capital letters will satisfy the disclosure requirements of subrule 50.21(4): [NAME OF BROKER-DEALER] IS NOT A [SAVINGS BANK, SAVINGS AND LOAN INSTITUTION, OR CREDIT UNION], AND SECURITIES OFFERED BY [NAME OF BROKER-DEALER] ARE NOT BACKED OR GUARANTEED BY ANY [SAVINGS BANK, SAVINGS AND LOAN INSTITUTION, OR CREDIT UNION] NOR ARE THEY INSURED BY THE [FDIC OR NCUA].

50.21(6) The disclosure requirements of subrule 50.21(4) shall not apply to radio or television advertisements not exceeding 30 seconds in length.

50.21(7) Credit unions, savings banks, and savings and loan institutions shall not:

a. Distribute prospectuses for securities to customers or to members of the public except:

- (1) In the exercise of trust functions permitted to them;
- (2) Pursuant to registration as a broker-dealer; or
- (3) In the performance of securities activities as permitted by subrules 50.21(1) to 50.21(3); or

b. Engage in any of the activities proscribed if performed by an unregistered bank by paragraphs 50.19(7) “*b*” to “*e*.”

This rule is intended to implement Iowa Code sections 502.102(4) “*c*” and 502.401. [ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.22(502) Broker-dealers having contracts with credit unions, savings banks, and savings and loan institutions.

50.22(1) A broker-dealer engaging in securities activities with credit unions, savings banks, or savings and loan institutions as permitted by subrules 50.21(2) and 50.21(3) shall maintain for three years and make available to the administrator upon request the following records:

a. Copies of all advertisements and promotional literature disseminated by the credit union, savings bank, or savings and loan institution and the broker-dealer regarding securities services and products offered by the broker-dealer to credit union, savings bank, or savings and loan institution customers and the public;

b. Copies of each contract executed between the credit union, savings bank, or savings and loan institution and the broker-dealer which proposes to sell securities to credit union, savings bank, or savings and loan institution customers or the public;

c. Copies of new account forms to be completed by credit union, savings bank, or savings and loan institution customers or members of the public who open an account with the broker-dealer;

d. A list of every credit union, savings bank, or savings and loan institution employee who is a registered securities agent of the broker-dealer and the employee’s social security number and CRD number; and

e. Copies of compliance and procedures manuals regarding the securities activities of the credit union, savings bank, or savings and loan institution.

50.22(2) In addition to any responsibilities assumed pursuant to subrule 50.69(5), a broker-dealer engaging in securities transactions pursuant to a contract with a credit union, savings bank, or savings and loan institution as permitted by subrules 50.21(2) and 50.21(3) shall not allow a person who is not an Iowa-registered securities agent of the broker-dealer to use the broker-dealer name, logo, or trademark on business cards or letterheads.

This rule is intended to implement Iowa Code sections 502.102(4) “*c*” and 502.401.

191—50.23 to 50.29 Reserved.

AND FEDERAL COVERED INVESTMENT ADVISERS

191—50.30(502) Electronic filing with designated entity.

50.30(1) Designation. Pursuant to Iowa Code sections 502.406 and 502.608(3)“a,” the administrator designates the IARD operated by FINRA to receive and store filings and collect related fees from investment advisers on behalf of the administrator.

50.30(2) Use of IARD. Unless otherwise provided, all investment adviser applications, amendments, reports, notices, related filings and fees required to be filed with the administrator pursuant to the rules promulgated under the Act shall be filed electronically with and transmitted to IARD. The following additional conditions relate to such electronic filings:

a. Electronic signature. When a signature or signatures are required by the particular instructions of any filing to be made through IARD, a duly authorized signatory of the applicant, as required, shall affix the duly authorized signatory’s electronic signature to the filing by typing the duly authorized signatory’s name in the appropriate fields and submitting the filing to IARD. Submission of a filing in this manner shall constitute irrefutable evidence of legal signature by any individuals whose names are typed on the filing.

b. When filed. Solely for purposes of a filing made through IARD, a document is considered filed with the administrator when all fees are received and the filing is accepted by IARD on behalf of the state.

This rule is intended to implement Iowa Code sections 502.102(8), 502.406 and 502.608(3)“a.”
[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.31(502) Investment adviser applications and renewals.

50.31(1) Investment adviser applications—required filings. The application for initial registration as an investment adviser shall be made by:

- a.* Filing Form ADV Parts 1 and 2 with IARD; and
- b.* Remitting the \$100 filing fee to IARD pursuant to Iowa Code section 502.410(3).

50.31(2) Investment adviser applications—discretionary filings. The administrator may require that an application for initial registration also include the following:

- a.* Financial statements as set forth in paragraph 50.42(1)“f” including, but not limited to, a copy of the balance sheet for the last fiscal year and, if the balance sheet is prepared as of a date more than 45 days from the date of the filing of the application, an unaudited balance sheet prepared in accordance with subrule 50.40(7);
- b.* A copy of the surety bond required pursuant to rule 191—50.41(502), if any; and
- c.* Any other information necessary for determining whether registration is appropriate.

50.31(3) Investment adviser renewals—required filings. Annual renewals by investment advisers shall be made by:

- a.* Filing an annual renewal registration with IARD; and
- b.* Remitting the \$100 filing fee to IARD as required pursuant to Iowa Code section 502.410(3).

50.31(4) Investment adviser renewals—discretionary filings. The administrator may require the filing of a copy of the surety bond, if any, required pursuant to rule 191—50.41(502).

50.31(5) Completion of filing. An application for initial or renewal registration is considered filed for the purposes of Iowa Code section 502.406 when the required fee and all required submissions have been received by IARD and the administrator.

50.31(6) Updates and amendments. The investment adviser is under a continuing obligation to update information provided on Form ADV as follows:

- a.* An updated Form ADV must be filed with IARD within 90 days of the end of the investment adviser’s fiscal year; and
- b.* Any amendment to Form ADV must be filed with IARD within 30 days of the event causing the required amendment.

50.31(7) Succession and change in registration.

a. In the case of an organizational change, including a change in the state of incorporation or form of organization, not involving a material change in financial condition or management, an investment adviser shall file all applicable amendments to Form ADV.

b. In the case of an organizational change, including a change in the state of incorporation or form of organization, involving a material change in financial condition or management, an investment adviser must file a new application for registration pursuant to subrule 50.31(1). The filing must include the fee pursuant to paragraph 50.31(1) “*b*” and registration fees for all Iowa-registered investment adviser representatives.

c. In the case of a change in name, an investment adviser shall file all applicable amendments to Form ADV.

This rule is intended to implement Iowa Code sections 502.102(8) and 502.406.
[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.32(502) Application for investment adviser representative registration.

50.32(1) Designation. Pursuant to Iowa Code sections 502.406 and 502.608(3) “*a*,” the administrator designates the CRD operated by FINRA to receive and store filings and collect related fees from investment adviser representatives on behalf of the administrator.

50.32(2) Initial application. The application for initial registration as an investment adviser representative made pursuant to Iowa Code section 502.406(1) shall be made by filing Form U-4 with the CRD. The following shall be submitted to the CRD with the application:

a. Proof of compliance by the investment adviser representative with the examination requirements of rule 191—50.33(502); and

b. If applicable, the \$30 fee required pursuant to Iowa Code section 502.410(4).

50.32(3) Annual renewal. Annual renewals by investment adviser representatives shall be made by:

a. Filing an annual renewal registration with CRD; and

b. If applicable, remitting the \$30 filing fee to CRD as required pursuant to Iowa Code section 502.410(4).

50.32(4) Completion of filing. An application for initial or renewal registration is considered filed for the purposes of Iowa Code section 502.406 when the required fee and all required submissions have been received by the CRD.

50.32(5) Updates, amendments, withdrawals and terminations. The investment adviser representative is under a continuing obligation to update information provided on Form U-4 as follows:

a. Any amendment to information provided on Form U-4 must be filed with CRD within 30 days of the event causing the required amendment; and

b. A withdrawal request or termination must be filed with CRD within 30 days of the event causing the necessity of a withdrawal request or termination. A withdrawal request shall be made by filing an accurate and complete Form U-5 with CRD.

This rule is intended to implement Iowa Code sections 502.102(8) and 502.406.
[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.33(502) Examination requirements.

50.33(1) Except as exempted by subrule 50.33(2), a person applying to be registered as an investment adviser representative shall provide the administrator with proof that the person has obtained either:

a. A passing score on the Series 65 examination.

b. Passing scores on both the Series 7 examination and the Series 66 examination and, if the application is received by the administrator on or after October 1, 2018, FINRA’s Securities Industry Essentials Exam. In the event that an applicant for registration as an investment adviser representative has received a waiver by FINRA of the Series 7 examination otherwise required by this paragraph, the FINRA waiver will be accepted in lieu of the examination requirement.

50.33(2) Unless otherwise ordered by the administrator in connection with a violation of the Act, the following individuals shall be exempt from the examination requirements of subrule 50.33(1):

a. Any individual who is registered as an investment adviser or investment adviser representative in any jurisdiction in the United States on or before January 19, 2000.

b. Any individual who is registered as an investment adviser or investment adviser representative in any jurisdiction in the United States after November 1, 2001, provided that the jurisdiction in which the investment adviser or investment adviser representative is registered requires the passage of the examinations in subrule 50.33(1).

c. Any individual who has not been registered as an investment adviser or investment adviser representative in any jurisdiction for a period of two years shall be required to comply with the examination requirements of this rule.

d. Any individual who currently holds one of the following professional designations:

(1) Certified Financial Planner or CFP designation awarded by the Certified Financial Planner Board of Standards, Inc.;

(2) Chartered Financial Consultant (ChFC) designation awarded by The American College, Bryn Mawr, Pennsylvania;

(3) Personal Financial Specialist (PFS) designation administered by the American Institute of Certified Public Accountants;

(4) Chartered Financial Analyst (CFA) designation granted by the Association for Investment Management and Research;

(5) Chartered Investment Counselor (CIC) designation granted by the Investment Counsel Association of America; or

(6) Any other professional designation recognized by order of the administrator.

This rule is intended to implement Iowa Code section 502.412(5).

[ARC 9169B, IAB 10/20/10, effective 11/24/10; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.34(502) Notice filing requirements for federal covered investment advisers.

50.34(1) Notice filing. The notice filing for a federal covered investment adviser pursuant to Iowa Code section 502.405 shall be filed with IARD on an executed Form ADV. A notice filing of a federal covered investment adviser shall be deemed filed for purposes of this subrule when Form ADV and the fee of \$100 required pursuant to Iowa Code section 502.410(5) are received by IARD.

50.34(2) Form ADV Part 2. The administrator may:

a. Accept a copy of Part 2 of Form ADV as filed electronically with IARD; or

b. Deem Part 2 of Form ADV filed if a federal covered investment adviser provides, within five days of a request, Part 2 of Form ADV to the administrator. Because the administrator deems Part 2 of Form ADV to be filed, a federal covered investment adviser is not required to submit Part 2 of Form ADV to the administrator unless specifically requested to do so.

50.34(3) Renewal. The annual renewal of the notice filing for a federal covered investment adviser pursuant to Iowa Code section 502.405 shall be filed with IARD. The renewal of the notice filing shall be deemed filed for purposes of this subrule when the \$100 fee required pursuant to Iowa Code section 502.410(5) is accepted by IARD.

50.34(4) Updates and amendments. A federal covered investment adviser must file with IARD any amendments to the federal covered investment adviser's Form ADV.

This rule is intended to implement Iowa Code section 502.405.

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.35(502) Withdrawal of investment adviser registration. The application for withdrawal of registration as an investment adviser pursuant to Iowa Code section 502.409 shall be completed on Form ADV-W and filed with IARD.

This rule is intended to implement Iowa Code section 502.409.

191—50.36(502) Investment adviser brochure.

50.36(1) General requirements.

a. Unless otherwise provided in this rule, an investment adviser registered or required to be registered pursuant to Section 403 of the Act shall furnish each advisory client and prospective advisory client with:

- (1) A brochure which may be a copy of Part 2A of its Form ADV or written documents containing the information required by Part 2A of Form ADV;
 - (2) A copy of its Part 2B brochure supplement for each individual:
 1. Providing investment advice and having direct contact with clients in this state; or
 2. Exercising discretion over assets of clients in this state, even if no direct contact is involved;
 - (3) A copy of its Part 2A Appendix 1 wrap fee brochure if the investment adviser sponsors or participates in a wrap fee account;
 - (4) A summary of material changes, which may be included in Form ADV Part 2 or given as a separate document; and
 - (5) Such other information as the administrator may require.
- b.* The brochure must comply with the language, organizational format and filing requirements specified in the Instructions to Form ADV Part 2.
- c.* Notwithstanding the SEC's Instructions for Part 2A of Form ADV, fee changes constitute material changes requiring an update to all parts of Form ADV.

50.36(2) Delivery.

a. Initial delivery. An investment adviser, except as provided in paragraph 50.36(2)“c,” shall deliver the Part 2A brochure and any brochure supplements required by rule 191—50.36(502) to a prospective advisory client:

- (1) Not less than 48 hours before an investment adviser enters into any advisory contract with such client or prospective client; or
- (2) At the time an advisory client enters into any such contract, if the advisory client has a right to terminate the contract without penalty within five business days after entering into the contract.

b. Annual delivery. An investment adviser, except as provided in paragraph 50.36(2)“c,” must:

- (1) Deliver within 120 days of the end of its fiscal year a free, updated brochure and related brochure supplements which include or are accompanied by a summary of material changes; or
- (2) Deliver a summary of material changes that includes an offer to provide a copy of the updated brochures and supplements and information on how the client may obtain a copy of the brochures and supplements, provided that advisers are not required to deliver a summary of material changes if no material changes have taken place since the last summary and brochure delivery.

c. Exceptions to delivery. Delivery of the brochure and related brochure supplements required by paragraphs 50.36(2)“a” and “b” need not be made to:

- (1) Clients who receive only impersonal advice and who pay less than \$500 in fees per year; or
- (2) An investment company registered under the Investment Company Act of 1940; or
- (3) A business development company as defined in the Investment Company Act of 1940 and whose advisory contract meets the requirements of Section 15c of that Act.

d. Electronic delivery. Delivery of the brochure and related supplements may be made electronically if the investment adviser:

- (1) In the case of an initial delivery to a potential client, obtains verification that readable copies of the brochure and supplements were received by the client;
- (2) In the case of other than initial deliveries, obtains each client's prior consent to provide the brochure and supplements electronically;
- (3) Prepares the electronically delivered brochure and supplements in the format prescribed in subrule 50.36(1) and Instructions to Form ADV Part 2;
- (4) Delivers the brochure and supplements in a format that can be retained by the client in either electronic or paper form; or
- (5) Establishes procedures to supervise personnel transmitting the brochure and supplements and to prevent violations of this rule.

50.36(3) Other disclosures. Nothing in this rule shall relieve any investment adviser from any obligation pursuant to any provision of the Act or the rules thereunder or other federal or state law to disclose any information to its advisory clients or prospective advisory clients not specifically required by this rule.

50.36(4) Definitions. For the purpose of this rule:

a. "Contract for impersonal advisory services" means any contract relating solely to the provision of investment advisory services:

- (1) By means of written material or oral statements which do not purport to meet the objectives or needs of specific individuals or accounts;
- (2) Through the issuance of statistical information containing no expression of opinion as to the investment merits of a particular security; or
- (3) Any combination of the foregoing services.

b. "Entering into," in reference to an advisory contract, does not include an extension or renewal without material change of any such contract which is in effect immediately prior to such extension or renewal.

This rule is intended to implement Iowa Code section 502.411(7).
[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.37(502) Cash solicitation.

50.37(1) Payment of a cash fee, directly or indirectly, by an investment adviser to a solicitor for solicitation activities shall constitute an act, practice, or course of conduct operating as a fraud or deceit upon a person, pursuant to Iowa Code section 502.502(2), if:

- a. The solicitor:*
- (1) Is subject to an order issued by the administrator pursuant to Iowa Code section 502.412(4);
 - (2) Has been convicted of a felony or within the previous ten years has been convicted of a misdemeanor involving conduct described in Iowa Code section 502.412(4) "*c*"; or
 - (3) Is found by the administrator to have engaged or has been convicted of engaging in any of the conduct specified in Iowa Code section 502.505, 502.412(4) "*b*" or 502.412(4) "*i*"; has materially aided in violating Iowa Code section 502.412(4) "*d*"; or is subject to an order, judgment, or decree pursuant to Iowa Code section 502.412(4) "*d*" to "*f*."

b. The cash fee is not paid pursuant to a written agreement to which the investment adviser is a party. If the cash fee is paid pursuant to a written agreement, the written agreement must:

- (1) Describe the solicitation activities to be engaged in by the solicitor on behalf of the investment adviser and the compensation to be received for the solicitation activities;
- (2) Contain an undertaking by the solicitor to perform the solicitor's duties under the agreement in a manner consistent with the instructions of the investment adviser and the provisions of the Act and its implementing rules, as applicable; and
- (3) Require that the solicitor, at the time of any solicitation activities for which compensation is paid or is to be paid by the investment adviser, provide the client with a current copy of the investment adviser's written disclosure statement required by subparagraph 50.36(2) "*a*"(2) or SEC Rule 204-3, if applicable, and a separate written disclosure statement as described in subrule 50.37(2). Prior to or upon entering into a written or oral investment advisory contract with a client, the investment adviser shall obtain a signed and dated acknowledgment of receipt by the client of the investment adviser's and solicitor's written disclosure statements. Additionally, the investment adviser shall make a bona fide effort to ascertain whether the solicitor has complied in all aspects with the written agreement, and shall have a reasonable basis for believing that the solicitor has complied.

c. The cash fee is paid to a solicitor:

- (1) For solicitation activities regarding anything other than impersonal advisory services; or
- (2) Who is a partner, officer, director, or employee of the investment adviser or is a partner, officer, director, or employee of a person who controls, is controlled by, or is under common control with the investment adviser without disclosure of the status of the solicitor as a partner, officer, director, or employee of the investment adviser or other person and of any affiliation between the investment adviser and the solicitor to the client at the time of solicitation or referral.

50.37(2) The separate written disclosure statement required to be furnished pursuant to subparagraph 50.37(1) "*b*"(3) shall contain the following information:

- a. The name of the solicitor;*
- b. The name of the investment adviser;*

- c. The nature of the relationship, including any affiliation, between the solicitor and the investment adviser;
- d. A statement that the solicitor will be compensated for the solicitor's solicitation services by the investment adviser;
- e. The terms of such compensation arrangement, including a description of the compensation paid or to be paid to the solicitor; and
- f. The amount, if any, the client will be charged for the cost of obtaining the client's account in addition to the advisory fee, and the differential, if any, in advisory fees charged by the investment adviser if the differential is the result of the investment adviser's agreement to compensate the solicitor for soliciting or referring clients.

50.37(3) Nothing in this rule relieves any person of any fiduciary duty or other obligation to which the person may be subject pursuant to contract or law.

50.37(4) For the purpose of this rule:

"*Client*" includes any prospective client.

"*Impersonal advisory services*" means investment advisory services provided solely through written materials or oral statements not purporting to meet the objectives or needs of the specific client, statistical information containing no expressions of opinion as to the investment merits of particular securities, or any combination of the foregoing.

"*Principal place of business*" of an investment adviser means the executive office of the investment adviser from which the officers, partners, or managers of the investment adviser direct, control, and coordinate the activities of the investment adviser.

"*Solicitor*" means any person who, directly or indirectly, solicits any client for or refers any client to an investment adviser.

50.37(5) An investment adviser shall retain a copy of each written agreement, acknowledgment and solicitor disclosure statement required by this rule in accordance with Iowa Code section 502.411(3) and paragraph 50.42(1)"o." However, an investment adviser registered in Iowa whose principal place of business is located outside Iowa shall not be subject to the record maintenance requirements of this subrule and the applicable provisions of paragraph 50.42(1)"o" if:

- a. The investment adviser is registered or licensed as an investment adviser in the state in which the investment adviser maintains the investment adviser's principal place of business;
- b. The investment adviser complies with the applicable books and records requirements of the state in which the investment adviser maintains the investment adviser's principal place of business; and
- c. The provisions of this rule would require the investment adviser to maintain books or records in addition to those required by the laws of the state in which the investment adviser maintains the investment adviser's principal place of business.

This rule is intended to implement Iowa Code section 502.502(2).

191—50.38(502) Prohibited conduct in providing investment advice.

50.38(1) An investment adviser, an investment adviser representative, or a federal covered investment adviser is a fiduciary and has a duty to act primarily for the benefit of its clients. Rule 191—50.38(502) applies to federal covered investment advisers to the extent that the alleged conduct is fraudulent, deceptive, or as otherwise permitted by the NSMIA. While the extent and nature of this duty varies according to the nature of the relationship between an investment adviser, an investment adviser representative, or a federal covered investment adviser and its clients and the circumstances of each case, an investment adviser, an investment adviser representative, or a federal covered investment adviser shall not engage in prohibited fraudulent, deceptive, or manipulative conduct including, but not limited to:

- a. Recommending to a client to whom investment advisory services are provided the purchase, sale, or exchange of any security without reasonable grounds to believe that the recommendation is suitable for the client on the basis of information furnished by the client after reasonable inquiry concerning the client's investment objectives, financial situation and needs, and any other information

known by the investment adviser, investment adviser representative, or federal covered investment adviser;

b. Exercising any discretionary authority in placing an order for the purchase or sale of securities for a client without obtaining written discretionary authority from the client within ten business days after the date of the first transaction placed pursuant to discretionary authority, unless the discretionary authority relates solely to the price at which, or the time when, an order for a definite amount of a specified security shall be executed, or both;

c. Inducing trading in a client's account that is excessive in size or frequency compared to the financial resources, investment objectives, and character of the account;

d. Placing an order to purchase or sell a security for a client account without authority to do so;

e. Placing an order to purchase or sell a security for a client account upon instruction of a third party without first obtaining a written third-party trading authorization from the client;

f. Borrowing money or securities from a client unless the client is a broker-dealer, an affiliate of the investment adviser, or a financial institution engaged in the business of loaning funds;

g. Loaning money or securities to a client unless the investment adviser is a financial institution engaged in the business of loaning funds or the client is an affiliate of the investment adviser;

h. Misrepresenting to any client, or prospective client, the qualifications of the investment adviser, investment adviser representative, or federal covered investment adviser or any employee, or affiliated persons, or misrepresenting the nature of the advisory services being offered or fees to be charged for such service, or omitting to state a material fact necessary to make the statements made regarding qualifications, services or fees, in light of the circumstances under which they are made, not misleading;

i. Providing a report or recommendation to any advisory client prepared by someone other than the investment adviser, investment adviser representative, or federal covered investment adviser without disclosing that fact. This prohibition does not apply when the investment adviser, investment adviser representative, or federal covered investment adviser uses published research reports or statistical analyses to render advice or when an investment adviser, investment adviser representative, or federal covered investment adviser orders such a report in the normal course of providing service;

j. Charging a client an unreasonable fee;

k. Failing to disclose to clients in writing before any advice is rendered any material conflict of interest regarding the investment adviser, investment adviser representative, or federal covered investment adviser or any of its employees, or affiliated persons which could reasonably be expected to impair the rendering of unbiased and objective advice including, but not limited to:

(1) Compensation arrangements connected with investment advisory services to clients which are in addition to compensation from such clients for such services; and

(2) Charging a client an investment advisory fee for rendering advice when compensation for effecting securities transactions pursuant to such advice will be received by the investment adviser, investment adviser representative, or federal covered investment adviser or its employees or affiliated persons;

l. Knowingly selling any security to or purchasing any security from a client while acting as principal for an advisory account of the investment adviser, investment adviser representative, or federal covered investment adviser, or knowingly effecting any sale or purchase of any security for the account of the client while acting as broker-dealer for a person other than the client, without disclosing to the client in writing before the completion of the transaction the capacity in which the investment adviser, investment adviser representative, or federal covered investment adviser is acting and without obtaining the written consent of the client to the transaction.

(1) The prohibitions of paragraph 50.38(1) "l" shall not apply to any transaction with a customer of a broker-dealer if the broker-dealer is not acting as an investment adviser in relation to the transaction.

(2) The prohibitions of paragraph 50.38(1) "l" shall not apply to any transaction with a customer of a broker-dealer if the broker-dealer acts solely as an investment adviser:

1. By means of publicly distributed written materials or publicly made oral statements;

2. By means of written materials or oral statements not purporting to meet the objectives or needs of specific individuals or accounts;

3. Through the issuance of statistical information containing no expressions of opinion as to the investment merits of a particular security; or

4. Any combination of the foregoing services.

(3) Publicly distributed written materials or publicly made oral statements shall disclose that, if the purchaser of the advisory communication uses the investment adviser's services in connection with the sale or purchase of a security which is a subject of the communication, the investment adviser may act as principal for its own account or as agent for another person. Compliance by the investment adviser with the foregoing disclosure requirement shall not relieve the investment adviser of any other disclosure obligations under the Act.

(4) Definitions for purposes of rule 191—50.38(502):

1. "*Publicly distributed written materials*" means written materials which are distributed to 35 or more persons who pay for those materials.

2. "*Publicly made oral statements*" means oral statements made simultaneously to 35 or more persons who pay for access to those statements.

m. Guaranteeing a client that a specific result will be achieved with advice rendered;

n. Making, in the solicitation of clients, any untrue statement of a material fact, or omitting to state a material fact necessary in order to make the statement made, in light of the circumstances under which they are made, not misleading;

o. Disclosing the identity, affairs, or investments of any client unless required by law to do so, or unless disclosed with the client's consent;

p. Taking any action, directly or indirectly, regarding securities or funds in which any client has any beneficial interest when the investment adviser has custody or possession of such securities or funds and when the action of the investment adviser or investment adviser representative is subject to and in violation of the custody requirements provided by rule 191—50.39(502);

q. Failing to establish, maintain, and enforce written policies and procedures reasonably designed to prevent the misuse of material nonpublic information in violation of Section 204A of the Investment Advisers Act of 1940;

r. Engaging in any act, practice, or course of business which is fraudulent, deceptive, manipulative, or unethical;

s. Engaging in conduct or any act, indirectly or through or by any other person, which is unlawful for such person to do directly under the provisions of this Act, its implementing rules, or order of the administrator;

t. Failing to disclose or providing incomplete disclosure to a client regarding any securities-related activities, or engaging in deceptive practices;

u. Soliciting or accepting a gift, directly or indirectly, from an unrelated customer that in the aggregate exceeds \$250 in a calendar year. A gift accepted by an immediate family member from an unrelated client shall be included in the aggregate limit. An investment adviser shall not solicit or accept from a client a gift transferred through a relative or third party to the investment adviser's benefit that would have the effect of evading this paragraph;

v. Soliciting or accepting being named as a beneficiary, executor, or trustee in a will or trust of an unrelated customer;

w. Evading or otherwise negating the requirements of paragraph 50.38(1) "*f*," "*g*," "*u*" or "*v*," by terminating the customer relationship for the purpose of soliciting or accepting a loan or gift or being named as a beneficiary, executor or trustee in a will or trust that the agent is otherwise not permitted to solicit or accept. An investment adviser or investment adviser representative will not be in violation of this rule if the investment adviser or investment adviser representative has made a bona fide termination of the client relationship and conducted no securities-related business or other business for a period of three years with the client;

x. Engaging in conduct deemed dishonest or unethical in rule 191—50.55(502); and

y. Employing any method or tactic which uses undue pressure, force, fright, or threat, whether explicit or implied, in connection with providing investment advice, or committing any act which shows that an investment adviser or investment adviser representative has exerted undue influence over a client.

50.38(2) An investment adviser, investment adviser representative, or federal covered investment adviser shall not, directly or indirectly, publish, circulate, or distribute any advertisement that does any one of the following:

a. Refers to any testimonial of any kind concerning the investment adviser, investment adviser representative, or federal covered investment adviser or concerning any advice, analysis, report, or other service rendered by such investment adviser, investment adviser representative, or federal covered investment adviser.

b. Refers to past specific recommendations of the investment adviser, investment adviser representative, or federal covered investment adviser that were or would have been profitable to any person, except that an investment adviser, investment adviser representative, or federal covered investment adviser may furnish or offer to furnish a list of all recommendations made by the investment adviser, investment adviser representative, or federal covered investment adviser within the immediately preceding period of not less than one year if the advertisement or list also includes both of the following:

(1) The name of each security recommended, the date and nature of each recommendation, the market price at that time, the price at which the recommendation was to be acted upon, and the most recently available market price of each such security.

(2) A legend on the first page in prominent print or type that states that the reader should not assume that recommendations made in the future will be profitable or will equal the performance of the securities in the list.

c. Represents that any graph, chart, formula, or other device being offered can in and of itself be used to determine which securities to buy or sell, or when to buy or sell them; or which represents, directly or indirectly, that any graph, chart, formula, or other device being offered will assist any person in making that person's own decisions as to which securities to buy or sell, or when to buy or sell them, without prominently disclosing in such advertisement the limitations thereof and the difficulties with respect to the use of any graph, chart, formula or device.

d. Represents that any report, analysis, or other service will be furnished for free or without charge, unless such report, analysis, or other service actually is or will be furnished entirely free and without any direct or indirect condition or obligation.

e. Represents that the administrator has approved any advertisement.

f. Contains any untrue statement of a material fact, or any statement that is otherwise false or misleading.

50.38(3) With respect to federal covered investment advisers, the provisions of subrule 50.38(2) apply only to the extent permitted by Section 203A of the Investment Advisers Act of 1940.

50.38(4) For the purposes of subrule 50.38(2), the term "advertisement" shall include any notice, circular, letter, or other written communication addressed to more than one person, or any notice or other announcement in any electronic or paper publication, by radio or television, or by any medium, that offers any one of the following:

a. Any analysis, report, or publication concerning securities.

b. Any analysis, report, or publication that is to be used in making any determination as to when to buy or sell any security, or which security to buy or sell.

c. Any graph, chart, formula, or other device to be used in making any determination as to when to buy or sell any security, or which security to buy or sell.

d. Any other investment advisory service with regard to securities.

50.38(5) The prohibitions of rule 191—50.38(502) shall not apply to an investment adviser effecting an agency cross transaction for an advisory client provided the following conditions are met:

a. The advisory client executes a written consent prospectively authorizing the investment adviser to effect agency cross transactions for such client;

b. Before obtaining such written consent from the client, the investment adviser makes full written disclosure to the client that, with respect to agency cross transactions, the investment adviser will act as

broker-dealer for, receive commissions from, and have a potentially conflicting division of loyalties and responsibilities regarding both parties to the transactions;

c. At or before the completion of each agency cross transaction, the investment adviser or any other person relying on subrule 50.38(5) sends the client a written confirmation. The written confirmation shall include:

- (1) A statement of the nature of the transaction;
- (2) The date the transaction took place;
- (3) An offer to furnish, upon request, the time when the transaction took place; and
- (4) The source and amount of any other remuneration the investment adviser received or will receive in connection with the transaction. In the case of a purchase, if the investment adviser was not participating in a distribution, or, in the case of a sale, if the investment adviser was not participating in a tender offer, the written confirmation may state whether the investment adviser has been receiving or will receive any other remuneration and that the investment adviser will furnish the source and amount of such remuneration to the client upon the client's written request;

d. At least annually, and with or as part of any written statement or summary of the account from the investment adviser, the investment adviser or any other person relying on subrule 50.38(5) sends each client a written disclosure statement identifying:

- (1) The total number of agency cross transactions for the client during the period since the date of the last such statement or summary; and
- (2) The total amount of all commissions or other remuneration the investment adviser received or will receive in connection with agency cross transactions for the client during the period;

e. Each written disclosure and confirmation required by subrule 50.38(5) must include a conspicuous statement indicating that the client may revoke the written consent required under paragraph 50.38(5) "a" at any time by providing written notice to the investment adviser;

f. No agency cross transaction may be effected in which the same investment adviser recommended the transaction to both any seller and any purchaser;

g. "Agency cross transaction for an advisory client," for purposes of subrule 50.38(5), means a transaction in which a person acts as an investment adviser in relation to a transaction in which the investment adviser, or any person controlling, controlled by, or under common control with such investment adviser, including an investment adviser representative, acts as a broker-dealer for both the advisory client and for another client on the other side of the transaction. When acting in such capacity, such person acting as an investment adviser, or any person controlling, controlled by, or under common control with such investment adviser, including an investment adviser representative, is required to be registered as a broker-dealer in this state unless excluded from the definition of investment adviser;

h. Nothing in subrule 50.38(5) shall be construed to relieve an investment adviser or investment adviser representative from acting in the best interests of the client, including fulfilling the duty with respect to the best price and execution for the particular transaction for the client, nor shall subrule 50.38(5) relieve any investment adviser or investment adviser representative of any other disclosure obligations imposed by the Act.

This rule is intended to implement Iowa Code section 502.502(2).
[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.39(502) Custody of client funds or securities by investment advisers.

50.39(1) Safekeeping required. It is unlawful and deemed to be a fraudulent, deceptive, or manipulative act, practice, or course of business for an investment adviser, registered or required to be registered, to have custody of client funds or securities unless the following conditions are met:

a. *Notice to administrator.* The investment adviser notifies the administrator promptly in writing that the investment adviser has or may have custody. Such notification is required to be given on Form ADV.

b. *Qualified custodian.* A qualified custodian maintains those funds and securities:

- (1) In a separate account for each client under that client's name; or

(2) In accounts that contain only the investment adviser's clients' funds and securities, under the investment adviser's name as agent or trustee for the clients, or, in the case of a pooled investment vehicle that the investment adviser manages, in the name of the pooled investment vehicle.

c. Notice to clients. If an investment adviser opens an account with a qualified custodian on its client's behalf, under the client's name, under the name of the investment adviser as agent, or under the name of a pooled investment vehicle, the investment adviser must notify the client in writing of the qualified custodian's name and address and the manner in which the funds or securities are maintained, promptly when the account is opened and following any changes to this information. If the investment adviser sends account statements to a client to whom the investment adviser is required to provide this notice, the investment adviser must include in the notification provided to that client and in any subsequent account statement the investment adviser sends that client a statement urging the client to compare the account statements from the custodian with those from the investment adviser.

d. Account statements. The investment adviser has a reasonable basis, after due inquiry, for believing that the qualified custodian sends an account statement, at least quarterly, to each client for which the qualified custodian maintains funds or securities, identifying the amount of funds and of each security in the account at the end of the period and setting forth all transactions in the account during that period.

e. Special rule for limited partnerships and limited liability companies. If the investment adviser or a related person is a general partner of a limited partnership (or managing member of a limited liability company, or holds a comparable position for another type of pooled investment vehicle):

(1) The account statements required under paragraph 50.39(1) "d" must be sent to each limited partner (or member or other beneficial owner); and

(2) The investment adviser must:

1. Enter into a written agreement with an independent party who is obliged to act in the best interest of the limited partners, members, or other beneficial owners to review all fees, expenses and capital withdrawals from the pooled accounts; and

2. Send all invoices or receipts to the independent party, detailing the amount of the fee, expenses or capital withdrawal and the method of calculation such that the independent party can:

- Determine that the payment is in accordance with the pooled investment vehicle standards (generally the partnership agreement or membership agreement); and

- Forward, to the qualified custodian, approval for payment of the invoice with a copy to the investment adviser.

f. Independent verification. The client funds and securities of which the investment adviser has custody are verified by actual examination at least once during each calendar year, by an independent certified public accountant (CPA), pursuant to a written agreement between the investment adviser and the independent CPA, at a time that is chosen by the independent CPA without prior notice or announcement to the investment adviser and that is irregular from year to year. The written agreement must provide for the first examination to occur within six months of execution of the written agreement, except that, if the investment adviser maintains client funds or securities pursuant to rule 191—50.38(502) as a qualified custodian, the agreement must provide for the first examination to occur no later than six months after the investment adviser obtains the internal control report. The written agreement must require the independent CPA to:

(1) File a certificate on Form ADV-E with the administrator within 120 days of the time chosen by the independent CPA in paragraph 50.39(1) "f," stating that the independent CPA has examined the funds and securities and describing the nature and extent of the examination;

(2) Notify the administrator within one business day of the finding of any material discrepancies during the course of the examination, by means of a facsimile transmission or electronic mail, followed by first-class mail, directed to the attention of the administrator; and

(3) File within four business days of the resignation or dismissal from, or other termination of, the engagement, or removing itself or being removed from consideration for being reappointed, Form ADV-E accompanied by a statement that includes:

1. The date of such resignation, dismissal, removal, or other termination, and the name, address, and contact information of the independent CPA; and

2. An explanation of any problems relating to examination scope or procedure that contributed to such resignation, dismissal, removal, or other termination.

g. Investment advisers acting as qualified custodians. If the investment adviser maintains, or if the investment adviser has custody because a related person maintains, client funds or securities pursuant to rule 191—50.39(502) as a qualified custodian in connection with advisory services the investment adviser provides to clients:

(1) The independent CPA that the investment adviser retains to perform the independent verification required by paragraph 50.39(1) “*f*” must be registered with, and subject to regular inspection as of the commencement of the professional engagement period, and as of each calendar year-end, by, the Public Company Accounting Oversight Board in accordance with its rules; and

(2) The investment adviser must obtain, or receive from its related person, within six months of execution of the written agreement and thereafter no less frequently than once each calendar year a written internal control report prepared by an independent CPA.

1. The internal control report must include an opinion of an independent CPA as to whether controls have been placed in operation as of a specific date, and are suitably designed and are operating effectively to meet control objectives relating to custodial services, including the safeguarding of funds and securities held by either the investment adviser or a related person on behalf of the investment adviser’s clients, during the year;

2. The independent CPA must verify that the funds and securities are reconciled to a custodian other than the investment adviser or the investment adviser’s related person; and

3. The independent CPA must be registered with, and subject to regular inspection as of the commencement of the professional engagement period, and as of each calendar year-end, by, the Public Company Accounting Oversight Board in accordance with its rules.

h. Independent representatives. A client may designate an independent representative to receive, on the client’s behalf, notices and account statements as required under paragraphs 50.39(1) “*c*” and “*d*.”

50.39(2) Exceptions.

a. Shares of mutual funds. With respect to shares of an open-end company as defined in Section 5(a)(1) of the Investment Company Act of 1940 (“mutual fund”), the investment adviser may use the mutual fund transfer agent in lieu of a qualified custodian for purposes of complying with subrule 50.39(1).

b. Certain privately offered securities.

(1) The investment adviser is not required to comply with paragraph 50.39(1) “*b*” with respect to securities that are:

1. Acquired from the issuer in a transaction or chain of transactions not involving any public offering;

2. Uncertificated and ownership thereof is recorded only on the books of the issuer or its transfer agent in the name of the client; and

3. Transferable only with prior consent of the issuer or holders of the outstanding securities of the issuer.

(2) Notwithstanding subparagraph 50.39(2) “*b*”(1), the provisions of paragraph 50.39(2) “*b*” are available with respect to securities held for the account of a limited partnership (or limited liability company, or other type of pooled investment vehicle) only if the limited partnership is audited, and the audited financial statements are distributed, as described in paragraph 50.39(2) “*d*,” and the investment adviser notifies the administrator in writing that the investment adviser intends to provide audited financial statements, as described in this subparagraph. Such notification is required to be provided on Form ADV.

c. Fee deduction. Notwithstanding paragraph 50.39(1) “*f*,” an investment adviser is not required to obtain an independent verification of client funds and securities maintained by a qualified custodian if all of the following conditions are met:

(1) The investment adviser has custody of the funds and securities solely as a consequence of its authority to make withdrawals from client accounts to pay its advisory fee;

(2) The investment adviser has written authorization from the client to deduct advisory fees from the account held with the qualified custodian;

(3) Each time a fee is directly deducted from a client account, the investment adviser concurrently:

1. Sends the independent party designated pursuant to subparagraph 50.39(1)“e”(2) an invoice or statement of the amount of the fee to be deducted from the client’s account; and

2. Sends the client an invoice or statement itemizing the fee. Itemization includes the formula used to calculate the fee, the amount of assets under management on which the fee is based, and the time period covered by the fee; and

(4) The investment adviser notifies the administrator in writing that the investment adviser intends to use the safeguards provided in paragraph 50.39(2)“c.” Such notification is required to be given on Form ADV.

d. Limited partnerships subject to annual audit. An investment adviser is not required to comply with paragraphs 50.39(1)“c” and “d” and shall be deemed to have complied with paragraph 50.39(1)“f” with respect to the account of a limited partnership (or limited liability company, or another type of pooled investment vehicle) if each of the following conditions is met:

(1) The adviser sends to all limited partners (or members or other beneficial owners), at least quarterly, a statement showing:

1. The total amount of all additions to and withdrawals from the fund as a whole as well as the opening and closing value of the fund at the end of the quarter based on the custodian’s records;

2. A listing of all long and short positions on the closing date of the statement in accordance with the Financial Accounting Standards Board, Rule ASC 946-210-50; and

3. The total amount of additions to and withdrawals from the fund by the investor as well as the total value of the investor’s interest in the fund at the end of the quarter;

(2) At least annually the fund is subject to an audit and distributes the fund’s audited financial statements prepared in accordance with generally accepted accounting principles to all limited partners (or members or other beneficial owners) and the administrator within 120 days of the end of the fund’s fiscal year;

(3) The audit is performed by an independent CPA that is registered with, and subject to regular inspection as of the commencement of the professional engagement period, and as of each calendar year-end, by, the Public Company Accounting Oversight Board in accordance with its rules;

(4) Upon liquidation, the adviser distributes the fund’s final audited financial statements prepared in accordance with generally accepted accounting principles to all limited partners (or members or other beneficial owners) and the administrator promptly after the completion of such audit;

(5) The written agreement with the independent CPA must require the independent CPA, upon resignation or dismissal from, or other termination of, the engagement, or upon removing itself or being removed from consideration for being reappointed, to notify the administrator within four business days accompanied by a statement that includes:

1. The date of such resignation, dismissal, removal, or other termination, and the name, address, and contact information of the independent CPA; and

2. An explanation of any problems relating to audit scope or procedure that contributed to such resignation, dismissal, removal, or other termination;

(6) The investment adviser must also notify the administrator in writing that the investment adviser intends to employ the use of the statement delivery and audit safeguards described in paragraph 50.39(2)“d.” Such notification is required to be given on Form ADV.

e. Registered investment companies. The investment adviser is not required to comply with rule 191—50.39(502) with respect to the account of an investment company registered under the Investment Company Act of 1940.

50.39(3) Delivery to related persons. Sending an account statement under paragraph 50.39(1)“e” or distributing audited financial statements under paragraph 50.39(2)“d” shall not satisfy the requirements of rule 191—50.39(502) if such account statements or financial statements are sent solely to limited

partners (or members or other beneficial owners) that themselves are limited partnerships (or limited liability companies, or another type of pooled investment vehicle) and are related persons of the investment adviser.

50.39(4) Definitions. For the purposes of this rule:

a. "Control" means the power, directly or indirectly, to direct the management or policies of a person whether through ownership of securities, by contract, or otherwise. "Control" includes the following:

(1) Each of the investment adviser's officers, partners, or directors exercising executive responsibility (or persons having similar status or functions) is presumed to control the investment adviser;

(2) A person is presumed to control a corporation if the person:

1. Directly or indirectly has the right to vote 25 percent or more of a class of the corporation's voting securities; or

2. Has the power to sell or direct the sale of 25 percent or more of a class of the corporation's voting securities;

(3) A person is presumed to control a partnership if the person has the right to receive upon dissolution, or has contributed, 25 percent or more of the capital of the partnership;

(4) A person is presumed to control a limited liability company if the person:

1. Directly or indirectly has the right to vote 25 percent or more of a class of the interests of the limited liability company;

2. Has the right to receive upon dissolution, or has contributed, 25 percent or more of the capital of the limited liability company; or

3. Is an elected manager of the limited liability company; or

(5) A person is presumed to control a trust if the person is a trustee or managing agent of the trust.

b. "Custody" means holding, directly or indirectly, client funds or securities, having any authority to obtain possession of client funds or securities, or having the ability to appropriate client funds or securities. The investment adviser has custody if a related person holds, directly or indirectly, client funds or securities, or has any authority to obtain possession of them, in connection with advisory services the investment adviser provides to clients.

(1) "Custody" includes:

1. Possession of client funds or securities unless received inadvertently and returned to the sender within three business days of receiving them and the investment adviser maintains the records required under paragraph 50.42(1) "v";

2. Any arrangement including, but not limited to, a general power of attorney pursuant to which the investment adviser is authorized or permitted to withdraw client funds or securities maintained with a custodian upon the investment adviser's instruction; and

3. Any capacity including, but not limited to, general partner of a limited partnership, managing member of a limited liability company, a comparable position for another type of pooled investment vehicle, or trustee of a trust that gives the investment adviser or a person supervised by the investment adviser legal ownership of or access to client funds or securities.

(2) Receipt of checks drawn by clients and made payable to third parties will not meet the definition of custody if forwarded to the third party within three business days of receipt and the investment adviser maintains the records required under paragraph 50.42(1) "v."

c. "Independent certified public accountant" means a certified public accountant that meets the standards of independence described in SEC Rule 2-01(b) and (c) of Regulation S-X (17 CFR 210.2-01(b) and (c)).

d. "Independent representative" means a person who:

(1) Acts as agent for an advisory client including, in the case of a pooled investment vehicle, limited partners of a limited partnership, members of a limited liability company, or other beneficial owners of another type of pooled investment vehicle, and who is by law or contract required to act in the best interest of the advisory client or the limited partners or members, or other beneficial owners;

(2) Does not control, is not controlled by, and is not under common control with the investment adviser; and

(3) Does not have and has not had within the past two years a material business relationship with the investment adviser.

e. “Qualified custodian” means the following independent institutions or entities that are not affiliated with the investment adviser by any direct or indirect common control and have not had a material business relationship with the investment adviser in the previous two years:

(1) A bank or savings association that has deposits insured by the Federal Deposit Insurance Corporation under the Federal Deposit Insurance Act;

(2) A broker-dealer registered in Iowa and with the SEC holding client assets in customer accounts;

(3) A registered futures commission merchant registered pursuant to Section 4(f)(a) of the Commodity Exchange Act that is holding client funds and security futures or other securities incidental to transactions in contracts for the purchase or sale of a commodity for future delivery and options thereon in customer accounts; and

(4) A foreign financial institution that customarily holds financial assets for its customers, provided that the foreign financial institution keeps the advisory clients’ assets in customer accounts segregated from its proprietary assets.

f. “Related person” means any person, directly or indirectly, controlling or controlled by the investment adviser, and any person that is under common control with the investment adviser.

This rule is intended to implement Iowa Code section 502.411(5).
[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.40(502) Minimum financial requirements for investment advisers.

50.40(1) An investment adviser registered or required to be registered under the Act that has custody of client funds or securities shall maintain at all times a minimum net worth of \$35,000 except:

a. An investment adviser that has custody solely due to direct fee deduction and that is also in compliance with the applicable safekeeping requirements of paragraph 50.39(2)“*c*” and the record-keeping requirements of rule 191—50.42(502) is not required to comply with the net worth requirements of this rule; and

b. An investment adviser having custody solely due to advising pooled investment vehicles and that is in compliance with the applicable safekeeping requirements of paragraph 50.39(1)“*e*” or 50.39(2)“*d*” and the record-keeping requirements of rule 191—50.42(502) is not required to comply with the net worth requirements of this rule.

50.40(2) An investment adviser registered or required to be registered pursuant to the Act that has discretionary authority over client funds or securities but does not have custody of client funds or securities shall maintain a minimum net worth of \$10,000 at all times.

50.40(3) An investment adviser registered or required to be registered pursuant to the Act shall maintain a positive net worth at all times.

50.40(4) Unless otherwise exempted, an investment adviser registered or required to be registered pursuant to the Act shall notify the administrator if the investment adviser’s net worth is less than the minimum required. Notice must be filed in a report to the administrator no later than the close of business on the next business day following the decrease in net worth. Additionally, an investment adviser shall file by the close of business on the next business day a report with the administrator of the investment adviser’s financial condition including, at a minimum, the following:

a. A trial balance of all ledger accounts;

b. A list of all client funds or securities which are not segregated;

c. A computation of the aggregate amount of client ledger debit balances; and

d. The total number of client accounts managed by the investment adviser.

50.40(5) The administrator may require the submission of a current appraisal for the purpose of establishing the worth of any asset.

50.40(6) An investment adviser that has its principal place of business in a state other than this state is not required to maintain the minimum capital required by this rule provided that the investment adviser

is registered as an investment adviser in the state in which the investment adviser has its principal place of business and is in compliance with that state's laws regarding minimum capital requirements.

50.40(7) For purposes of this rule:

a. "Net worth" means an excess of assets over liabilities calculated in accordance with generally accepted accounting principles. The calculation of assets shall not include the following: prepaid expenses (except those prepaid expenses classified as assets under generally accepted accounting principles); deferred charges, goodwill, franchise rights, organizational expenses, patents, copyrights, marketing rights, unamortized debt discount and expense, and all other assets of intangible nature; in the case of an individual, home(s), home furnishings, automobile(s), or any other personal items not readily marketable; in the case of a corporation, advances or loans to stockholders or officers; and in the case of a partnership, advances or loans to partners.

b. "Custody" means the same as defined in paragraph 50.39(4) "b."

c. An investment adviser shall not be deemed to be exercising discretion when the investment adviser places trade orders with a broker-dealer pursuant to a third-party trading agreement if:

(1) The investment adviser has executed a separate investment adviser contract exclusively with the investment adviser's client which acknowledges that a third-party trading agreement will be executed to allow the investment adviser to effect securities transactions for the client in the client's broker-dealer account;

(2) The investment adviser contract specifically states that the client does not grant discretionary authority to the investment adviser and the investment adviser in fact does not exercise discretion with respect to the account; and

(3) A third-party trading agreement is executed between the client and a broker-dealer which specifically limits the investment adviser's authority in the client's broker-dealer account to the placement of trade orders and deduction of investment adviser fees.

This rule is intended to implement Iowa Code section 502.411(1).

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.41(502) Bonding requirements for investment advisers.

50.41(1) Every investment adviser registered or required to be registered under the Act:

a. Having custody of or discretionary authority over client funds or securities shall be bonded in an amount determined by the administrator based upon the number of clients and the total assets under management of the investment adviser; and

b. Having custody of or discretionary authority over client funds or securities when the investment adviser does not meet the minimum net worth standard provisions of subrules 50.40(1) and 50.40(2) must be bonded in the amount of the net worth deficiency rounded up to the nearest \$5,000.

50.41(2) A bond required by this rule shall be issued by a company qualified to do business in this state in the form determined by the administrator and shall be subject to the claims of clients of the investment adviser regardless of the client's state of residence.

50.41(3) An investment adviser that has a principal place of business in a state other than Iowa is exempt from this rule provided that the investment adviser is registered as an investment adviser in the state in which the investment adviser has its principal place of business and is in compliance with that state's laws regarding bonding requirements.

50.41(4) For purposes of this rule, "custody" means the same as defined in paragraph 50.39(4) "b."

This rule is intended to implement Iowa Code section 502.411(5).

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.42(502) Record-keeping requirements for investment advisers.

50.42(1) An investment adviser registered or required to be registered pursuant to the Act shall make and keep true, accurate and current the following books, ledgers and records:

a. A journal or journals, including cash receipts and disbursements records, and any other records of original entry forming the basis of any ledger entries.

b. General and auxiliary ledgers (or other comparable records) reflecting asset, liability, reserve, capital, income, and expense accounts.

c. A memorandum of each order given by the investment adviser for the purchase or sale of any security, of any instruction received by the investment adviser from the client concerning the purchase, sale, receipt or delivery of a particular security, and of any modification or cancellation of any such order or instruction. The memorandum shall describe the terms and conditions of the order, instruction, modification or cancellation; identify the person connected with the investment adviser who recommended the transaction to the client and the person who placed the order; indicate whether discretionary power was exercised; and indicate the account for which entered, the date of entry, and, where applicable, the bank or broker-dealer by or through whom executed.

d. All checkbooks, bank statements, canceled checks and cash reconciliations of the investment adviser.

e. All invoices, bills, or statements, or copies of those documents, relating to the investment adviser's business as an investment adviser regardless of whether the expense or debt is paid or unpaid.

f. All trial balances, financial statements, and internal audit working papers relating to the investment adviser's business as an investment adviser. For the purposes of this paragraph, "financial statements" means a balance sheet prepared in accordance with generally accepted accounting principles, an income statement, a cash flow statement, and a net worth computation, if applicable, as required by subrule 50.40(7).

g. Originals of all written communications received by and copies of all written communications sent by the investment adviser relating to:

(1) Any recommendation made or proposed to be made and any advice given or proposed to be given;

(2) Any receipt, disbursement, or delivery of funds or securities; or

(3) The placing or execution of any order to purchase or sell any security, except:

1. The investment adviser shall not be required to keep any unsolicited market letters and other similar communications of general public distribution not prepared by or for the investment adviser; and

2. The investment adviser is not required to keep a record of the names and addresses of persons to whom a notice, circular, or other advertisement offering any report, analysis, publication or other investment advisory service is sent if sent to more than ten persons; however, if the notice, circular, or other advertisement is distributed to persons named on any list, the investment adviser must retain with the copy of the notice, circular, or advertisement a memorandum describing the list and its source.

h. A list or other record of all accounts identifying the accounts in which the investment adviser is vested with any discretionary power with respect to the funds, securities or transactions of any client.

i. Copies of all powers of attorney and other documents granting discretionary authority by any client to the investment adviser.

j. Copies of each agreement entered into by the investment adviser with any client, and all other written agreements otherwise relating to the investment adviser's business as an investment adviser.

k. A file containing copies of each notice, circular, advertisement, newspaper article, investment letter, bulletin, or other communication including electronic media that the investment adviser circulates or distributes, directly or indirectly, to two or more persons not affiliated with the investment adviser and, if the notice, circular, advertisement, newspaper article, investment letter, bulletin, or other communication including one in electronic media format recommends the purchase or sale of a specific security and does not state the reasons for the recommendation, a memorandum indicating the investment adviser's reasons for the recommendation.

l. Transactions involving beneficial ownership.

(1) A record of every transaction in a security in which the investment adviser or any advisory representative of the investment adviser has or by reason of any transaction acquires a direct or indirect beneficial ownership, except the following:

1. Transactions effected in any account over which neither the investment adviser nor any advisory representative of the investment adviser has any direct or indirect influence or control; and

2. Transactions in securities which are direct obligations of the United States.

(2) The required record shall state, at a minimum, the title and amount of the security involved, the date and nature of the transaction (i.e., purchase, sale or other acquisition or disposition), the price

at which the transaction was effected, and the name of the bank or broker-dealer with or through which the transaction was effected. The record may also contain a statement declaring that the reporting or recording of any transaction shall not be construed as an admission that the investment adviser or advisory representative has any direct or indirect beneficial ownership in the security. A transaction must be recorded no later than ten days after the end of the calendar quarter in which the transaction was effected. An investment adviser shall not be in violation of this paragraph because of a failure to record securities transactions of an advisory representative if the investment adviser establishes that the investment adviser instituted adequate procedures and used reasonable diligence to promptly obtain reports of all transactions required by this paragraph to be recorded.

m. Notwithstanding the provisions of paragraph 50.42(1)“l,” when the investment adviser is primarily engaged in a business or businesses other than advising investment advisory clients, a record must be maintained of every transaction in a security in which the investment adviser or any advisory representative of the investment adviser has, or by reason of any transaction acquires, any direct or indirect beneficial ownership, except:

(1) Transactions effected in any account over which neither the investment adviser nor any advisory representative of the investment adviser has any direct or indirect influence or control; or

(2) Transactions in securities which are direct obligations of the United States.

The record shall state the title and amount of the security involved, the date and nature of the transaction (i.e., purchase, sale, or other acquisition or disposition), the price at which it was effected, and the name of the broker-dealer or bank with or through which the transaction was effected. The record may also contain a statement declaring that the reporting or recording of any transaction shall not be construed as an admission that the investment adviser or advisory representative has any direct or indirect beneficial ownership in the security. A transaction shall be recorded not later than ten days after the end of the calendar quarter in which the transaction was effected. An investment adviser shall not be deemed to have violated the provisions of this subparagraph because of a failure to record securities transactions of an advisory representative if the investment adviser establishes that the investment adviser instituted adequate procedures and used reasonable diligence to promptly obtain reports of all transactions required to be recorded.

n. A copy of each written statement and each amendment or revision, given or sent to any client or prospective client of the investment adviser in accordance with rule 191—50.36(502), and a record of the dates on which each written statement, amendment and revision was given or offered to be given to any client or any prospective client who subsequently becomes a client.

o. For each client that was obtained by the investment adviser by means of a solicitor to whom a cash fee was paid by the investment adviser:

(1) A copy of any written agreement relating to the payment of a cash fee to which the investment adviser is a party;

(2) A signed and dated acknowledgment of receipt from the client evidencing the client’s receipt of the investment adviser’s disclosure statement and a written disclosure statement of the solicitor; and

(3) A copy of the solicitor’s written disclosure statement.

The written agreement, acknowledgment and solicitor disclosure statement will be deemed to be in compliance if such documents comply with Rule 275.206(4)-3 of the Investment Advisers Act of 1940.

p. All accounts, books, internal working papers, and any other records or documents that are necessary to form the basis for or demonstrate the calculation of the performance or rate of return of all managed accounts or securities recommendations provided in any notice, circular, advertisement, newspaper article, investment letter, bulletin, or other communication, including electronic media, that is directly or indirectly circulated or distributed by the investment adviser to two or more persons (other than persons connected with the investment adviser). However, with respect to the performance of managed accounts only, the retention of all account statements reflecting all debits, credits, and other transactions in a client’s account for the period of the statement, and the retention of all worksheets necessary to demonstrate the calculation of the performance or rate of return of the managed account shall satisfy the requirements of this paragraph.

q. A file containing copies of all written communications received or sent regarding any litigation or customer or client complaints involving the investment adviser or any investment adviser representative or employee.

r. The basis, in writing, for any recommendation or investment advice provided to an investment advisory client.

s. Copies of all written procedures regarding the supervision of the employees and investment adviser representatives that are reasonably designed to achieve compliance with securities laws and regulations.

t. A file containing a copy of each document (other than any notices of general dissemination) that was filed with or received from any state or federal agency or self-regulatory organization pertaining to the investment adviser or its investment adviser representatives, as defined by subrule 50.42(11), including but not limited to all applications, amendments, renewal filings, and correspondence.

u. Original copies signed by the lawful signatory of the investment adviser and the investment adviser representative of each initial Form U-4 and each U-4 Amendment to Disclosure Reporting Pages (DRPs).

v. For each transaction in which the investment adviser inadvertently held or obtained the client's securities or funds and returned them to the client within three business days of receipt or forwarded a check drawn by a client and made payable to a third party within three business days of receipt, a ledger or list of all funds or securities held or obtained with the following information:

- (1) Issuer;
- (2) Type of security and series;
- (3) Date of issue;
- (4) For debt instruments, the denomination, interest rate and maturity date;
- (5) Certificate number, including alphabetical prefix or suffix;
- (6) Name in which registered;
- (7) Date submitted to the investment adviser;
- (8) Date sent to client or sender;
- (9) Form of delivery to client or sender, or copy of the form of delivery to client or sender; and
- (10) Mail confirmation number, if applicable, or confirmation by client or sender of the return of the security or fund.

w. If an investment adviser obtains possession of securities that are acquired from the issuer in a transaction or chain of transactions not involving a public offering that comply with the exception from custody in paragraph 50.39(2) "b," the adviser shall keep:

(1) A record showing the issuer's or current transfer agent's name, address, telephone number, and other applicable contact information pertaining to the party responsible for recording the client's interests in the securities; and

(2) A copy of any legend, shareholder agreement, or other agreement providing that the securities are transferable only with prior consent of the issuer or holders of the outstanding securities of the issuer.

x. A copy of a written business continuity and succession plan as required by rule 191—50.47(502).

50.42(2) In addition to the retention requirements of subrule 50.42(1), an investment adviser having custody of client funds or securities, as defined by paragraph 50.39(3) "b," shall retain the following records:

a. Copies of all documents executed by each client, including but not limited to a limited power of attorney, pursuant to which the investment adviser is authorized or permitted to withdraw a client's funds or securities maintained with a custodian upon the adviser's instruction to the custodian;

b. A journal or other record for all accounts reflecting all purchases, sales, receipts, and deliveries of securities, including but not limited to certificate numbers, and all other debits and credits to the accounts;

c. A separate ledger account for each client showing all purchases, sales, receipts and deliveries of securities, the date and price of each purchase or sale, and all debits and credits;

d. Copies of confirmations of all transactions effected by or for the account of any client;

e. A record for each security in which any client has a position showing, at a minimum, the name of each client having an interest in the security, the amount of interest of each client in the security, and the location of each security;

f. A copy of each client's quarterly account statements as generated and delivered by the qualified custodian. Additionally, if the investment adviser generates a statement that is delivered to the client, the investment adviser shall retain copies of those statements along with information indicating the dates on which the statements were provided to the client;

g. If applicable, a copy of the special examination report, financial statements, and letter verifying the completion of and describing the nature and extent of an examination by an independent certified public accountant and documentation describing the nature and extent of the examination and a record regarding any findings of any material discrepancies found during the examination; and

h. If applicable, evidence of the client's designation of an independent representative.

50.42(3) An investment adviser deemed to have custody of client securities or funds because the investment adviser advises a pooled investment vehicle shall, in addition to any other applicable record retention requirements, keep the following records:

a. True, accurate, and current account statements;

b. If utilizing the exception provided by paragraph 50.39(2) "c," the date(s) of the audit, a copy of the audited financial statements, and evidence of the mailing of the audited financial statements to all limited partners, members, or other beneficial owners within 120 days of the end of the fiscal year;

c. If subject to paragraph 50.39(1) "e," a copy of the written agreement with the independent party reviewing all fees and expenses and describing the responsibilities of the independent third party, and copies of all invoices and receipts showing approval by the independent third party for payment through the qualified custodian.

50.42(4) Each investment adviser subject to subrule 50.42(1) that renders investment supervisory or management services to any client shall, with respect to the portfolio being supervised or managed and to the extent that the information is reasonably available to or obtainable by the investment adviser, retain the following records:

a. For each client, detailed information regarding the securities purchased and sold including, but not limited to, the date of the purchase or sale, the total dollar amount of the purchase or sale, and the price at which the security was purchased or sold.

b. For each security in which any client has a current position, the name of each client and current amount or interest of the client.

50.42(5) Records required to be retained pursuant to rule 191—50.42(502) shall be kept as follows:

a. Except as provided in paragraphs 50.42(1) "k" and "p," all records required to be made under subrules 50.42(1) to 50.42(3) and paragraph 50.42(4) "a" shall be maintained and preserved in a readily accessible location for a period of not less than five years from the end of the fiscal year during which the last entry was made on record, with no less than the first two years being kept in the principal office of the investment adviser.

b. Partnership articles and any amendments, articles of incorporation, charters, minute books, and stock certificate books of the investment adviser and of any predecessor shall be maintained in the principal office of the investment adviser and preserved until at least three years after termination of the enterprise.

c. Books and records required to be retained pursuant to paragraphs 50.42(1) "k" and 50.42(1) "p" shall be maintained and preserved in a readily accessible location for a period of not less than five years from the end of the fiscal year during which the investment adviser last published or otherwise disseminated, directly or indirectly, the notice, circular, advertisement, newspaper article, investment letter, bulletin, or other communication including by electronic media, with no less than the first two years being kept in the principal office of the investment adviser.

d. Books and records required to be retained pursuant to paragraphs 50.42(1) "q" to "v" shall be maintained and preserved in a readily accessible location for a period of not less than five years from the end of the fiscal year during which the last entry was made on such record, with no less than the first

two years being kept in the principal office of the investment adviser, or the time period during which the investment adviser is registered or required to be registered in this state, whichever is less.

e. Notwithstanding other record preservation requirements of rule 191—50.42(502), an investment adviser that has rendered or renders investment advisory services shall maintain at all times the following records at the investment adviser's business location from which the customer or client is being provided or has been provided investment advisory services during the applicable retention period:

(1) All records required to be preserved pursuant to paragraphs 50.42(1)“*c*,” “*g*” to “*j*,” “*n*,” “*o*,” and “*q*” to “*s*” and subrules 50.42(2) to 50.42(4); and

(2) All records required pursuant to paragraphs 50.42(1)“*k*” to “*p*” identifying the name of the investment adviser representative providing investment advice from that business location, or identifying the physical address, mailing address, electronic mailing address, or telephone number of the business location. The records will be maintained for the period described in paragraph 50.42(5)“*a*.”

50.42(6) An investment adviser subject to subrule 50.42(1) that ceases to conduct or discontinues business as an investment adviser shall arrange for and be responsible for the retention of the records required to be retained pursuant to this rule for the applicable retention period. The investment adviser shall notify the administrator in writing prior to ceasing to conduct or discontinuing business as an investment adviser of the exact address where the books and records will be maintained during the retention period.

50.42(7) An investment adviser required to retain records pursuant to this rule may maintain the records in such manner that the identity of any client to whom the investment adviser renders investment supervisory services is indicated by numerical code, alphabetical code, or similar designation.

50.42(8) Record maintenance.

a. Pursuant to subrule 50.42(4), the records required to be maintained and preserved may be immediately produced or reproduced, and maintained and preserved for the required time, by an investment adviser in:

- (1) Paper or hard-copy form, as those records are kept in their original form; or
- (2) Micrographic media, including microfilm, microfiche, or any similar medium; or
- (3) Electronic storage media, including any digital storage medium or system, that meet the terms of this subrule.

b. The investment adviser must:

- (1) Arrange and index the records in a way that permits easy location, access, and retrieval of any particular record;
- (2) Provide promptly any of the following that the administrator may request:
 1. A legible, true, and complete copy of the record in the medium and format in which it is stored;
 2. A legible, true, and complete printout of the record; and
 3. Means to access, view, and print the records; and
- (3) Separately store, for the time required for preservation of the original record, a duplicate copy of the record in any medium allowed by this subrule.

c. In the case of records created or maintained in electronic storage media, the investment adviser must establish and maintain procedures:

- (1) To maintain and preserve the records, so as to reasonably safeguard them from loss, alteration, or destruction;
- (2) To limit access to the records to properly authorized personnel and the administrator; and
- (3) To reasonably ensure that any reproduction of a nonelectronic original record in electronic storage media is complete, true, and legible when retrieved.

50.42(9) Compliance with any substantially similar record-keeping requirements of SEC Rules 17a-3 and 17a-4 (17 CFR 240.17a-3 and 17 CFR 240.17a-4) shall be deemed to be in compliance with this rule.

50.42(10) Every investment adviser that is registered or required to be registered in this state and that has its principal place of business in a state other than this state shall be exempt from the requirements

of this rule, provided the investment adviser is properly registered in that state and is in compliance with that state's record-keeping requirements.

50.42(11) For purposes of this rule:

"Advisory representative" means any partner, officer or director of the investment adviser; any employee who participates in any way in the determination of which recommendations shall be made; any employee who, in connection with the employee's duties, obtains any information concerning which securities are being recommended prior to the effective dissemination of the recommendations; and any of the following persons who obtain information concerning securities recommendations being made by the investment adviser prior to the effective dissemination of the recommendations:

1. Any person in a relationship of control with the investment adviser;
2. Any person affiliated with a controlling person; and
3. Any person affiliated with an affiliated person.

"Control" means the power to exercise a controlling influence over the management or policies of a company, unless that power results solely from an official position with the company. Any person who owns beneficially, either directly or through one or more controlled companies, more than 25 percent of the voting securities of a company shall be presumed to control the company.

An investment adviser shall not be deemed to be exercising a discretionary power as to the price at which or the time when a transaction is effected or is to be effected if, before the order is given by the investment adviser, the client has directed or approved the purchase or sale of a definite amount of the particular security.

"Investment adviser primarily engaged in a business or businesses other than advising investment advisory clients" means an investment adviser that for each of the most recent three fiscal years or for the period of time since organization, whichever is less, derives on an unconsolidated basis more than 50 percent of total sales and revenues and income (or loss) before income taxes and extraordinary items from business activities other than advising investment advisory clients.

"Investment supervisory services" means continuous advice regarding investment of funds provided to each client on the basis of the individual needs of the client.

"Solicitor" means any person or entity that for compensation acts as an agent of an investment adviser in referring potential clients.

This rule is intended to implement Iowa Code section 502.411(3).
[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.43(502) Financial reporting requirements for investment advisers.

50.43(1) Every registered investment adviser that has custody of client funds or securities or requires payment of advisory fees six months or more in advance and in excess of \$500 per client shall file with the administrator an audited balance sheet as of the end of the investment adviser's fiscal year. Each balance sheet filed pursuant to this rule must be:

- a. Examined in accordance with generally accepted auditing standards and prepared in conformity with generally accepted accounting principles;
- b. Audited by an independent certified public accountant; and
- c. Accompanied by an opinion of the accountant as to the report of financial position, and by a note stating the principles used to prepare the opinion, the basis of included securities, and any other explanations required for clarity.

50.43(2) Every registered investment adviser that has discretionary authority over, but not custody of, client funds or securities shall file with the administrator a balance sheet, which need not be audited, but which must be prepared in accordance with generally accepted accounting principles or such other basis of accounting acceptable to the administrator and represented by the investment adviser or the person who prepared the statement as true and accurate, as of the end of the investment adviser's fiscal year.

50.43(3) The financial statements required by this rule shall be filed with the administrator within 90 days following the end of the investment adviser's fiscal year.

50.43(4) Every investment adviser that has its principal place of business in a state other than this state shall file only such reports as required by the state in which the investment adviser maintains its principal place of business, provided the investment adviser is licensed in such state and is in compliance with such state's financial reporting requirements.

This rule is intended to implement Iowa Code section 502.411(2).
[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.44(502) Solely incidental services by certain professionals.

50.44(1) General approach.

a. Certain professionals may rely on an exclusion from the definition of “investment adviser” contained in Iowa Code section 502.102(15)“b” for lawyers, accountants, engineers or teachers whose performance of investment advice is solely incidental to the practice of the person's profession. Whether the exclusion from the definition of “investment adviser” is available to a lawyer, accountant, engineer or teacher providing investment advisory services within the meaning of Iowa Code section 502.102(15)“b” depends upon the relevant facts and circumstances.

b. In general, the administrator will determine whether the investment advisory services provided and the fees charged are solely incidental to the total services provided to the individual client by comparing whether the aggregate of such fees and services is solely incidental to the aggregate of services provided to all clients. In addition, the administrator will take other relevant factors into consideration in determining the applicability of the exclusion including, but not limited to, whether the firm establishes a separate subsidiary, division, or other business entity to perform advisory services or maintains an investment adviser registration with the U.S. Securities and Exchange Commission under the Investment Advisers Act of 1940. In this context, the administrator would refer to U.S. Securities and Exchange Commission Release IA-1092 relating to the analogous exclusion in the Investment Advisers Act of 1940 which states that “. . . the exclusion . . . is not available . . . to a lawyer or accountant who holds himself out to the public as providing financial planning, pension consulting, or other financial advisory services. In such a case it would appear that the performance of investment advisory services by the person would not be solely incidental to his practice as a lawyer or accountant.”

50.44(2) General versus specific advice. A lawyer, accountant, engineer or teacher, whether or not holding oneself out to the public as providing financial planning or other financial advisory services, who does not render advice with respect to investing in specific securities, types of securities, or categories of securities need not register as an investment adviser. Registration is not required when the securities advice provided to clients in this state is limited to a general recommendation that the client should be more aggressive or more conservative in securities investments, a general recommendation as to the percentage of the client's assets that should be in securities, or a general recommendation that the client pursue an income-producing or growth-oriented investment strategy, provided the recommendation does not identify specific securities, types of securities, or categories of securities. For the purpose of this subrule, the phrase “types of securities” means classes of securities in which the issuer is not specifically identified, such as common stock, preferred stock, options, warrants, bonds, and mutual funds, and the phrase “categories of securities” means general areas of securities investments where neither the issuer nor the types of securities are identified such as cyclical securities, automotive industry securities, international securities, and NYSE securities. Asset allocation recommendations, however, generally do include advice on types of securities.

EXAMPLE: An accountant provides clients accounting and financial planning services. No advice with respect to specific securities, types of securities, or categories of securities is provided. The accountant need not register as an investment adviser.

50.44(3) Professional does not hold self out as a financial planner. When the securities advice is provided by a lawyer, accountant, engineer, or teacher who does not hold oneself out to the public as providing financial planning or other financial advisory services, the availability of the exclusion from the definition of “investment adviser” contained in Iowa Code section 502.102(15)“b” for securities advice rendered solely incidental to the profession will depend on those factors set forth in paragraph 50.44(1)“b.”

EXAMPLE A: An accountant who does not hold oneself out to the public as providing financial planning or other financial advisory services provides the client both accounting and financial planning services. The services involve advice with respect to specific securities, types of securities, or categories of securities. Whether the accountant is excluded from the definition of investment adviser depends on those factors set forth in paragraph 50.44(1)“b,” including a comparison of the extent of the securities advisory services provided to any client as contrasted with the accounting services provided to that client. The comparison is measured by the compensation paid for each service.

EXAMPLE B: An accountant provides a client financial planning services only. The financial planning services involve advice with respect to specific securities, types of securities, or categories of securities. The accountant is not excluded from the definition of investment adviser and therefore must register as an investment adviser.

50.44(4) *Professional holds self out as a financial planner.*

a. If the investment advice provided by a lawyer, accountant, engineer, or teacher who holds oneself out to the public as providing financial planning or other financial advisory services is part of the financial plan being provided to a financial planning client, the professional cannot rely on the exclusion from the definition of “investment adviser” contained in Iowa Code section 502.102(15)“b” for investment advice rendered incidentally to the practice of the profession.

EXAMPLE: An accountant who holds oneself out to the public as providing financial planning or other financial advisory services provides the client both accounting and financial planning services. The financial planning services involve advice with respect to specific securities, types of securities, or categories of securities. The accountant is not excluded from the definition of investment adviser no matter how insignificantly the securities advice compares to the other financial planning advice or accounting services rendered.

b. When a lawyer, accountant, engineer, or teacher holding oneself out to the public as providing financial planning or other financial advisory services does not provide advice on specific securities, types of securities, or categories of securities as part of financial planning services but provides such advice in connection with the practice of the profession, in most instances the exclusion from the definition of investment adviser would be unavailable because the professional is holding oneself out as a financial planner or financial adviser. If, however, securities advice is not part of financial planning services and is both limited and isolated, the exclusion may still be available.

EXAMPLE: An accountant who holds oneself out to the public as providing financial planning or other financial advisory services provides clients both accounting and financial planning services. No securities advice is rendered as part of the financial planning services. Clients, on a few occasions, request the accountant’s advice on investing in certain limited partnerships. The fees charged to such a client for the advice total only a small percentage of the fees charged to that client for accounting services provided. The accountant is excluded from the definition of investment adviser. The example presented is intentionally narrow in order to illustrate that once the accountant holds oneself out as a financial planner or financial adviser, even if the only securities advice provided for compensation is not part of the financial planning or advisory activities, only limited and isolated securities advice may be provided without registration as an investment adviser.

This rule is intended to implement Iowa Code section 502.102(15)“b.”

191—50.45(502) Registration exemption for investment advisers to private funds.

50.45(1) *Definitions.* For purposes of this rule, the following definitions shall apply:

“3(c)(1) fund” means a qualifying private fund that is eligible for the exclusion from the definition of an investment company under the Investment Company Act of 1940 (15 U.S.C. Section 80a-3(c)(1)).

“Private fund adviser” means an investment adviser who provides advice solely to one or more qualifying private funds.

“Qualifying private fund” means a private fund that meets the definition of a qualifying private fund in SEC Rule 203(m)-1 (17 CFR 275.203(m)-1).

“Value of primary residence” means the fair market value of a person’s primary residence, less the amount of debt secured by the property up to its fair market value.

“*Venture capital fund*” means a private fund that meets the definition of a venture capital fund in SEC Rule 203(l)-1 (17 CFR 275.203(l)-1).

50.45(2) Exemption for private fund advisers. Subject to the additional requirements of subrule 50.45(3), a private fund adviser shall be exempt from the registration requirements of Iowa Code section 502.403 if the private fund adviser satisfies each of the following conditions:

a. Neither the private fund adviser nor any of its advisory affiliates are subject to a disqualification as described in SEC Rule 262 of Regulation A (17 CFR 230.262).

b. The private fund adviser files with the state each report and amendment thereto that an exempt reporting adviser is required to file with the SEC pursuant to SEC Rule 204-4 (17 CFR 275.204-4).

c. The private fund adviser pays any applicable fees.

50.45(3) Additional requirements for private fund advisers to certain 3(c)(1) funds. In order to qualify for the exemption described in subrule 50.45(2), a private fund adviser who advises at least one 3(c)(1) fund that is not a venture capital fund shall, in addition to satisfying each of the conditions specified in paragraph 50.45(3)“*b*,” comply with the following requirements:

a. The private fund adviser shall advise only those 3(c)(1) funds (other than venture capital funds) whose outstanding securities (other than short-term paper) are beneficially owned entirely by persons who, after deducting the value of the primary residence from the person’s net worth, would each meet the definition of a qualified client in SEC Rule 205-3 (17 CFR 275.205-3) at the time the securities are purchased from the issuer.

b. At the time of purchase, the private fund adviser shall disclose the following in writing to each beneficial owner of a 3(c)(1) fund that is not a venture capital fund:

(1) All services, if any, to be provided to individual beneficial owners;

(2) All duties, if any, the private fund adviser owes to the beneficial owners; and

(3) Any other material information affecting the rights or responsibilities of the beneficial owners.

c. The private fund adviser shall obtain on an annual basis audited financial statements of each 3(c)(1) fund that is not a venture capital fund and shall deliver a copy of such audited financial statements to each beneficial owner of the fund.

50.45(4) Federal covered investment advisers. If a private fund adviser is registered with the SEC, the adviser shall not be eligible for this exemption and shall comply with the state notice filing requirements applicable to federal covered investment advisers.

50.45(5) Investment adviser representatives. A person is exempt from the registration requirements if the person is employed by or associated with an investment adviser that is exempt from registration in this state pursuant to rule 191—50.45(502) and does not otherwise act as an investment adviser representative.

50.45(6) Electronic filing. The report filings described in paragraph 50.45(2)“*b*” shall be made electronically through the IARD. A report shall be deemed filed when the report and the fee required are filed and accepted by the IARD on the state’s behalf.

50.45(7) Transition. An investment adviser that becomes ineligible for the exemption provided by rule 191—50.45(502) must comply with all applicable laws and rules requiring registration or notice filing within 90 days from the date the investment adviser’s eligibility for this exemption ceases.

50.45(8) Grandfathering for investment advisers to 3(c)(1) funds with nonqualified clients. An investment adviser to a 3(c)(1) fund (other than a venture capital fund) that has one or more beneficial owners who are not qualified clients as described in paragraph 50.45(3)“*a*” is eligible for the exemption contained in subrule 50.45(2) if the following conditions are satisfied:

a. The subject fund existed prior to November 6, 2013;

b. As of November 6, 2013, the subject fund ceases to accept beneficial owners who are not qualified clients, as described in paragraph 50.45(3)“*a*”;

c. The investment adviser discloses in writing the information described in paragraph 50.45(3)“*b*” to all beneficial owners of the fund; and

d. As of November 6, 2013, the investment adviser delivers audited financial statements as required by paragraph 50.43(3)“c.”

This rule is intended to implement Iowa Code section 502.403.
[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.46(502) Contents of investment advisory contract. The provisions of this rule shall apply to federal covered investment advisers to the extent that the conduct alleged is fraudulent, deceptive, or as otherwise permitted by the National Securities Markets Improvement Act of 1996.

50.46(1) It is unlawful for any investment adviser, investment adviser representative, or federal covered investment adviser to enter into, extend, or renew any investment advisory contract unless it provides in writing:

a. The services to be provided, the term of the contract, the investment advisory fee, the formula for computing the fee, the amount of prepaid fee to be returned in the event of termination or nonperformance of the contract, and any grant of discretionary power to the investment adviser, investment adviser representative, or federal covered investment adviser;

b. That no direct or indirect assignment or transfer of the contract may be made by the investment adviser, investment adviser representative, or federal covered investment adviser without the consent of the client or other party to the contract;

c. That the investment adviser, investment adviser representative, or federal covered investment adviser shall not be compensated on the basis of a share of capital gains upon or capital appreciation of the funds or any portion of the funds of the client;

d. That the investment adviser, investment adviser representative, or federal covered investment adviser, if a partnership, shall notify the client or other party to the investment contract of any change in the membership of the partnership within a reasonable time after the change.

50.46(2) It is unlawful for any investment adviser, investment adviser representative, or federal covered investment adviser to:

a. Include in an advisory contract any condition, stipulation, or provisions binding any person to waive compliance with any provision of this Act or of the Investment Advisers Act of 1940, or any other practice contrary to the provisions of Section 215 of the Investment Advisers Act of 1940; or

b. Enter into, extend or renew any advisory contract contrary to the provisions of Section 205 of the Investment Advisers Act of 1940. This provision shall apply to all advisers and investment adviser representatives registered or required to be registered under this Act, notwithstanding whether such adviser or representative would be exempt from federal registration pursuant to Section 203(b) of the Investment Advisers Act of 1940.

50.46(3) Notwithstanding paragraph 50.46(1)“c,” an investment adviser may enter into, extend or renew an investment advisory contract which provides for compensation to the investment adviser on the basis of a share of capital gains upon or capital appreciation of the funds, or any portion of the funds, of the client if the conditions in paragraphs 50.46(3)“a” to “d” are met.

a. The client entering into the contract must be:

(1) A natural person or a company that, immediately after entering into the contract, has at least \$750,000 under the management of the investment adviser; or

(2) A person that the investment adviser and its investment adviser representatives reasonably believe, immediately before entering into the contract, is a natural person or a company whose net worth, at the time the contract is entered into, exceeds \$1,500,000. The net worth of a natural person may include assets held jointly with that person’s spouse.

b. The compensation paid to the investment adviser with respect to the performance of any securities over a given period must be based on a formula with the following characteristics:

(1) In the case of securities for which market quotations are readily available within the meaning of Rule 2a-4(a)(1) under the Investment Company Act of 1940 (definition of “current net asset value” for use in computing periodically the current price of redeemable security), the formula must include the realized capital losses and unrealized capital depreciation of the securities over the period;

(2) In the case of securities for which market quotations are not readily available within the meaning of Rule 2a-4(a)(1) under the Investment Company Act of 1940, the formula must include:

1. The realized capital losses of securities over the period; and
2. If the unrealized capital appreciation of the securities over the period is included, the unrealized capital depreciation of the securities over the period; and

(3) The formula must provide that any compensation paid to the investment adviser under paragraph 50.46(3) “b” is based on the gains less the losses (computed in accordance with subparagraphs 50.46(3) “b”(1) and (2)) in the client’s account for a period of not less than one year.

c. Before entering into the advisory contract and in addition to the requirements of Form ADV, the investment adviser must disclose in writing to the client or the client’s independent agent all material information concerning the proposed advisory arrangement, including the following:

(1) That the fee arrangement may create an incentive for the investment adviser to make investments that are riskier or more speculative than would be the case in the absence of a performance fee;

(2) Where relevant, that the investment adviser may receive increased compensation with regard to unrealized appreciation as well as realized gains in the client’s account;

(3) The periods which will be used to measure investment performance throughout the contract and their significance in the computation of the fee;

(4) The nature of any index which will be used as a comparative measure of investment performance, the significance of the index, and the reason the investment adviser believes that the index is appropriate; and

(5) When the investment adviser’s compensation is based in part on the unrealized appreciation of securities for which market quotations are not readily available within the meaning of Rule 2a-4(a)(1) under the Investment Company Act of 1940, how the securities will be valued and the extent to which the valuation will be independently determined.

d. The investment adviser (and any investment adviser representative) that enters into the contract must reasonably believe, immediately before entering into the contract, that the contract represents an arm’s length arrangement between the parties and that the client (or in the case of a client which is a company as defined in paragraph 50.46(6) “d,” the person representing the company), alone or together with the client’s independent agent, understands the proposed method of compensation and its risks. The representative of a company may be a partner, director, officer or an employee of the company or of the trustee, where the company is a trust, or any other person designated by the company or trustee, but must satisfy the definition of client’s independent agent set forth in paragraph 50.46(6) “c.”

50.46(4) Any person entering into or performing an investment advisory contract under rule 191—50.46(502) is not relieved of any obligations under rule 191—50.38(502) or any other applicable provision of the Act or any rule or order thereunder.

50.46(5) Nothing in rule 191—50.46(502) shall relieve a client’s independent agent from any obligation to the client under applicable law.

50.46(6) The following definitions apply for purposes of rule 191—50.46(502):

a. “*Affiliate*” shall have the same definition as in Section 2(a)(3) of the Investment Company Act of 1940.

b. “*Assignment*,” as used in paragraph 50.46(1) “b,” includes, but is not limited to, any transaction or event that results in any change to the individuals or entities with the power, directly or indirectly, to direct the management or policies of, or to vote more than 50 percent of any class of voting securities of, the investment adviser or federal covered investment adviser as compared to the individuals or entities that had such power as of the date when the contract was first entered into, extended or renewed.

c. “*Client’s independent agent*” means any person who agrees to act as an investment advisory client’s agent in connection with the contract. “*Client’s independent agent*” does not include:

(1) The investment adviser relying on rule 191—50.46(502);

(2) An affiliated person of the investment adviser or an affiliated person of an affiliated person of the investment adviser including an investment adviser representative;

(3) An interested person of the investment adviser;

(4) A person who receives, directly or indirectly, any compensation in connection with the contract from the investment adviser, an affiliated person of the investment adviser, an affiliated person of an affiliated person of the investment adviser or an interested person of the investment adviser; or

(5) A person with any material relationship between the person (or an affiliated person of that person) and the investment adviser (or an affiliated person of the investment adviser) that exists, or has existed at any time during the past two years.

d. "Company" means a corporation, partnership, association, joint stock company, trust, or any organized group of persons, whether incorporated or not; or any receiver, trustee in a case under Title 11 of the United States Code, or similar official or any liquidating agent for any of the foregoing, in the liquidating agent's capacity as such. "Company" shall not include:

(1) A company required to be registered under the Investment Company Act of 1940 but which is not so registered;

(2) A private investment company is an entity which would be defined as an investment company under Section 3(a) of the Investment Company Act of 1940 but for the exception from that definition provided by Section 3(c)(1) of that Act;

(3) An investment company registered under the Investment Company Act of 1940; or

(4) A business development company as defined in Section 202(a)(22) of the Investment Advisers Act of 1940, unless each of the equity owners of any such company, other than the investment adviser entering into the contract, is a natural person or a company within the meaning of "company."

e. "Interested person" means:

(1) Any member of the immediate family of any natural person who is an affiliated person of the investment adviser;

(2) Any person who knowingly has any direct or indirect beneficial interest in, or who is designated as trustee, executor, or guardian of any legal interest in, any security issued by the investment adviser or by a controlling person of the investment adviser if that beneficial or legal interest exceeds:

1. One-tenth of one percent of any class of outstanding securities of the investment adviser or a controlling person of the investment adviser; or

2. Five percent of the total assets of the person seeking to act as the client's independent agent; or

(3) Any person or partner or employee of any person who has acted as legal counsel for the investment adviser within the past two years.

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.47(502) Business continuity and succession planning for investment advisers.

50.47(1) On and after July 1, 2017, every investment adviser registered in Iowa shall make and maintain records, pursuant to Iowa Code section 502.411(3) "a," of the establishment, implementation and maintenance of a written business continuity and succession plan. The business continuity and succession plan shall be created and implemented in a manner consistent with the NASAA Guidance on Business Continuity and Succession Planning for State-Registered Investment Advisers, which is available on the Iowa insurance division's website, iid.iowa.gov. In developing the procedures for the business continuity and succession plan, the investment adviser shall consider, among other things, the size of the firm, the types of services provided and the number of locations of the investment adviser. The business continuity and succession plan shall provide for, at a minimum, all of the following:

a. The protection, backup, and recovery of books and records;

b. Alternate means of communications with customers, key personnel, employees, vendors, service providers (including third-party custodians of securities) and regulators, that will allow the communication of certain events, including, but not limited to, providing notice of a significant business interruption or the death or unavailability of key personnel or other disruptions or cessation of business activities;

c. Office relocation in the event of temporary or permanent loss of a principal place of business;

d. Assignment of duties to qualified responsible persons in the event of the death or unavailability of key personnel; and

e. Other means of minimizing service disruptions and client harm that could result from a sudden significant business interruption.

50.47(2) Every investment adviser registered in Iowa shall annually review the investment adviser's written business continuity and succession plan and, if it has been changed since it was submitted, or if it was not previously submitted, shall file it for examination by the administrator, pursuant to Iowa Code section 502.411(4). The administrator shall review an investment adviser's written business continuity and succession plan to determine whether it is consistent with the NASAA Guidance on Business Continuity and Succession Planning for State-Registered Investment Advisers and whether it takes into account the considerations listed in subrule 50.47(1). The administrator may request the investment adviser to modify the filed business continuity and succession plan according to the administrator's suggestions. After the initial filing, the investment adviser's filing of any change shall identify any substantive amendment to the business continuity and succession plan with the registration renewal following the amendment. The administrator may request from the investment adviser at any time information regarding the business continuity and succession plan made since the last filing of the plan.

50.47(3) An investment adviser registered in Iowa shall be deemed in compliance with this rule if the investment adviser can demonstrate compliance with SEC rules or other law related to the investment adviser's adoption and implementation of a written business continuity and succession plan.

This rule is intended to implement Iowa Code chapter 502.
[ARC 2872C, IAB 12/21/16, effective 1/25/17; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.48 and 50.49 Reserved.

DIVISION IV
RULES COVERING ALL REGISTERED PERSONS

191—50.50(502) Internet advertising by broker-dealers, investment advisers, broker-dealer agents, investment adviser representatives, and federal covered investment advisers.

50.50(1) Broker-dealers, investment advisers, broker-dealer agents, investment adviser representatives, and federal covered investment advisers who use the Internet, the World Wide Web, or similar proprietary or common carrier electronic systems (collectively described as the "Internet") to disseminate information regarding products and services through communications directed generally to anyone having access to the Internet and transmitted through posting on bulletin boards, displays on home pages or similar methods (hereinafter "Internet communications") will not be considered to be transacting business in Iowa pursuant to Iowa Code section 502.401, 502.402, 502.403, 502.404, or 502.405 based solely on that communication, if:

a. The Internet communication contains a legend clearly stating that:

(1) The broker-dealer, investment adviser, broker-dealer agent, investment adviser representative, or federal covered investment adviser may only transact business in a state if first registered pursuant to or excluded or exempt from the state broker-dealer, investment adviser, broker-dealer agent, or investment adviser representative registration requirements, or federal covered investment adviser notice requirement; and

(2) The broker-dealer, investment adviser, broker-dealer agent, investment adviser representative, or federal covered investment adviser will not effect or attempt to effect transactions in securities or render personalized investment advice for compensation absent compliance with applicable state broker-dealer, investment adviser, broker-dealer agent, or investment adviser representative registration requirements, or federal covered investment adviser notice requirement or applicable exemption or exclusion;

b. The Internet communication contains a mechanism, including but not limited to technical firewalls or other policies and procedures, to ensure that, prior to effecting or attempting to effect transactions with customers in Iowa or prior to direct communication with prospective customers or clients in Iowa, the broker-dealer, investment adviser, broker-dealer agent, or investment adviser representative is first registered in Iowa or, in the case of a federal covered investment adviser, has made a notice filing, or qualifies for an exemption or exclusion from registration requirements;

c. The Internet communication is limited to general information regarding products and services, and the broker-dealer, investment adviser, broker-dealer agent, investment adviser representative, or federal covered investment adviser does not effect or attempt to effect transactions in securities in Iowa or provide personalized investment advice for compensation; and

d. In the case of a broker-dealer agent or investment adviser representative:

(1) The agent's broker-dealer, investment adviser, or federal covered investment adviser affiliation is prominently disclosed within the Internet communication;

(2) The broker-dealer, investment adviser, or federal covered investment adviser with whom the agent or representative is affiliated reviews and approves the content of any Internet communication by the broker-dealer agent or investment adviser representative;

(3) The broker-dealer, investment adviser, or federal covered investment adviser with whom the agent or representative is associated first authorizes the dissemination of information on the particular products and services through the Internet communication; and

(4) The broker-dealer agent or investment adviser representative acts within the scope of the authority granted by the broker-dealer, investment adviser, or federal covered investment adviser in the dissemination of information through the Internet communication.

50.50(2) Nothing in this rule shall excuse broker-dealer, investment adviser, broker-dealer agent, investment adviser representative, and federal covered investment adviser compliance with applicable securities registration, notice filing, antifraud or related provisions.

50.50(3) Nothing in this rule shall be construed to affect the activities of any broker-dealer, investment adviser, broker-dealer agent, investment adviser representative, or federal covered investment adviser engaged in business in Iowa that is not subject to the jurisdiction of the administrator as a result of NSMIA.

This rule is intended to implement Iowa Code sections 502.401 to 502.405.

191—50.51(502) Consent to service.

50.51(1) Every consent appointing the administrator or successor to be an attorney to receive service of any lawful process as required by Iowa Code section 502.611 shall be properly notarized and shall contain, at a minimum, the following information:

a. Name of the applicant;

b. Address of the applicant;

c. A statement that the consent is irrevocable;

d. A statement that the consent is valid as to any noncriminal suit, action or proceeding against the applicant or the successor, executor or administrator of the applicant which arises out of the Act; and

e. A statement that the applicant stipulates and agrees that service upon the administrator shall have the same validity as if served personally upon the applicant.

50.51(2) A form of consent to service of process provided by the administrator, a Form U-2, or a consent to service of process contained in any other form authorized or required to be filed by these rules shall satisfy subrule 50.51(1).

50.51(3) A broker-dealer, investment adviser, agent, investment adviser representative, federal covered investment adviser, or issuer may incorporate by reference any consent to service of process required to be filed pursuant to Iowa Code sections 502.302(1) "a," 502.302(3), 502.303(2), 502.304(2), 502.406(1) and 502.611, or the administrative rules implementing these sections.

This rule is intended to implement Iowa Code section 502.611.

191—50.52(252J) Denial, suspension or revocation of agent or investment adviser representative registration for failure to pay child support.

50.52(1) Upon receipt of a certificate of noncompliance from the CSRU for default on debts owed to or collected by the CSRU, the administrator shall issue a notice to a securities agent or investment adviser representative applicant or registrant that any pending application for registration will be denied or any current registration will be suspended or revoked 30 days after the date of the notice. The notice shall be served by restricted certified mail, return receipt requested, or by personal service as provided

by the Iowa Rules of Civil Procedure, unless the applicant or registrant accepts service personally or through authorized counsel.

50.52(2) The administrator shall provide the applicant or registrant with a copy of the certificate of noncompliance and shall provide a notice advising the applicant that:

a. The administrator intends to deny an application or to suspend or revoke a registration due to receipt of a certificate of noncompliance from the CSRU;

b. The applicant or registrant must contact the CSRU to schedule a conference or to otherwise obtain a withdrawal of a certificate of noncompliance;

c. Unless the CSRU furnishes a withdrawal of a certificate of noncompliance to the administrator within 30 days of issuance of the notice, the application shall be denied or the registration shall be suspended or revoked;

d. The applicant or registrant does not have a right to a hearing before the administrator, but may, pursuant to Iowa Code section 252J.9, request a court hearing within 30 days of provision of notice by the administrator; and

e. The filing of an application for hearing with the district court will stay the proceedings of the administrator.

50.52(3) The filing of an application for hearing with the district court under Iowa Code section 252J.9 automatically stays action of the administrator until the administrator is notified of the resolution of the application.

50.52(4) If the administrator does not receive a withdrawal of the certificate of noncompliance from the CSRU or a notice that an application for district court hearing has been filed, the administrator shall deny, suspend or revoke the application or registration 30 days after the notice prescribed in subrule 50.52(2) is issued.

50.52(5) Upon receiving a withdrawal of the certificate of noncompliance from the CSRU, the administrator shall immediately halt action to deny an application or suspend or revoke a registration. The applicant or registrant shall be notified that action has been halted. If the application has already been denied or if a registration has already been suspended or revoked, the applicant or former registrant shall reapply for registration. The application shall be granted if the individual is otherwise in compliance with applicable laws, rules, regulations and orders.

50.52(6) All application fees must be paid by the applicant before a registration will be issued after the administrator has denied, suspended, or revoked a registration pursuant to Iowa Code chapter 252J.

50.52(7) Notwithstanding any statutory confidentiality provision, the administrator may share information with the CSRU for the sole purpose of identifying applicants or registrants subject to enforcement pursuant to Iowa Code chapter 252J.

This rule is intended to implement Iowa Code chapter 252J.
[ARC 2872C, IAB 12/21/16, effective 1/25/17]

191—50.53(261) Denial, suspension or revocation of agent or investment adviser representative registration for failure to pay debts owed to or collected by the college student aid commission.

50.53(1) Upon receipt of a certificate of noncompliance from the college student aid commission for defaults on debts owed to or collected by the commission, the administrator shall issue a notice to a securities agent or investment adviser representative applicant or registrant that any pending application for registration or any current registration will be denied, suspended or revoked 30 days after the date of the notice. The notice shall be served by restricted certified mail, return receipt requested, or by personal service as provided by the Iowa Rules of Civil Procedure, unless the applicant or registrant accepts service personally or through authorized counsel.

50.53(2) The administrator shall provide the applicant or registrant with a copy of the certificate of noncompliance and shall provide a notice advising the applicant or registrant that:

a. The administrator intends to deny an application or suspend or revoke a registration due to receipt of a certificate of noncompliance from the college student aid commission;

b. The applicant or registrant must contact the college student aid commission to schedule a conference or to otherwise obtain a withdrawal of a certificate of noncompliance;

c. Unless the college student aid commission furnishes a withdrawal of a certificate of noncompliance to the administrator within 30 days of issuance of the notice, the application shall be denied or the registration shall be suspended or revoked;

d. The applicant or registrant does not have a right to a hearing before the administrator but may, pursuant to Iowa Code section 261.126, request a district court hearing within 30 days of provision of notice by the administrator; and

e. The filing of an application for hearing with the district court will stay the proceedings of the administrator.

50.53(3) The filing of an application for hearing with the district court under Iowa Code section 261.127 automatically stays action of the administrator until the administrator is notified of the resolution of the application.

50.53(4) If the administrator does not receive a withdrawal of the certificate of noncompliance from the college student aid commission or a notice that an application for district court hearing has been filed, the administrator shall deny the application or suspend or revoke the registration 30 days after the notice prescribed in subrule 50.53(2) is issued.

50.53(5) If the administrator receives a withdrawal of the certificate of noncompliance from the college student aid commission, the administrator shall immediately halt action to deny, suspend or revoke an application or registration. The applicant or registrant shall be notified that action has been halted. If the application or registration has already been denied, suspended or revoked, the applicant or former registrant shall reapply for registration. The application shall be granted if the individual is otherwise in compliance with applicable laws, rules, regulations and orders.

50.53(6) All application fees must be paid by the applicant before a registration will be issued after the administrator has denied, suspended, or revoked a registration pursuant to Iowa Code section 261.126.

50.53(7) Notwithstanding any statutory confidentiality provision, the administrator may share information with the college student aid commission for the sole purpose of identifying applicants or registrants subject to enforcement pursuant to Iowa Code section 261.126.

This rule is intended to implement Iowa Code section 261.126.

[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 2872C, IAB 12/21/16, effective 1/25/17]

191—50.54(272D) Denial, suspension or revocation of agent or investment adviser representative registration for failure to pay state debt.

50.54(1) Upon receipt of a certificate of noncompliance from the centralized collection unit of the department of revenue (CCU), the administrator shall issue a notice to a securities agent or investment adviser representative applicant or registrant that any pending application for registration will be denied or any current registration will be suspended or revoked 60 days after the date of the notice. The notice shall be served by restricted certified mail, return receipt requested, or by personal service as provided by the Iowa Rules of Civil Procedure, unless the applicant or registrant accepts service personally or through authorized counsel.

50.54(2) The administrator shall provide the applicant or registrant with a copy of the certificate of noncompliance and shall provide a notice advising the applicant that:

a. The administrator intends to deny an application or to suspend or revoke a registration due to receipt of a certificate of noncompliance from the CCU;

b. The applicant or registrant must contact the CCU to schedule a conference or to otherwise obtain a withdrawal of a certificate of noncompliance;

c. Unless the CCU furnishes a withdrawal of a certificate of noncompliance to the administrator within 60 days of issuance of the notice, the application shall be denied or the registration shall be suspended or revoked;

d. The applicant or registrant does not have a right to a hearing before the administrator, but may file an application for hearing in district court pursuant to Iowa Code section 272D.9; and

e. The filing of an application for hearing with the district court will stay the proceedings of the administrator.

50.54(3) The filing of an application for hearing with the district court under Iowa Code section 272D.9 automatically stays action of the administrator until the administrator is notified of the resolution of the application.

50.54(4) If the administrator does not receive a withdrawal of the certificate of noncompliance from the CCU or a notice that an application for district court hearing has been filed, the administrator shall deny, suspend or revoke the application or registration 60 days after the notice prescribed in subrule 50.54(2) is issued.

50.54(5) Upon receiving a withdrawal of the certificate of noncompliance from the CCU, the administrator shall immediately halt action to deny an application or suspend or revoke a registration. The applicant or registrant shall be notified that action has been halted. If the application has already been denied or if a registration has already been suspended or revoked, the applicant or former registrant shall reapply for registration. The application shall be granted if the individual is otherwise in compliance with applicable laws, rules, regulations and orders.

50.54(6) All application fees must be paid by the applicant before a registration will be issued after the administrator has denied, suspended, or revoked a registration pursuant to Iowa Code chapter 272D.

50.54(7) Notwithstanding any statutory confidentiality provision, the administrator may share information with the CCU for the sole purpose of identifying applicants or registrants subject to enforcement pursuant to Iowa Code chapter 272D.

This rule is intended to implement Iowa Code chapter 272D.

[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 2872C, IAB 12/21/16, effective 1/25/17]

191—50.55(502) Use of senior-specific certifications and professional designations.

50.55(1) The use of a senior-specific certification or designation by any person in connection with the offer, sale, or purchase of securities or the provision of advice as to the value of or the advisability of investing in, purchasing, or selling securities, either directly or indirectly or through publications or writings, or by issuing or promulgating analyses or reports relating to securities, that indicate or imply that the user has special certification or training in advising or servicing senior citizens or retirees in such a way as to mislead any person shall be a dishonest and unethical practice in the securities, commodities, investment, franchise, banking, finance, or insurance business within the meaning of Iowa Code section 502.412(4) “m.” The prohibited use of such certifications or professional designation includes, but is not limited to, the following:

- a. Use of a certification or professional designation by a person who has not actually earned or is otherwise ineligible to use such certification or designation;
- b. Use of a nonexistent or self-conferred certification or professional designation;
- c. Use of a certification or professional designation that indicates or implies a level of occupational qualifications obtained through education, training, or experience that the person using the certification or professional designation does not have; and
- d. Use of a certification or professional designation that was obtained from a designating or certifying organization that:
 - (1) Is primarily engaged in the business of instruction in sales or marketing;
 - (2) Does not have reasonable standards or procedures for ensuring the competency of its designees or certificants;
 - (3) Does not have reasonable standards or procedures for monitoring and disciplining its designees or certificants for improper or unethical conduct; or
 - (4) Does not have reasonable continuing education requirements for its designees or certificants in order to maintain the designation or certificate.

50.55(2) There is a rebuttable presumption that a designating or certifying organization is not disqualified solely for purposes of 50.55(1) “d” when the organization has been accredited by:

- a. The American National Standards Institute;
- b. The National Commission for Certifying Agencies; or

c. An organization that is on the United States Department of Education’s list entitled “Accrediting Agencies Recognized for Title IV Purposes” and the designation or credential issued therefrom does not primarily apply to sales or marketing.

50.55(3) In determining whether a combination of words or an acronym standing for a combination of words constitutes a certification or professional designation indicating or implying that a person has special certification or training in advising or servicing senior citizens or retirees, the administrator shall consider the following factors:

a. Use of one or more words such as “senior,” “retirement,” “elder,” or similar words combined with one or more words such as “certified,” “registered,” “chartered,” “adviser,” “specialist,” “consultant,” “planner,” or similar words in the name of the certification or professional designation; and

b. The manner in which those words are combined.

50.55(4) For purposes of this rule, a certification or professional designation does not include a job title within an organization that is licensed or registered by a state or federal financial services regulatory agency, when that job title:

a. Indicates seniority or standing within the organization; or

b. Specifies an individual’s area of specialization within the organization.

For purposes of this subrule, financial services regulatory agency includes, but is not limited to, an agency that regulates broker-dealers, investment advisers, or investment companies as defined under the Investment Company Act of 1940.

50.55(5) Nothing in this rule shall limit the administrator’s authority to enforce existing provisions of law.

This rule is intended to implement Iowa Code section 502.605(1).
[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.56 to 50.59 Reserved.

DIVISION V
REGISTRATION OF SECURITIES

191—50.60(502) Notice filings for investment company securities offerings.

50.60(1) Except as provided in subrule 50.60(5), no investment company that is registered under the Investment Company Act of 1940 or that has a currently filed registration statement under the Securities Act of 1933 is required to file with the administrator, either prior to the initial offer or after the initial offer in Iowa of a security which is a covered security under Section 18(b)(2) of the Securities Act of 1933, a copy of any document which is part of a federal registration statement filed with the SEC or is part of an amendment to such federal registration statement.

50.60(2) Prior to the initial offer of a federal covered security in Iowa, an investment company that is registered under the Investment Company Act of 1940 or that has filed a registration statement under the Securities Act of 1933 shall file with the administrator:

a. A notice of filing on Form NF;

b. A filing fee; and

c. A consent to service of process.

50.60(3) A notice of filing may be renewed prior to expiration by filing the following with the administrator:

a. A notice of filing on Form NF; and

b. Payment of the applicable fee under Iowa Code section 502.302(1) “*a.*”

50.60(4) Amendments to notice filings are made on Form NF and are effective upon receipt by the administrator. Withdrawal or termination of a notice filing is made by filing Form NF or providing the administrator with notice of the withdrawal or termination in a similar format. An amendment, withdrawal, or termination is effective upon receipt by the administrator of the required notice and all fees required by Iowa Code section 502.302(1) “*a.*”

This subrule is intended to implement Iowa Code section 502.302.

50.60(5) An investment company that is registered under the Investment Company Act of 1940 or that has filed a registration statement under the Securities Act of 1933 shall file, upon written request of the administrator and within the time period set forth in the request, a copy of any document identified in the request that is part of the federal registration statement filed with the SEC or part of an amendment to such federal registration statement.

50.60(6) An investment company that makes a notice filing under subrule 50.60(2) and that pays an initial \$400 filing fee under Iowa Code section 502.302(1)“a” shall pay a \$400 renewal fee prior to the notice filing’s annual renewal date. Notice filings that are not renewed by the annual renewal date shall expire.

This subrule is intended to implement Iowa Code section 502.302.

50.60(7) Effective January 1, 2019, when notice filings of the records and fees are required by this rule for the offer or sale of unit investment trusts (as defined in the Investment Company Act of 1940 (15 U.S.C. Section 80a-4(2)), the filings shall be submitted electronically through NASAA’s electronic filing depository system at efdnasaa.org.

This rule is intended to implement Iowa Code section 502.302(1).

[ARC 2175C, IAB 9/30/15, effective 11/4/15; ARC 2731C, IAB 9/28/16, effective 11/2/16; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.61(502) Registration of small corporate offerings.

50.61(1) Form U-7 may be obtained from the NASAA website at www.nasaa.org. Form U-7 has been developed under the Small Business Investment Incentive Act of 1980 which prescribes state and federal cooperation in furthering the policies of the Act: diminishing the burden of raising investment capital and minimizing interference with the business of capital formation.

50.61(2) To be eligible to use Form U-7, the issuer shall comply with each of the following requirements:

a. The issuer shall:

(1) Be a corporation or limited liability company organized under the laws of the United States or Canada, or any state, province, or territory or possession thereof, or the District of Columbia and have its principal place of business in one of the foregoing;

(2) Not be subject to the reporting requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934;

(3) Not be an investment company registered or required to be registered under the Investment Company Act of 1940;

(4) Not be engaged in or propose to be engaged in petroleum exploration and production, mining, or other extractive industries;

(5) Not be a development stage company that either has no specific business plan or purpose or has indicated that its business plan is to engage in a merger or acquisition with an unidentified company or companies or other entity or person; and

(6) Not be disqualified under subrule 50.61(3).

b. The offering price for common stock or common ownership interests (hereinafter, collectively referred to as “common stock”), the exercise price for options, warrants, or rights to common stock, or the conversion price for securities convertible into common stock must be greater than or equal to U.S. \$1 per share or unit of interest. The issuer must agree with the administrator that the issuer will not split its common stock, or declare a stock dividend for two years after the effective date of the registration if such action has the effect of lowering the price below U.S. \$1.

c. Commissions, fees or other remuneration for soliciting any prospective purchaser in connection with the offering in the state are only paid to persons who, if required to be registered or licensed, the issuer believes, and has reason to believe, are appropriately registered or licensed in the state.

d. Financial statements shall be prepared in accordance with either U.S. or Canadian generally accepted accounting principles. If appropriate, a reconciliation note should be provided. If the company has not conducted significant operations, statements of receipts and disbursements shall be included in lieu of statements of income. Interim financial statements may be unaudited. All other financial

statements shall be audited by independent certified public accountants, provided, however, that if each of the following four conditions are met, such financial statements in lieu of being audited may be reviewed by independent certified public accountants in accordance with the Accounting and Review Service Standards promulgated by the American Institute of Certified Public Accountants or the Canadian equivalent:

(1) The company shall not have previously sold securities through an offering involving the general solicitation of prospective investors by means of advertising, mass mailings, public meetings, "cold call" telephone solicitation, or any other method directed toward the public;

(2) The company has not been previously required under federal, state, provincial or territorial securities laws to provide audited financial statements in connection with any sale of its securities;

(3) The aggregate amount of all previous sales of securities by the company (exclusive of debt financing with banks and similar commercial lenders) shall not exceed U.S. \$1 million; and

(4) If the offering is a Rule 504 offering, the amount of the present offering does not exceed U.S. \$1 million.

e. The offering shall be made in compliance with Rule 504 of Regulation D, Regulation A, or Section 3(a)(11) of the Securities Act of 1933.

f. The issuer shall comply with the General Instructions to SCOR in Part I of the NASAA SCOR Issuer's Manual.

50.61(3) Disqualifications.

a. Unless the administrator determines that it is not necessary under the circumstances that the disqualification under this subrule be applied, application for registration referred to in subrule 50.61(2) shall be denied if the issuer, any of its officers, directors, stockholders who own 10 percent or greater of the issuer, promoters, or selling agents, or any officer, director or partner of any selling agent:

(1) Has filed a registration statement which is subject to a currently effective stop order entered pursuant to any state or provincial securities laws within five years prior to the filing of the registration statement;

(2) Has been convicted, within five years prior to the filing of the registration statement, of any felony or misdemeanor in connection with the offer, purchase, or sale of securities, or of any felony involving fraud or deceit including, but not limited to, forgery, embezzlement, obtaining money under false pretenses, larceny, or conspiracy to defraud;

(3) Is currently subject to any state or provincial administrative enforcement order or judgment entered by that state's or province's securities administrator within five years prior to the filing of the registration statement;

(4) Is subject to any state or provincial administrative enforcement order or judgment in which fraud or deceit including, but not limited to, making untrue statements of material facts and omitting to state material facts, was found, and the order or judgment was entered within five years prior to the filing of the current application for registration;

(5) Is subject to any state or provincial administrative enforcement order or judgment which prohibits, denies, or revokes the use of any exemption from registration in connection with the offer, purchase or sale of securities;

(6) Is currently subject to any order, judgment, or decree of any court of competent jurisdiction that temporarily, preliminarily, or permanently restrains or enjoins such party from engaging in or continuing any conduct or practice in connection with the purchase or sale of any security, or involving the making of any false filing with the state, entered within five years prior to the filing of the registration statement; or

(7) Has violated the law of a foreign jurisdiction governing or regulating any aspect of the business of securities or banking or, within the past five years, has been the subject of an action of a securities regulator of a foreign jurisdiction denying, revoking or suspending the right to engage in the business of securities as a broker-dealer, agent or investment adviser or is the subject of an action of any securities exchange or self-regulatory organization operating under the authority of the securities regulator of a foreign jurisdiction suspending or expelling such person from membership in such exchange or self-regulatory organization.

b. The prohibitions of subparagraphs (1) to (3) and (5) of paragraph 50.61(3)“*a*” shall not apply if the person subject to the disqualification is duly registered or licensed to conduct securities-related business in the state or province in which the administrative order or judgment was entered against such person, or if the broker-dealer employing such person is registered or licensed in the state and the Form BD filed in the state discloses the order, conviction, judgment or decree relating to such person.

c. No person disqualified shall act in any capacity other than the capacity for which the person is registered or licensed.

d. Disqualification is automatically waived if the jurisdiction which created the basis for disqualification determines upon a showing of good cause that it is not necessary under the circumstances that registration be denied.

This rule is intended to implement Iowa Code section 502.304.

[ARC 2175C, IAB 9/30/15, effective 11/4/15]

191—50.62(502) Streamlined registration for certain equity securities.

50.62(1) An equity security meeting the conditions of this rule may be registered pursuant to Iowa Code section 502.303 if all of the following conditions are satisfied, unless waived by the administrator, and except as provided by subrule 50.62(2):

a. The issuer must be a corporation organized under the laws of one of the states or possessions of the United States;

b. The offering price for common stock, the exercise price if the securities are options, warrants, or rights for common stock, or the conversion price if the securities are convertible into common stock must be equal to or greater than \$5 per share;

c. The issuer of the security has (or will have upon completion of the offering) total assets exceeding \$10 million;

d. The security will be offered under a firm underwriting;

e. The security is the subject of a registration statement filed on Form S-1 or Form SB-2 with the SEC; and

f. The registration statement filed with the administrator contains audited financial statements for each of the two most recently concluded fiscal years of its operations, and the audit for the most recent fiscal year does not include an auditor’s report expressing substantial doubt about the issuer’s ability to continue as a going concern.

50.62(2) Registration pursuant to this rule is not available if:

a. The issuer is a blind pool or other offering for which the specific business or properties cannot now be described; or

b. The issuer, a principal officer or a principal shareholder thereof, or a broker-dealer offering or selling the securities:

(1) Is subject to statutory disqualification, as defined by subparagraphs (A), (B), (C), or (D) of Section 3(a)(39) of the Securities Exchange Act of 1934;

(2) Has been convicted of any felony under federal or state law regarding the offer, purchase, or sale of any security, or any felony under federal or state law involving fraud or deceit in the ten years prior to the date of the offering;

(3) Is currently named in and subject to any order, judgment, or decree of any court of competent jurisdiction acting under federal or state law temporarily or permanently restraining or enjoining the person from engaging in or continuing any conduct or practice in connection with the offer, purchase, or sale of a security;

(4) Has filed a registration statement which is currently the subject of a stop order entered pursuant to any state’s securities law within five years prior to the offering;

(5) Is currently subject to any state administrative enforcement order or judgment entered by that state’s securities administrator within five years prior to the offering, or is currently subject to any state’s administrative enforcement order or judgment in which fraud or deceit was found within five years prior to the offering; or

(6) Is currently subject to any state's administrative order or judgment prohibiting, denying, or revoking the use of any exemption from registration regarding the offer, sale, or purchase of any security, or involving the making of a false filing with the state within five years of the offering.

50.62(3) The unavailability of streamlined registration pursuant to this rule as a result of the disqualification of a party pursuant to paragraph 50.62(2) "b" may be waived by the administrator if the order, conviction, judgment or decree relating to the party's disqualification was disclosed in writing to the administrator and the administrator determines, based upon good cause shown, that the public interest no longer requires the party to be disqualified.

50.62(4) The administrator shall review a filing made pursuant to this rule within ten business days of receipt. Registration shall be effective upon review, or earlier if the administrator permits a shorter time frame, or comments explaining noncompliance will be promptly sent to the applicant.

50.62(5) The administrator shall not deny the effectiveness of a registration made pursuant to this rule based on subrule 50.66(13) or 50.66(15), or based upon the financial condition of the issuer under Iowa Code section 502.306(1) "h."

50.62(6) The following securities shall be the subject of a lockup with the managing underwriter for no less than 180 days, or a longer period if requested by the managing underwriter of the offering:

a. A security issued to a promoter within three years immediately preceding the offering or to be issued to a promoter for consideration substantially less than the offering price; or

b. A security issued to a promoter for a consideration other than cash, unless the registrant demonstrates that the value of the noncash consideration received in exchange for the security is substantially equal to the offering price for the security. A copy of the lockup agreement shall be filed with the administrator.

50.62(7) For purposes of this rule, a "promoter" is:

a. A person who, acting alone or in concert with one or more other persons, founds or organizes the business or enterprise of the issuer;

b. An officer or director owning securities of the issuer, or a person who owns, beneficially or of record, 10 percent or more of a class of securities of the issuer if the officer, director, or person acquires any of those securities in a non-arm's-length transaction within the three years prior to the filing of the registration statement pursuant to this rule; or

c. A member of the immediate family of a person described in paragraph "a" or "b" of subrule 50.62(7) if the family member receives securities of the issuer from that person in a non-arm's-length transaction within the three years prior to the filing of the registration statement pursuant to this rule.

This rule is intended to implement Iowa Code section 502.303.

191—50.63(502) Registration of multijurisdictional offerings.

50.63(1) Pursuant to Iowa Code section 502.303(2), offerings filed on SEC Form F-7, Form F-8, Form F-9 or Form F-10 shall become effective the later of three days after filing, or the effective date with the SEC.

50.63(2) Pursuant to Iowa Code section 502.605(3), financial statements and financial information for offerings filed under subrule 50.63(1) shall comply with instructions provided with SEC Form F-7, Form F-8, Form F-9 or Form F-10.

50.63(3) In a Rights Offering, SEC Form F-7 will be accepted in lieu of any state form required to claim an exemption for any transaction pursuant to an offer to existing securities holders.

50.63(4) After the SEC has declared effective an issuer's Form F-8, Form F-9 or Form F-10 registration statement, a nonissuer transaction in any class of the issuer's securities is exempt from registration, whether or not the transaction is effected through a broker-dealer.

This rule is intended to implement Iowa Code sections 502.303(2) and 502.605(3).

191—50.64(502) Form of financial statements.

50.64(1) Except as otherwise provided by this rule, the balance sheet, statement of cash flows, and statement of income required by Iowa Code section 502.304(2) "q" shall be certified by an independent certified public accountant who shall also issue an opinion on the financial statements. The audit and

opinion requirements may be waived by the administrator upon written application and for good cause shown.

50.64(2) The balance sheet, statement of cash flows, and statement of income provided for compliance with the four-month requirement of Iowa Code section 502.304(2) “q” need not be certified in accordance with subrule 50.64(1) if such certification was submitted for the last fiscal year prior to the application and the date of the financial statements subject to certification is not more than 12 months prior to the registration date.

This rule is intended to implement Iowa Code section 502.304.

191—50.65(502) Reports contingent to registration by qualification. In the administrator’s discretion, a registration by qualification statement filed pursuant to Iowa Code section 502.304 may not become effective until one or both of the following are filed:

1. When the value, after its purchase, of certain property does or will constitute a material portion of the assets of the issuer or any other person whose financial condition is significant to the registration, the report of any appraiser or engineer; and

2. When the ownership of any such property is material to the registration, a signed opinion of legal counsel regarding ownership of any property.

This rule is intended to implement Iowa Code section 502.304(2A).

191—50.66(502) NASAA guidelines and statements of policy.

50.66(1) *Overview of national models.* In cooperation with the securities administrators of other states and with a view to effectuating a policy to achieve maximum uniformity of regulations regarding the registration of securities, registration and business practices of securities industry and investment advisory registrants, and enforcement of antifraud laws, and in the interest of streamlining the rules contained in Chapter 50, the administrator incorporates by reference the following guidelines and statements of policy promulgated by NASAA. This rule does not include any later amendments or editions of the incorporated matter.

The NASAA website allows access to statements of policy, comment letters, model rules, NASAA proposals published for comment, and state rule proposals and may be found at www.nasaa.org, under “regulatory & legal activity.”

50.66(2) *Registration of oil and gas programs.* All oil and gas programs filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Registration of Oil and Gas Programs, which were initially adopted by the NASAA membership on September 22, 1976, as amended on October 12, 1977; October 31, 1979; April 23, 1983; July 1, 1984; September 3, 1987; September 14, 1989; October 24, 1991; May 7, 2007; and May 6, 2012; and published in CCH NASAA Reports at paragraph 2621.

50.66(3) *Uniform disclosure guidelines—legend.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Cover Legends as adopted by the NASAA membership on October 2, 2004, and published in CCH NASAA Reports at paragraph 1351.

50.66(4) *Omnibus guidelines.* All registrations of limited or general partnerships, joint ventures, unincorporated associations, or similar organizations, other than a corporation formed and operated for the primary purpose of investment in and the operation of or gain from and interest in the assets to be acquired by such entity for which statements of policy have not been adopted by the NASAA membership, filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Omnibus Guidelines as adopted by the NASAA membership on March 29, 1992, as amended on May 7, 2007; and published in CCH NASAA Reports at paragraph 2321.

50.66(5) *Registration of commodity pool programs.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Registration of Commodity Pool Programs as adopted by the NASAA membership on September 21, 1983, effective January 1, 1984, amended August

30, 1990, amended May 7, 2007, amended May 6, 2012, and published in CCH NASAA Reports at paragraph 1201.

50.66(6) *Registration of equipment programs.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Equipment Programs as adopted by the NASAA membership on November 20, 1986, effective January 1, 1987, amended April 22, 1988, October 24, 1991, May 7, 2007, and May 6, 2012, and published in CCH NASAA Reports at paragraph 1601.

50.66(7) *Registration of real estate programs.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Real Estate Programs as adopted by the NASAA membership on September 29, 1993, last revised, May 7, 2007, and published in CCH NASAA Reports at paragraph 3601.

50.66(8) *Registration of mortgage programs.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Mortgage Programs as adopted by the NASAA membership on September 10, 1996, amended May 2007, and published in CCH NASAA Reports, paragraph 701.

50.66(9) *Real estate investment trusts.* The registration of a real estate investment trust may be disallowed if it does not substantially comply, as determined by the administrator, with the NASAA Statement of Policy Regarding Real Estate Investment Trusts as revised and adopted by the NASAA membership on September 29, 1993, as revised on May 7, 2007, and published in CCH NASAA Reports at paragraph 3401.

50.66(10) *Corporate securities definitions.* For securities registration purposes, the administrator adopts the various definitions set out in the NASAA Statement of Policy Regarding Corporate Securities Definitions as adopted by the NASAA membership on April 27, 1997, and as amended September 28, 1999, and March 31, 2008, and published in CCH NASAA Reports at paragraph 3812.

50.66(11) *Impoundment of proceeds.* When an impoundment of proceeds is necessary, it shall substantially comply, as determined by the administrator, with the NASAA Statement of Policy Regarding the Impoundment of Proceeds as adopted by the NASAA membership on April 27, 1997, and as amended September 28, 1999, and March 31, 2008, and published in CCH NASAA Reports at paragraph 2151.

50.66(12) *Loans and other material affiliated transactions.* When there have been or will be loans or other material affiliated transactions, the transactions shall substantially comply, as determined by the administrator, with the NASAA Statement of Policy Regarding Loans and Other Material Affiliated Transactions as amended by the NASAA membership on April 27, 1997, and March 31, 2008, and published in CCH NASAA Reports at paragraph 374.

50.66(13) *Options and warrants.* The issuance of options and warrants may be allowed by the administrator if the issuance is in substantial compliance, as determined by the administrator, with the NASAA Statement of Policy Regarding Options and Warrants as adopted by the NASAA membership on November 17, 1997, and as amended September 28, 1999, and as amended March 31, 2008, and published in CCH NASAA Reports at paragraph 2801.

50.66(14) *Preferred stock.* A public offering of preferred stock may be allowed by the administrator if the administrator determines that the offering substantially complies with the NASAA Statement of Policy Regarding Preferred Stock as adopted by the NASAA membership on April 27, 1997, and as amended March 31, 2008, and September 11, 2016 (nasaa.cdn.s3.amazonaws.com/wp-content/uploads/2011/07/SOP-Regarding-Preferred-Stock-Amended0916.pdf).

50.66(15) *Promotional shares.* The registration of a security may include promotional shares if it substantially complies, as determined by the administrator, with the NASAA Statement of Policy Regarding Promotional Shares as adopted by the NASAA membership on April 27, 1997, and as amended September 28, 1999, and March 31, 2008, and published in CCH NASAA Reports at paragraph 3201.

50.66(16) *Risk disclosure.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines

for Risk Disclosure as adopted by the NASAA membership on September 8, 2001, and published in CCH NASAA Reports at paragraph 1362.

50.66(17) *Unsound financial condition.* An issuer may be deemed to be in an unsound financial condition if it substantially meets, as determined by the administrator, the conditions provided within the NASAA Statement of Policy Regarding Unsound Financial Condition as adopted by the NASAA membership on April 27, 1997, and as amended September 28, 1999, and March 31, 2008, and published in CCH NASAA Reports at paragraph 3821.

50.66(18) *Use of proceeds.* The registration of a security may be disallowed if the administrator determines that the registration does not substantially comply with the NASAA Statement of Policy Regarding Specificity in Use of Proceeds as amended by the NASAA membership on April 27, 1997, September 28, 1999, March 31, 2008, and September 11, 2016 (nasaa.cdn.s3.amazonaws.com/wp-content/uploads/2011/07/SPECIFICITY_IN_USE_OF_PROCEEDS-Amended0916.pdf).

50.66(19) *Registration of asset-backed securities.* All registrations of securities filing for registration by coordination or qualification shall substantially comply, as determined by the administrator, with the NASAA Guidelines for Registration of Asset-Backed Securities as adopted by the NASAA membership on October 25, 1995, amended May 7, 2007, and May 6, 2012, and published in CCH NASAA Reports at paragraph 501.

50.66(20) *Promoters' equity investment.* The registration of a security may be disallowed by the administrator if the administrator determines that the registration does not substantially comply with the NASAA Statement of Policy Regarding Promoters' Equity Investment as amended by the NASAA membership on April 27, 1997, March 31, 2008, and September 11, 2016 (nasaa.cdn.s3.amazonaws.com/wp-content/uploads/2011/07/PROMOTERS_EQUITY_INVESTMENT-revised0916.pdf).

50.66(21) *Unequal voting rights.* The registration of a security may be disallowed by the administrator if the administrator determines that the registration does not substantially comply with the NASAA Statement of Policy Regarding Unequal Voting Rights as adopted by the NASAA membership on October 24, 1991, and as amended March 31, 2008, and September 11, 2016 (nasaa.cdn.s3.amazonaws.com/wp-content/uploads/2011/07/SOP_Unequal_Voting_Rights-Amended0916.pdf).

50.66(22) *Use of electronic offering documents and electronic signatures.*

a. Definitions. For purposes of this subrule, the following definitions apply.

"Offering documents" means documents that include, but are not limited to, the registration statement, prospectus, applicable agreements, charter, bylaws, opinion of counsel and other opinions, specimen, indenture, consent to service of process and associated resolution, sales materials, subscription agreement, and applicable exhibits.

"Sales materials" means materials that include only those materials to be used in connection with the solicitation of purchasers of the securities approved as sales literature or other related materials by the SEC, FINRA, and the states, as applicable.

"Security breach" means the unauthorized accessing, acquisition, or disclosure of any data that compromises the security or confidentiality of confidential personal information maintained by the person or business; provided, however, that for this purpose a "security breach" shall relate only to a system, technology, or process that is used in connection with or is introduced into a securities offering in order to implement the use of electronic offering documents or electronic signatures.

b. Use of electronic offering documents and subscription agreements.

(1) An issuer of securities or agent acting on behalf of the issuer may deliver offering documents over the Internet or by other electronic means, or in machine-readable format, provided all of the following requirements are met:

1. Each offering document:

- Is prepared, updated, and delivered in a manner consistent and in compliance with state and federal securities laws;
- Satisfies the formatting requirements applicable to printed documents, such as font size and typeface, and is identical in content to the printed version (other than electronic instructions or procedures as may be displayed and nonsubstantive updates to daily net asset value which can be updated more efficiently in the electronic version);

- Is delivered as a single, integrated document or file; when delivering multiple offering documents, the documents must be delivered together as a single package or list;
 - Where the offering documents include a hyperlink to external documents or content, provides notice to investors or prospective investors that the document or content being accessed by the hyperlink is provided by an external source; and
 - Is delivered in an electronic format that intrinsically enables the recipient to store, retrieve, and print the documents;
2. The issuer or agent acting on behalf of the issuer:
 - Obtains informed consent from the investor or prospective investor to receive offering documents electronically;
 - Ensures that the investor or prospective investor receives timely, adequate, and direct notice when an electronic offering document has been delivered;
 - Employs safeguards to ensure that delivery of offering documents occurred at or before the time required by law in relation to the time of sale; and
 - Maintains evidence of delivery by keeping records of its electronic delivery of offering documents and makes those records available on demand by the securities administrator.

(2) Subscription agreements may be provided electronically by an issuer or agent acting on behalf of the issuer for the prospective investor to review and complete, provided the subscription process is administered in a manner that is similar to the administration of subscription agreements in paper form, as follows:

1. Before completion of any subscription agreement, the issuer or agent acting on behalf of the issuer shall review with the prospective investor all appropriate documentation related to the prospective investment including documents and instructions on how to complete the subscription agreement;
2. Mechanisms shall be established to ensure a prospective investor reviews all required disclosures and scrolls through the document in its entirety prior to initialing or signing; and
3. Unless otherwise allowed by the securities administrator, a single subscription agreement shall be used to subscribe a prospective investor in no more than one offering.

(3) Security breach.

1. In the event of discovery of a security breach at any time in any jurisdiction, the issuer or its agents, as appropriate, shall take prompt action to do all of the following:
 - Identify and locate the breach.
 - Secure the affected information.
 - Suspend the use of the particular device or technology that has been compromised until information security has been restored.
 - Provide notice of the security breach to any investor whose confidential personal information has been improperly accessed in connection with the security breach and to the securities administrator of each state in which an affected investor resides.

2. Compliance with subparagraph 50.66(22)“b”(3) after the discovery of a security breach or any other breach of personal information shall not substitute or in any way affect other requirements or obligations, including notification, imposed on an issuer or its agents pursuant to applicable laws, regulations, or standards.

(4) Delivery requires that the offering documents be conveyed to and received by the investor or prospective investor, or that the storage media in which the offering documents are stored be physically delivered to the investor or prospective investor in accordance with numbered paragraph 50.66(22)“b”(1)“1.”

(5) Each electronic document shall be preceded by or presented concurrently with the following notice: **“Clarity of text in this document may be affected by the size of the screen on which it is displayed.”**

(6) Informed consent to receive offering documents electronically pursuant to the first bulleted paragraph of numbered paragraph 50.66(22)“b”(1)“2” may be obtained in connection with each new offering or globally, either by the issuer or by an agent acting on behalf of the issuer. The investor may revoke this consent at any time by informing the party to whom the consent was given, or, if such party

is no longer available, the issuer. Generally, a consent is considered to be informed when an investor is apprised that the document to be provided will be available through a specific electronic medium or source, and that there may be costs associated with delivery. In addition, for a consent to be informed an investor must be apprised of the time and scope parameters of the consent.

(7) Investment opportunities shall not be conditioned on participation in the electronic offering documents and subscription agreements initiative.

(8) Investors or prospective investors who decline to participate in an electronic offering documents and subscription agreements initiative shall not be subjected to higher costs—other than the actual direct cost of printing, mailing, processing, and storing offering documents and subscription agreements—as a result of their lack of participation in the initiative, and no discount shall be given for participating in an electronic offering documents and subscription agreements initiative.

(9) Entities participating in an electronic initiative shall maintain, and shall require participating underwriters, dealer-managers, placement agents, broker-dealers, or other selling agents to maintain, written policies and procedures covering the use of electronic offering documents and subscription agreements.

(10) Entities and their contractors and agents having custody and possession of electronic offering documents, including electronic subscription agreements, shall store them in a nonrewriteable and nonerasable format.

(11) Subrule 50.66(22) does not change or waive any other requirement of law concerning registration or presale disclosure of securities offerings.

c. Use of electronic signatures.

(1) An issuer of securities or agent acting on behalf of the issuer may provide for the use of electronic signatures if all of the following are true:

1. The process by which electronic signatures are obtained:

- Shall be implemented in compliance with the Electronic Signatures in Global and National Commerce Act and the Uniform Electronic Transactions Act, and, where applicable, shall include required federal disclosures;

- Shall include an appropriate level of security and assurances of accuracy;

- Shall employ an authentication process to establish signer credentials;

- Shall employ security features that protect signed records from alteration; and

- Shall provide that either the issuer or agent acting on behalf of the issuer retain, in compliance with applicable laws and regulations, electronically signed documents;

2. An investor or prospective investor shall expressly opt in to the electronic signature initiative, and participation may be terminated at any time; and

3. Investment opportunities shall not be conditioned on participation in the electronic signature initiative.

(2) Entities that participate in an electronic signature initiative shall maintain, and shall require underwriters, dealer-managers, placement agents, broker-dealers, and other selling agents to maintain, written policies and procedures covering the use of electronic signatures.

(3) Documentation of an investor's election to participate in an electronic signature initiative by following the requirements of numbered paragraph 50.66(22) "b"(1)"2" may be obtained in connection with each new offering, or by an agent acting on behalf of the issuer. The investor may revoke this consent at any time by informing the party to whom the consent was given, or, if such party is no longer available, the issuer.

This rule is intended to implement Iowa Code sections 502.305(6) and 502.306(1).

[ARC 1076C, IAB 10/2/13, effective 11/6/13; ARC 2175C, IAB 9/30/15, effective 11/4/15; ARC 3391C, IAB 10/11/17, effective 11/15/17]

191—50.67(502) Amendments to registration by qualification. A registration statement registered by qualification pursuant to Iowa Code section 502.304 is presumed to be reasonably current for purposes of Iowa Code section 502.305(9) if:

1. The issuer notifies the administrator in writing of any change in a material fact contained in the registration statement no later than 7 days after the issuer learns of the change; and

2. The issuer notifies the administrator in writing of the results of an annual audit or semiannual report no later than 14 days after receiving such audit results or semiannual report unless the results constitute a change in material fact subject to the provisions of paragraph “1.”

This rule is intended to implement Iowa Code section 502.305(9).

191—50.68(502) Delivery of prospectus. As a condition to registration by qualification pursuant to Iowa Code section 502.304, a prospectus containing the information required by Iowa Code section 502.304(2) shall be delivered to each person to which an offer is made, before or concurrently with the earliest of the following events:

1. The first offer made in a record to each person otherwise than by means of a public advertisement, by or for the account of the issuer or any other person on whose behalf the offering is made, or by any underwriter or broker-dealer offering part of an unsold allotment or subscription taken as a participant in the distribution;

2. The confirmation of any sale made by or for the account of the person;

3. The payment pursuant to any such sale; or

4. The delivery of the security pursuant to any such sale.

This rule is intended to implement Iowa Code section 502.304(5).

191—50.69(502) Advertisements.

50.69(1) The following advertising regarding the offer, sale or purchase of any security in Iowa is exempt from the filing requirements of Iowa Code section 502.504:

a. A prospectus published or circulated regarding an offering of a security registered pursuant to Iowa Code section 502.303 or 502.304 that is not yet effective, or an offering of a security for which a notice or application for exemption, including the prospectus, has been filed pursuant to Iowa Code section 502.201 or 502.202;

b. Advertising which provides information regarding only from whom a prospectus may be obtained, a description of the security offered for sale, the price of the security, or the names of broker-dealers having an interest in its sale;

c. Advertising published by a registered broker-dealer or investment adviser concerning the qualifications or business of the registrant, the general advisability of investing in securities or market quotations or other factual information relating to particular securities or issuers, provided the advertising contains no recommendation concerning the purchase or sale of a particular security;

d. Unless specifically requested by the administrator, advertising filed with FINRA or that satisfies the requirements of Securities Act of 1933 Rules 230.135a, 230.156, or 230.482; and

e. Any other advertising the administrator may specify by order.

50.69(2) All advertising required to be filed with the administrator by a registrant shall be filed prior to the date of use. All advertising required to be filed by a person other than a registrant shall be filed at least ten days prior to the date of use, or a shorter period if provided by the administrator. The advertising shall not be used in Iowa until the registrant receives approval from the administrator.

50.69(3) Sales literature of an investment company registered pursuant to the Investment Company Act of 1940 which is materially misleading within the meaning of rules or a statement of policy of the SEC constitutes false or misleading advertising as prohibited by Iowa Code section 502.504(2A).

50.69(4) False or misleading advertisements prohibited by Iowa Code section 502.504(2A) include, but are not limited to, the following:

a. Comparison charts or graphs showing a distorted, unfair, or unrealistic relationship between the issuer’s past performance, progress, or success and that of another company, business, industry, or investment media;

b. Layout or format omitting information necessary to make the entire advertisement a fair and truthful representation;

c. Statements or representations without accreditation predicting future profit, success, appreciation, or performance, or otherwise addressing the merit or potential of the securities;

d. Generalizations, generalized conclusions, opinions, representations, and general statements based upon a particular set of facts and circumstances unless those facts and circumstances are stated and modified or explained by additional facts or circumstances as are necessary to make the entire advertisement a full, fair, and truthful representation;

e. Sales kits or film clips, displays or exposures, which alone or by sequence and progressive compilation present a misleading impression of guaranteed or exaggerated potential, profit, safety, or return;

f. Distribution of any nonfactual or inaccurate data or material by words, pictures, charts, or graphs, or otherwise based upon conjectural, unfounded, extravagant, or flamboyant claims, assertions, or predictions, or upon excessive optimism; and

g. Any package or bonus deal, prize, gimmick, or similar inducement regarding the offer or sale of a security that is combined with or dependent upon the sale of some other product, contract, or service unless the combination has been fully disclosed and specifically described and identified in the advertisement.

50.69(5) Any business card or other advertisement containing the name of an agent shall:

a. Clearly designate the agent as a securities agent or registered representative of the broker-dealer, as applicable, and indicate clearly that the broker-dealer is a broker-dealer;

b. Contain no advertising other than agent name, office address, broker-dealer name, and broker-dealer logo or trademark on the business cards;

c. Provide the office address and telephone number of the location where the agent conducts securities business; and

d. Clearly state the business of that entity and the relationship of the agent to that entity if the name, logo or trademark of any business entity other than that of the broker-dealer appears on the business card or in an advertisement.

50.69(6) A firm employing a sales agent who is offering securities on its behalf is responsible for ensuring that the name of the broker-dealer is displayed on the agent's business cards as prominently as the individual's name.

50.69(7) For the purpose of this rule, "advertisement" means any written or printed communication or any communication by means of recorded telephone messages or transmitted on radio, television, or other electronic communications media, published regarding the offer, sale, or purchase of a security.

This rule is intended to implement Iowa Code section 502.504.

[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.70(502) Fee for securities registration filings under Iowa Code section 502.305. Except as provided in Iowa Code sections 502.302(3) and 502.304A(3) "g," a person who files a registration statement or a notice filing pursuant to Iowa Code section 502.305 as amended by 2016 Iowa Acts, House File 2394, section 2, shall pay the following fees:

50.70(1) For the initial filing, \$400 for one year; and

50.70(2) On each anniversary date of the initial filing, an annual renewal fee of \$400.

This rule is intended to implement Iowa Code section 502.305.

[ARC 2731C, IAB 9/28/16, effective 11/2/16]

191—50.71 to 50.79 Reserved.

DIVISION VI
EXEMPTIONS

191—50.80(502) Uniform limited offering exemption. Rescinded ARC 3741C, IAB 4/11/18, effective 5/16/18.

191—50.81(502) Notice filings for Rule 506 offerings. An issuer offering a security that is a covered security pursuant to Section 18(b)(4)(F) of the Securities Act of 1933 shall submit no later than 15 days after the first sale of such federal covered security in Iowa an electronic filing and fees through www.efdnasaa.org, under “filers and issuers.”

This rule is intended to implement Iowa Code section 502.302(3).
[ARC 2175C, IAB 9/30/15, effective 11/4/15; ARC 2872C, IAB 12/21/16, effective 1/25/17; ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.82(502) Notice filings for agricultural cooperative associations.

50.82(1) An agricultural cooperative association issuing notes or other evidence of indebtedness shall notify the administrator in writing 30 days before the security is initially sold. Notification shall include:

- a. The name of the issuer, the date of organization of the issuer, and the name of a contact person.
- b. A description of the class of persons to whom the offer of securities will be made. If the offering is being made to certain persons or within a specified area, a description of such offerees or area shall be included.
- c. A description of the type of security to be offered which includes information regarding interest and interest payment schedules, default, redemption, reinvestment, and other facts regarding the rights of holders that the issuer deems material to the offering.
- d. Financial statements of the agricultural cooperative association including a balance sheet as of the end of its most recent fiscal year, prepared under generally accepted accounting principles and accompanied by an independent auditor’s report and any other audited financial statements of the association that are available. However, if the filing by the agricultural cooperative association is made within 90 days of the end of its most recent fiscal year and current audited financial statements are not yet available, the filing may consist of an audited balance sheet and other available audited financial statements for the previous fiscal year, prepared under generally accepted accounting principles and accompanied by an independent auditor’s report. The agricultural cooperative association shall file an audited balance sheet and any other available audited financial statements for the most recent fiscal year end as soon as they become available, but in no event later than 90 days after the end of its fiscal year.

50.82(2) If, after the anniversary date of its initial notice filing, an agricultural cooperative association continues to issue notes or other evidence of indebtedness under its initial notice filing in order to maintain the exemption, the agricultural cooperative association shall on an annual basis file with the administrator an audited balance sheet and any other audited financial statements within 30 days of the anniversary of its initial notice filing. An agricultural cooperative association making its initial filing based upon a previous year’s audited financial statements because of the unavailability of current audited financial statements shall consider its anniversary date to be the date on which the cooperative filed the audited financial statements for the most recent fiscal year. An agricultural cooperative association not issuing notes or other evidence of indebtedness after an anniversary date of its initial filing is not required to make any further filing of financial information as a condition of qualifying for the exemption from registration.

This rule is intended to implement Iowa Code section 502.201(8B) “b.”
[ARC 2175C, IAB 9/30/15, effective 11/4/15]

191—50.83(502) Unsolicited order exemption.

50.83(1) Any unregistered broker-dealer effecting a transaction under an unsolicited order or offer to buy and claiming an exemption from registration based solely upon Iowa Code section 502.202(6) shall obtain acknowledgment from the customer on or before the settlement date of the transaction that the transaction is unsolicited.

50.83(2) The acknowledgment shall take one of the following forms:

- a. A confirmation statement, as required pursuant to subrule 50.83(1), displaying in bold print on the face of the statement the words “Unsolicited Order, Notify Immediately if Otherwise”; or
- b. A signed statement from the customer acknowledging that the order was unsolicited and containing the name of the customer, the name of the securities involved, the number of securities

involved in the transaction, the purchase price of the securities, the transaction date, and the total dollar amount, including commissions paid, of the transaction.

50.83(3) The customer will be presumed to have acknowledged that the transaction was unsolicited if the customer does not indicate otherwise on or before the settlement date.

50.83(4) A broker-dealer shall notify the administrator in writing that it is executing unsolicited orders in a security when both of the following conditions are met:

a. More than six unsolicited orders or offers to buy such security are received during any three consecutive business days; and

b. The broker-dealer is relying solely upon the exemption provided by Iowa Code section 502.202(6).

This rule is intended to implement Iowa Code section 502.202(6).

191—50.84(502) Solicitation of interest exemption.

50.84(1) An offer, but not a sale, of a security made by or on behalf of an issuer for the sole purpose of soliciting an indication of interest in receiving a prospectus (or its equivalent) for such security is exempt from registration pursuant to Iowa Code section 502.301 if:

a. The issuer is or will be a business entity organized under the laws of one of the states or possessions of the United States or one of the provinces or territories of Canada, is engaged in or proposes to engage in a business other than petroleum exploration or production or mining or other extractive industries, and is not a blind pool offering or other offering for which the specific business or properties cannot now be described.

b. The offerer intends to register the security in Iowa and conduct its offering pursuant to either Regulation A or Rule 504 of Regulation D, as promulgated by the SEC.

c. The offerer files with the administrator a SOIF along with any other materials to be used to conduct solicitations of interest including, but not limited to, the script of any broadcast to be made and a copy of any notice to be published no less than ten business days prior to the initial solicitation of interest.

d. The issuer files with the administrator all amendments to any materials filed pursuant to paragraph “c” or additional materials it proposes to use in conducting solicitations of interest, except for materials provided to a particular investor solely pursuant to a request by that investor, no less than five business days prior to use.

e. The offerer does not use any SOIF, script, advertisement, or other material which the administrator has ordered or notified the offerer may not be used for the purpose of solicitations of interest.

f. Except for scripted broadcasts and except to the extent necessary to obtain information needed to provide a SOIF, the offerer does not orally communicate with any prospective investor about the contemplated offering unless the investor is provided with the most current SOIF at or before the time of the communication or within five days after the communication.

g. The offerer does not solicit or accept money or a commitment to purchase securities during the solicitation of interest period.

h. The offerer does not make a sale until at least seven days after delivery to the purchaser of a final prospectus or delivery of a preliminary prospectus as provided by Iowa Code section 502.202(17).

50.84(2) Unless the offerer does not know, and in the exercise of reasonable care could not know, the exemption under this rule is not available for securities of an offerer, if any of the issuer’s officers, directors, promoters, or 10 percent shareholders:

a. Have filed a registration statement which is the subject of a current effective registration stop order entered under any federal or state securities law within five years prior to filing the SOIF.

b. Have been convicted within five years prior to filing the SOIF of any felony or misdemeanor regarding the offer, purchase or sale of any security or any felony involving fraud or deceit including, but not limited to, forgery, embezzlement, obtaining money under false pretenses, larceny, or conspiracy to defraud.

c. Are currently subject to any federal or state administrative enforcement order or judgment entered by any state securities administrator or the SEC within five years prior to filing the SOIF in which fraud or deceit, including, but not limited to, the making of untrue statements of material facts and omitting to state material facts, was found.

d. Are subject to any federal or state administrative order or judgment prohibiting, denying, or revoking the use of any exemption from registration regarding the offer, purchase or sale of securities.

e. Are currently subject to any order, judgment, or decree of any court of competent jurisdiction entered within five years prior to filing the SOIF temporarily, preliminarily, or permanently restraining or enjoining the person or entity from engaging in or continuing any conduct or practice regarding the purchase or sale of any security or the making of any false filing with any state.

The disqualifications listed in this subrule shall not apply if the person or entity subject to the disqualification is licensed or registered to conduct securities-related business in the state in which the administrative order or judgment was entered against the person or entity, or if the broker-dealer employing the person or entity is licensed or registered in Iowa and the Form BD filed with the administrator discloses the order, conviction, judgment, or decree. No person disqualified under this subrule may act in a capacity other than that for which the person is licensed or registered. Any disqualification caused by this subrule is automatically waived if the agency creating the disqualification determines for good cause shown that the exemption should not be denied.

50.84(3) The failure to comply with a term, condition or requirement of this rule shall not result in the loss of the exemption from the requirements of Iowa Code section 502.301 for an offer to a particular individual or entity if the offerer establishes all of the following:

a. The failure to comply did not pertain to a term, condition or requirement directly intended to protect that particular individual or entity; and

b. The failure to comply was insignificant regarding the offering as a whole; and

c. A good-faith and reasonable attempt was made to comply with all applicable terms, conditions and requirements of this rule.

Where an exemption is established only through reliance upon subrule 50.84(2), the failure to comply is still actionable as a violation of the Act by the administrator under Iowa Code section 502.603 or 502.604.

50.84(4) The offerer shall comply with the following requirements:

a. Any published notice or script for broadcast and any printed material delivered apart from the SOIF, unless a SOIF containing the disclosures described below was previously delivered to the person, shall contain, at a minimum, the identity of the chief executive officer of the issuer, a brief and general description of the issuer's business and products, and the following disclosure printed in capital letters and boldface type at least as large as that used in the body of the printed materials:

(1) NO MONEY OR OTHER CONSIDERATION IS BEING SOLICITED AND NONE WILL BE ACCEPTED.

(2) NO SALES OF SECURITIES WILL BE MADE OR A COMMITMENT TO PURCHASE ACCEPTED UNTIL THE DELIVERY OF AN OFFERING CIRCULAR THAT INCLUDES COMPLETE INFORMATION ABOUT THE ISSUER AND THE OFFERING.

(3) AN INDICATION OF INTEREST MADE BY A PROSPECTIVE INVESTOR INVOLVES NO OBLIGATION OR COMMITMENT OF ANY KIND.

(4) THIS OFFER IS BEING MADE PURSUANT TO AN EXEMPTION UNDER FEDERAL AND STATE SECURITIES LAWS. NO SALE MAY BE MADE UNTIL THE OFFERING STATEMENT IS QUALIFIED BY THE U.S. SECURITIES AND EXCHANGE COMMISSION AND IS REGISTERED IN IOWA.

b. All communications with prospective investors made in reliance upon this rule shall cease after a registration statement is filed with the administrator, and no sale may be made until at least 20 calendar days after the last communication made in reliance upon this rule.

c. A preliminary prospectus may be used with an offering for which indications of interest have been solicited under this rule only if the offering is conducted by a registered broker-dealer.

Failure to comply with the requirements of this subrule shall not result in losing the exemption from the requirements of Iowa Code section 502.301, but is a violation of the Act, is actionable by the administrator under Iowa Code section 502.603 or 502.604, and constitutes grounds for denying or revoking the exemption for specific transactions.

50.84(5) Upon written application by the offerer and for good cause shown, the administrator may waive any condition of the solicitation of interest exemption. Neither compliance nor attempted compliance with this rule, nor the absence of any objection or order by the administrator regarding an offer of securities made under this rule, constitutes a waiver of any condition of the rule or a confirmation by the administrator of the availability of the rule.

50.84(6) Offers made in reliance upon this rule shall not be integrated with subsequent offers or sales of securities registered in Iowa. Issuers on whose behalf indications of interest are solicited under this rule may not make offers or sales in reliance upon Iowa Code section 502.202(14) or rule 191—50.80(502) until at least 12 months after the last communication with a prospective investor made pursuant to this rule.

50.84(7) Nothing in this rule limits the application of Iowa Code section 502.401, 502.402, 502.501 or 502.509 to offers made in reliance upon this rule.

50.84(8) The administrator may review the materials filed under this rule. Materials filed, if reviewed, will be judged under antifraud principles. Any discussion in the offering documents of the potential rewards of the investment must be balanced by a discussion of the possible risks.

50.84(9) Any offer effected in violation of this rule may constitute an unlawful offer of an unregistered security for which civil liability attaches under Iowa Code section 502.501 et seq. Any misrepresentation or omission may also give rise to civil liability under the Act. A subsequent registration of the security does not cure the previous unlawful offer. Only a rescission offer made in compliance with the Act can effect a cure.

This rule is intended to implement Iowa Code section 502.202(17).

191—50.85(502) Internet offers exemption. Offers of securities made by, or on behalf of, issuers on or through the Internet are exempt from registration pursuant to Iowa Code sections 502.301 and 502.504 if:

1. The Internet offer states, directly or indirectly, that the securities are not being offered to state residents; and
2. The Internet offer is not specifically directed to any person in Iowa by, or on behalf of, the issuer of the securities; and
3. No sales of the issuer's securities are made in Iowa as a result of the Internet offering until such time as the securities being offered have been registered under Iowa Code sections 502.301 and 502.504, and a final prospectus or Form U-7 is delivered to Iowa investors prior to such sales, or the issuer qualifies for the exemption provided in Iowa Code section 502.202(13).

This rule is intended to implement Iowa Code section 502.203.

191—50.86(502) Denial, suspension, revocation, condition, or limitation of limited offering transaction exemption. The administrator shall view the following as reasons for entering an order under Iowa Code section 502.204 to deny or revoke an exemption provided under Iowa Code section 502.202(14):

1. A public advertisement is used to promote the sale of securities for which such exemption is claimed; or
2. The offering is part of a registered offering under the Securities Act of 1933.

This rule is intended to implement Iowa Code section 502.204.

191—50.87(502) Nonprofit securities exemption.

50.87(1) Church extension funds or similar organizations making continuous offerings shall be exempt pursuant to Iowa Code section 502.201(7) "b" provided the issuer:

- a. Applies for the exemption;
- b. Files an offering circular and otherwise substantially complies with the NASAA Statement of Policy Regarding Church Extension Funds as adopted by the NASAA membership on April 17, 1994, and amended by the NASAA membership on April 18, 2004, and published in CCH NASAA Reports at paragraph 1951;

- c. Files all sales and advertising literature;
- d. Files a consent to service of process;
- e. Unless disallowed by the administrator within 15 days after the applicant has filed the items required by paragraphs 50.87(1)“a” to “d,” is authorized beginning 15 days after the filing is received to sell pursuant to the exemption;
- f. After authorization, may sell securities for a period of 12 months; and
- g. Upon the expiration of the 12-month period in paragraph 50.87(1)“f,” files a renewal application that complies with the requirements of this subrule.

50.87(2) Church bonds and other one-time offerings for a single specific project shall be exempt pursuant to Iowa Code section 502.201(7)“a” provided the issuer:

- a. Files a notice specifying the material terms of the offering that comply with the NASAA Statement of Policy Regarding Church Bonds as adopted by the NASAA membership on April 14, 2002, and published in CCH NASAA Reports at paragraph 1001; and
- b. Files a consent to service of process.

This rule is intended to implement Iowa Code section 502.201(7).

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.88(502) Transactions with specified investors. The administrator grants the exemption for transactions with specified investors to the following persons:

50.88(1) Any director, executive officer, or general partner of the issuer of the securities being offered or sold, or any director, executive officer, or general partner of a general partner of that issuer.

50.88(2) Any natural person whose individual net worth, or joint net worth with that person’s spouse, at the time of the purchase exceeds \$1 million, excluding the value of the primary residence of the natural person.

50.88(3) Any natural person who had an individual income in excess of \$200,000 in each of the two most recent years or joint income with that person’s spouse in excess of \$300,000 in each of those years and has a reasonable expectation of reaching the same income level in the current year.

50.88(4) Any venture or seed capital company. For purposes of this subrule, a venture or seed capital company is a corporation, partnership or association that has been in existence for five years or whose net assets exceed \$250,000 and whose primary business is investing in developmental stage companies or “eligible small business companies” as that term is defined in the regulations of the Small Business Administration.

This rule is intended to implement Iowa Code section 502.202(13).

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.89(502) Designated securities manuals. Nationally recognized securities manuals for purposes of Iowa Code section 502.202(2)“d” include Mergent’s Manuals, S & P Capital IQ Standard Corporation Descriptions, Fitch Investment Services, and Best’s Insurance Reports, Life-Health.

This rule is intended to implement Iowa Code section 502.202(2)“d.”

[ARC 1076C, IAB 10/2/13, effective 11/6/13]

191—50.90(502) Intrastate crowdfunding exemption.

50.90(1) Definitions. For purposes of this rule, in addition to the definitions set forth in rule 191—50.1(502), the definitions in Iowa Code section 502.202(24)“a” and the following definitions apply:

“*Administrator’s website*” means the Internet site of the Iowa insurance division, iid.iowa.gov.

“*Escrow agent*” means a bank, trust company, savings bank, national banking association, building and loan association, mortgage banker, credit union, insurance company, or any other independent escrow agent acceptable to the commissioner.

“*Issuer*” means a person that is authorized to do business in Iowa and has been approved by the administrator as a crowdfunding issuer pursuant to subrule 50.90(5).

“*Management*” means an issuer’s directors, executive officers, or the individuals who perform such functions for the issuer.

“*Portal website*” means the Internet site through which a registered Iowa crowdfunding portal conducts offers and sales of exempt securities under Iowa Code section 502.202(24).

“*Principal place of business*” means the state or territory from which the officers, partners, or managers of a corporation, partnership, limited liability company, trust or other form of business primarily direct, control and coordinate the activities of the business. “Principal place of business” is not related to “place of business” as defined in Iowa Code section 502.102(21).

50.90(2) Exemption from registration.

a. Under the authority delegated to the administrator to promulgate rules in Iowa Code sections 502.203 and 502.605(1), a transaction is exempt from the registration provisions of the Act if all of the conditions in subparagraphs (1) to (4) are met:

(1) The issuer of the securities is at the time of any offers and sales a person that is a resident and doing business within the state of Iowa. The issuer shall be deemed to be a resident of the state of Iowa if it has its principal place of business in Iowa. The issuer shall be deemed to be doing business within Iowa if the issuer satisfies at least one of the following requirements:

1. The issuer derived at least 80 percent of its consolidated gross revenues from the operation of a business or of real property located in or from the rendering of services within the state of Iowa.

2. The issuer had, at the end of its most recent semiannual fiscal year prior to an initial offer of securities in any offering or subsequent offering pursuant to this rule, at least 80 percent of its assets and those of its subsidiaries on a consolidated basis located in the state of Iowa.

3. The issuer intends to use and uses at least 80 percent of the net proceeds to the issuer from sales made pursuant to this rule in connection with the operation of a business within, the operation of real property within, the purchase of real property located in, or the rendering of services within the state of Iowa.

4. A majority of the issuer’s employees are based in the state of Iowa.

(2) Sales of securities pursuant to this rule are made only to residents of the state of Iowa or to persons who the issuer reasonably believes, at the time of the sale, are residents of the state of Iowa. An individual shall be deemed to be a resident of the state of Iowa if such individual has, at the time of sale, the individual’s principal residence in the state of Iowa. A trust that is not deemed by Iowa law to be a separate legal entity is deemed to be a resident of the state of Iowa only if all of the trust’s trustees are residents of the state of Iowa. For purposes of determining the residence of a purchaser:

1. A corporation, partnership, limited liability company, trust or other form of business organization shall be deemed a resident of the state of Iowa if, at the time of sale to it, it has its principal place of business within the state of Iowa.

2. A corporation, partnership, trust or other form of business organization that is organized for the specific purpose of acquiring securities offered pursuant to this rule shall not be a resident of Iowa unless all of the beneficial owners of such organization are residents of Iowa.

(3) The issuer is not, before or as a result of the offering, any of the following:

1. An investment company registered or required to be registered under the Investment Company Act of 1940 (15 U.S.C. 80a-1 et seq.).

2. A hedge fund, commodity pool, or similar investment vehicle.

3. A development stage company that either has no specific business plan or purpose or has indicated that the company’s business plan is to engage in a merger or acquisition with an unidentified company or companies, or other entity or person.

4. A company with a class of securities registered under the federal Securities Exchange Act of 1934.

(4) The offering is sold in compliance with the requirements of SEC Rule 147A (17 CFR 230.147A).

b. All offers and sales of securities made in reliance upon this rule shall be made through an intermediary’s Internet site.

50.90(3) Integration.

a. Offers and sales made in reliance on this rule may be integrated with other offers and sales when the following factors apply:

- (1) The sales are part of a single plan of financing;
- (2) The sales involve the issuance of the same class of securities;
- (3) The sales have been made at or about the same time;
- (4) The same type of consideration is received; and
- (5) The sales are made for the same general purpose.

b. Offers and sales made in reliance on this rule shall not be integrated with offers and sales made more than six months before the start of the offering or more than six months after completion of an offering, so long as during those six-month periods there are no offers or sales of securities by or for the issuer that are of the same class or of a similar class as those offered or sold under these rules, other than those offers or sales of securities under an employee benefit plan.

50.90(4) *Bad actor disqualification.*

a. The exemption of 50.90(2) shall not be available if the issuer; any predecessor of the issuer; any affiliated issuer; any director, executive officer, other officer participating in the offering, general partner or managing member of the issuer; any beneficial owner of 20 percent or more of the issuer's outstanding voting equity securities, calculated on the basis of voting power; any promoter connected with the issuer in any capacity at the time of such offer or sale; any investment manager of an issuer that is a pooled investment fund; any person that has been or will be paid (directly or indirectly) remuneration for solicitation of purchasers in connection with such offer or sale of securities; any general partner or managing member of any such investment manager or solicitor; or any director, executive officer, or other officer participating in the offering of any such investment manager or solicitor or general partner or managing member of such investment manager or solicitor:

(1) Has been convicted, within ten years before such offer or sale (or five years, in the case of issuers, their predecessors and affiliated issuers), of any felony or misdemeanor that is any of the following:

1. In connection with the purchase or sale of any security.
2. Involving any making of any false filing with the SEC or a state securities commission or agency or state official performing like functions.
3. Arising out of the conduct of the business of an underwriter, broker, dealer, municipal securities dealer, investment adviser or paid solicitor of purchasers of securities;

(2) Is subject to any order, judgment or decree of any court of competent jurisdiction, entered within five years before such offer or sale that, at the time of such offer or sale, restrains or enjoins such person from engaging or continuing to engage in any conduct or practice that is any of the following:

1. In connection with the purchase or sale of any security.
2. Involving the making of any false filing with the SEC or a state securities commission or agency or state official performing like functions.
3. Arising out of the conduct of the business of an underwriter, broker, dealer, municipal securities dealer, investment adviser or paid solicitor of purchaser of securities;

(3) Is subject to a final order of a state securities commission or agency or state official performing like functions; a state authority that supervises or examines banks, savings associations, or credit unions; a state insurance commission or agency or state official performing like functions; an appropriate federal banking agency; the U.S. Commodity Futures Trading Commission; or the National Credit Union Administration that:

1. At the time of such offer or sale, bars the person from:
 - Association with an entity regulated by such commission, authority, agency, or officer;
 - Engaging in the business of securities, insurance or banking; or
 - Engaging in savings association or credit union activities; or
2. Constitutes a final order based on a violation of any law or regulation that prohibits fraudulent, manipulative, or deceptive conduct, including making untrue statements of material facts or omitting to state material facts, entered within ten years before such offer or sale;

(4) Is subject to an order of the SEC entered pursuant to the Securities Exchange Act of 1934 (15 U.S.C. Section 78o(b) or 78o-4(c)) or the Investment Advisers Act of 1940 (15 U.S.C. Section 80b-3(e) or (f)) that, at the time of such offer or sale:

1. Suspends or revokes such person's registration as a broker, dealer, municipal securities dealer or investment adviser;

2. Places limitations on the activities, functions or operations of such person; or

3. Bars such person from being associated with any entity or from participating in the offering of any penny stock;

(5) Is subject to any order of the SEC entered within five years before such offer or sale that, at the time of such offer or sale, orders the person to cease and desist from committing or causing a violation or future violations of:

1. Any scienter-based, antifraud provision of the federal securities laws, including without limitation the Securities Act of 1933 (15 U.S.C. Section 77q(a)(1)); the Securities Exchange Act of 1934 (15 U.S.C. Section 78j(b) and 17 CFR 240.10b-5); the Securities Exchange Act of 1934 (15 U.S.C. Section 78o(c)(1)); the Investment Advisers Act of 1940 (15 U.S.C. Section 80b-6(1)); or any other rule or regulation thereunder; or

2. Section 5 of the Securities Act of 1933 (15 U.S.C. 77e);

(6) Is suspended or expelled from membership in, or suspended or barred from association with a member of, a registered national securities exchange or a registered national or affiliated securities association for any act or omission to act constituting conduct inconsistent with just and equitable principles of trade;

(7) Has filed (as a registrant or issuer), or was or was named as an underwriter in, any registration statement or Regulation A offering statement filed with the SEC that, within five years before such offer or sale, was the subject of a refusal order, stop order, or order suspending the Regulation A exemption, or is, at the time of such offer or sale, the subject of an investigation or proceeding to determine whether a stop order or suspension order should be issued;

(8) Is subject to a United States Postal Service false representation order entered within five years before such offer or sale, or is, at the time of such offer or sale, subject to a temporary restraining order or preliminary injunction with respect to conduct alleged by the United States Postal Service to constitute a scheme or device for obtaining money or property through the mail by means of false representations;

(9) Has filed a registration statement which is subject to a final stop order entered under any state's securities law within five years before such offer or sale; or

(10) Is currently subject to any final state administrative enforcement order or judgment entered by a state's securities administrator within five years prior to such offer or sale.

b. Paragraph 50.90(4)“*a*” shall not apply under either of the following circumstances:

(1) Upon a showing of good cause and without prejudice to any other action by the commissioner, if the commissioner determines that it is not necessary under the circumstances that the exemption be denied; or

(2) If the issuer establishes that it did not know and, in the exercise of reasonable care, could not have known that a disqualification existed under this subrule. An issuer will not be able to establish that it has exercised reasonable care unless it has made, in light of the circumstances, factual inquiry into whether any disqualifications exist. The nature and scope of the factual inquiry will vary based on the facts and circumstances concerning, among other things, the issuer and the other offering participants.

c. Events relating to any affiliated issuer that occurred before the affiliation arose will be not considered disqualifying if the affiliated entity is not:

(1) In control of the issuer; or

(2) Under common control with the issuer by a third party that was in control of the affiliated entity at the time of such events.

50.90(5) Filing requirements for issuers.

a. An issuer may declare an offering exempt for a maximum of 12 months and rely on this intrastate sales exemption if the issuer submits at the administrator's website, and receives approval from the administrator, at least 30 days prior to the offer of any security in reliance upon Iowa Code section 502.202(24), all of the following:

(1) A properly completed Iowa Crowdfunding Notice Filing Form (available at the administrator's website).

(2) The issuer's articles of incorporation or other charter documents pursuant to which the issuer is organized.

(3) The issuer's bylaws or operating agreement and all amendments thereto.

(4) A copy of any resolutions setting forth terms and provisions of the securities being issued.

(5) The issuer's financial statements as of the end of the issuer's most recent fiscal year, prepared in accordance with generally accepted accounting principles. If the date of the most recent fiscal year end is more than 90 days prior to the date of the filing, the issuer must also submit an unaudited balance sheet and unaudited statement of income or operations, both prepared in accordance with generally accepted accounting principles for the issuer's most recent fiscal year.

(6) A copy of any agreements between the issuer and any intermediary.

(7) A copy of any subscription agreement for the purchase of securities in the offering.

(8) A copy of the escrow agreement between the issuer and an escrow agent for the deposit of offering proceeds.

(9) A specimen or copy of the security to be offered, including required legends, if the issuer will issue physical certificates.

(10) A copy of all advertising and other materials directed to or to be furnished to investors in the offering.

(11) A copy of all disclosure documents directed to or to be furnished to investors in the offering.

(12) Any other information reasonably requested by the commissioner.

(13) A filing fee of \$100.

b. If an issuer will make offers and sales of an offering after the exempt offering period declared by the issuer on the Iowa Crowdfunding Notice Filing Form, the issuer must renew the offering exemption by submitting at the administrator's website, and receiving approval of the administrator, at least 30 days prior to the expiration of the original exempt offering period, all of the following:

(1) A report of sales as of the most recent practical date that includes the following information:

1. The time period in which the offering was open.

2. The number of shares or units sold in the offering.

3. The number of investors that purchased shares or units in the offering.

4. The dollar amount sold in the offering.

(2) A copy of the issuer's updated Iowa Crowdfunding Notice Filing Form.

(3) The issuer's financial statements as of the end of the issuer's most recent fiscal year, prepared in accordance with generally accepted accounting principles. If the end date of the most recent fiscal year is more than 90 days prior to the date of renewal, the issuer also shall submit an unaudited balance sheet and an unaudited statement of income or operations, both prepared in accordance with generally accepted accounting principles for the issuer's most recent fiscal quarter.

(4) A renewal filing fee of \$100.

c. Upon completion of an offering made in reliance upon this rule, an issuer shall file at the administrator's website, and receive the administrator's approval of, a final sales report that includes all of the following information:

(1) The time period in which the offering was open.

(2) The number of shares or units sold in the offering.

(3) The number of investors that purchased shares or units in the offering.

(4) The total dollar amount sold in the offering.

50.90(6) *Minimum offering amount.* The issuer shall establish a minimum offering amount that is sufficient, together with other sources of financing, to implement the business plan of the issuer, as disclosed in the submitted offering information.

50.90(7) *Escrow agreement.* The issuer must enter into an escrow agreement with an independent escrow agent to hold funds in an escrow account, and the escrow agreement shall include all of the following terms:

a. All offering proceeds shall be maintained in an account controlled by the escrow agent.

b. All offering proceeds will be released to the issuer only when the aggregate capital raised from all purchasers that have signed commitments to invest is equal to or greater than the minimum

offering amount disclosed in the offering materials submitted to the administrator with the issuer's filing of paragraph 50.90(5) "a."

c. If the proceeds do not meet the minimum offering amount disclosed in the offering materials within one year of the earlier of the commencement of the offering or the first posting of the offering on the Internet, the issuer shall return all funds to investors.

d. None of the following shall have any claim to the escrowed proceeds:

- (1) A creditor of an escrow agent.
- (2) An affiliate of an escrow agent.
- (3) A creditor of the issuer.
- (4) An affiliate of the issuer.
- (5) A creditor of an intermediary engaged by the issuer.
- (6) An affiliate of an intermediary engaged by the issuer.

e. The escrow agent agrees to maintain its independence from the issuer, any intermediary or Iowa crowdfunding portal assisting with the offering, and the officers, directors, managing members, and affiliates of the issuer or any Iowa crowdfunding portal assisting with the offering.

f. The commissioner may inspect the records of the impound account maintained by the escrow agent at any reasonable time at the location of the records and copy any record.

g. The escrow agreement must be signed by an officer of the issuer and an authorized representative of the escrow agent.

h. The escrow agent may not be affiliated with the issuer, any Iowa crowdfunding portal assisting with the offering, or any officers, director, managing member, or affiliate of the issuer or any intermediary assisting with the offering.

i. If the minimum offering amount is not received by the end of the offering period, the proceeds shall be returned to the purchasers within 30 days.

j. All purchasers shall have the right to withdraw their investments, without deduction of any kind, until such time as offering proceeds totaling at least the minimum offering amount are received.

50.90(8) Disclosure requirements for issuers.

a. Nothing in this exemption is intended to or should be in any way construed as relieving issuers or persons acting on behalf of issuers from providing disclosure to prospective investors adequate to satisfy the requirements of rule 191—50.90(502) and the antifraud provisions of Iowa Code chapter 502. The issuer is required to provide full and fair disclosure to investors of all material facts relating to the issuer and the securities being offered. If eligible, the issuer may use Form U-7, which may be obtained from the NASAA website at www.nasaa.org.

b. Among other risk disclosures, the issuer must provide the substance of all of the following disclosures to all prospective purchasers and investors:

(1) There is no ready market for the sale of the securities acquired in this offering. It may be difficult or impossible for an investor to sell or otherwise dispose of this investment. An investor may be required to hold and bear the financial risks of this investment indefinitely.

(2) No federal or state securities commission or regulatory authority has confirmed the accuracy or determined the adequacy of the disclosures provided.

(3) In making an investment decision, investors must rely on their own examination of the issuer and the terms of the offering, including the merits and risks involved.

(4) The securities have not been registered under federal or state securities laws and, therefore, cannot be resold unless the securities are registered or qualify for an exemption from registration under federal and state law.

50.90(9) Books and records. An issuer that has filed under this rule must keep and maintain written or electronic records relating to offers and sales of securities made in reliance upon this rule for at least six years following termination of the offering. These records are subject to such reasonable audits or inspections by the administrator or a representative of the administrator as the administrator considers necessary or appropriate in the public interest and for the protection of investors. An audit or inspection may be made at any time and without prior notice. The administrator may copy, and remove for audit

or inspection copies of, all records the administrator reasonably considers necessary or appropriate to conduct the audit or inspection.

50.90(10) Iowa crowdfunding portal registration.

a. To register as an Iowa crowdfunding portal, a person shall submit to the administrator at the administrator's website all of the following:

(1) A completed Iowa Crowdfunding Portal Registration Form, available on the administrator's website, including all required schedules and supplemental information.

(2) A completed Form U-4, available on the administrator's website, for each agent as defined in Iowa Code section 502.102(2).

(3) Any other information requested by the administrator to determine the financial responsibility, business reputation, or qualifications of the Iowa crowdfunding portal.

(4) The registration fee of \$100.

b. The person must receive approval of the submission and registration by the administrator before the person may operate as an Iowa crowdfunding portal.

c. Registration expires at the close of the calendar year in which a registration was issued, but the registration may be renewed for the succeeding year by submission to the administrator at the administrator's website of both a \$100 registration fee and a written request for renewal, including any material changes to the information submitted in the prior registration submission.

50.90(11) Duties of an Iowa crowdfunding intermediary.

a. *Maintenance of intermediary website.* An Iowa crowdfunding intermediary shall create and maintain the intermediary website and make information and services available on or through the intermediary website in compliance with this rule.

b. *Background and regulatory checks.* Prior to offering securities to residents of Iowa, the intermediary shall conduct a reasonable investigation of the background and history of each issuer whose securities are offered on the intermediary website and of each issuer's control persons. "Control persons" for the purpose of this subrule means the issuer's officers; directors; or other persons having the power, directly or indirectly, to direct the management or policies of the issuer, whether by contract or otherwise; and persons holding more than 20 percent of the outstanding equity of the issuer. The intermediary shall deny an issuer access to the intermediary website if there is a reasonable basis to believe that one or more of the following are true:

(1) The issuer or any of its control persons is subject to disqualification under subrule 50.90(3).

(2) The issuer has engaged in, the issuer is engaging in, or the offering involves any act, practice, or course of business that will, directly or indirectly, operate as a fraud or deceit upon any person.

(3) The intermediary cannot adequately or effectively assess the risk of fraud by the issuer or by the issuer's potential offering.

c. *Purchaser screening.* Before a security is sold through the intermediary, the intermediary shall ensure that the purchaser does all of the following:

(1) Reviews the information provided in the offering documents.

(2) Provides to the intermediary an affirmative representation from the purchaser acknowledging receipt of the disclosure statement provided to the purchaser by the issuer pursuant to subrule 50.90(8).

(3) Provides to the intermediary an affirmative representation that the purchaser is an Iowa resident.

d. *Information about the issuer and the offering.* The intermediary shall make available on the intermediary website information about the issuer and the offering. The information shall include all of the following:

(1) A copy of the disclosure statement required by subrule 50.90(8).

(2) A summary of the offering, including all of the following:

1. A description of the entity; its form of business, principal office, history, and business plan; and its intended use of offering proceeds, including compensation paid to any owner, executive officer, director, or manager.

2. The identity of the executive officers, directors, and managers, including their titles and their prior experience and the identity of all persons owning more than 20 percent of the ownership interests of any class of securities of the company.

3. A description of the securities being offered and any outstanding securities of the company, the amount of the offering, and the percentage of ownership of the company represented by the offered securities.

e. Intermediary website forum. The intermediary shall maintain a forum on the intermediary website. The forum shall be available to all potential purchasers as well as to the administrator. The intermediary website shall contain a disclaimer that reflects that access to securities offered on the intermediary website is limited to Iowa residents and that sales of the securities appearing on the intermediary website are limited to persons that are Iowa residents. Potential purchasers may ask questions and receive answers concerning the terms and conditions of the offering and may obtain additional information which the crowdfunding issuer possesses or can acquire without unreasonable effort or expense necessary to verify the accuracy of or to clarify the information provided on the intermediary website. The intermediary may adopt reasonable rules and procedures for the website forum, including registration and authentication requirements.

f. Enforcement of limits. The intermediary shall take reasonable measures to ensure that no purchaser exceeds the limits set forth in Iowa Code section 502.202(24) “c” and “d.”

g. Administrator access. The intermediary shall provide the administrator purchaser-level access at all times to the intermediary website, pursuant to Iowa Code section 502.202(24) “g”(8).

50.90(12) Prohibited conduct for intermediaries. An intermediary and individuals of the intermediary’s management:

a. Shall not have ownership or other financial interest greater than 20 percent in the crowdfunding issuer.

b. Shall not hold, manage, possess, or otherwise handle purchaser funds. Proceeds are to be held in escrow until the minimum impound amount has been met.

c. Shall not compensate employees, agents or other persons not registered with the administrator for soliciting offers or sales of securities displayed or referenced on the intermediary website.

50.90(13) Commissions, fees or other remuneration. Commissions, fees or other remuneration for soliciting any prospective purchaser in connection with the offering shall only be paid to intermediaries or any other persons who are appropriately registered or licensed with the commissioner.

50.90(14) Advertising and communications.

a. Advertising. The crowdfunding issuer shall not advertise the specific details of the offering, except for notices which direct potential purchasers to the intermediary website. Notwithstanding the foregoing, the issuer may distribute a notice that the issuer is conducting an offering of securities, the name of the intermediary through which the offering is being conducted, and a link directing the potential investor to the intermediary. The notice shall contain a disclaimer that the sale of the security is limited to persons who are Iowa residents.

b. Communications. All communications between the issuer and potential purchasers taking place pursuant to Iowa Code section 502.202(24) shall occur through the intermediary website of the intermediary. During the time the securities are being offered on the intermediary website, the intermediary shall, pursuant to paragraphs 50.90(11) “d” and “e,” provide channels through which potential purchasers can communicate with one another and with the issuer about the securities being offered. These communications shall be visible to all those with access to the intermediary website.

(1) An issuer shall respond within ten days to requests for information made by potential purchasers or by the administrator through the intermediary website.

(2) If such additional information is material and not previously included on the intermediary website, the crowdfunding issuer and the Iowa crowdfunding portal shall immediately amend the information contained on the intermediary website.

50.90(15) Offering price. The offering price of the securities offered and sold pursuant to this exemption shall be the same for all purchasers and shall not be increased during the offering period. The offering price may be lowered, but only if all previous purchasers in the particular offering are notified of the change and allowed to rescind their previous investment and participate at the lower offering price.

50.90(16) Resale of securities. On the document that is to serve as evidence of ownership, the issuer shall place a prominent notice which states that the securities have not been registered and which sets forth limitations on resale contained in SEC Rule 147A(e) (17 CFR 230.147A(e)), including that, for a period of six months from the date of last sale by the issuer of the securities in the offering, resale by any person shall be made only to Iowa residents.

This rule is intended to implement Iowa Code section 502.202.
[ARC 3741C, IAB 4/11/18, effective 5/16/18]

191—50.91(502) Notice filing requirement for federal crowdfunding offerings. This rule applies to offerings made under 17 CFR Section 227, federal Regulation Crowdfunding, General Rules and Regulations, and Sections 4(a)(6) and 18(b)(4)(C) of the Securities Act of 1933 (referred to collectively as “federal Regulation Crowdfunding”).

50.91(1) Initial filing.

a. An issuer that offers and sells securities in this state in an offering that is exempt under federal Regulation Crowdfunding and that either (1) has its principal place of business in this state or (2) sells 50 percent or greater of the aggregate amount of the offering to residents of this state shall file with the administrator the following related to that exempt offering:

(1) A completed Uniform Notice of Federal Crowdfunding Offering form (Form U-CF, accessible through www.nasaa.org/industry-resources/uniform-forms/) or copies of all documents the issuer filed with the Securities and Exchange Commission related to that exempt offering;

(2) If the issuer is not filing on the Uniform Notice of Federal Crowdfunding Offering form, a completed consent to service of process form (Form U2, accessible through www.nasaa.org/industry-resources/uniform-forms/); and

(3) A filing fee of \$100.

b. If the issuer has its principal place of business in this state, the filing required under paragraph 50.91(1) “a” shall be filed with the administrator when the issuer makes its Initial Form C filing with the SEC under the federal Regulation Crowdfunding concerning the offering with the SEC. If the issuer does not have its principal place of business in this state but residents of this state have purchased 50 percent or greater of the aggregate amount of the offering, the filing required under paragraph 50.91(1) “a” shall be filed when the issuer becomes aware that such purchases have met this threshold and in no event later than 30 days from the date of completion of the offering.

c. The initial notice filing is effective for 12 months from the date of the filing with the administrator.

50.91(2) Renewal. For each additional 12-month period in which the same offering described in paragraph 50.91(1) “a” is continued, an issuer conducting an offering under federal Regulation Crowdfunding may renew its notice filing by filing with the administrator the following on or before the expiration of the notice filing:

a. A completed Uniform Notice of Federal Crowdfunding Offering form (Form U-CF, accessible through www.nasaa.org/industry-resources/uniform-forms/), marked “renewal,” or a cover letter or other document requesting renewal; and

b. A renewal filing fee of \$100.

This rule is intended to implement Iowa Code section 502.202.
[ARC 3391C, IAB 10/11/17, effective 11/15/17]

191—50.92(502) Notice filing requirement for Regulation A – Tier 2 offerings. This rule applies to an issuer offering and selling securities in this state in an offering exempt under Tier 2 of 17 CFR Section 230.251 et seq. (“federal Regulation A”) and Sections 18(b)(3) and 18(b)(4) of the Securities Act of 1933:

50.92(1) Initial filing.

a. An issuer planning to offer and sell securities in this state in an offering exempt under Tier 2 of federal Regulation A shall submit the following to the administrator at least 21 calendar days prior to the initial sale in this state:

(1) Either a completed Uniform Notice Filing of Regulation A – Tier 2 Offering form (accessible through www.nasaa.org/industry-resources/uniform-forms/) or copies of all documents the issuer filed with the Securities and Exchange Commission related to that Tier 2 offering;

(2) If the issuer is not filing on the Uniform Notice Filing of Regulation A – Tier 2 Offering form, a completed consent to service of process form (Form U2, accessible through www.nasaa.org/industry-resources/uniform-forms/); and

(3) A filing fee of \$400.

b. The initial filing is effective for 12 months from the date of the filing with the administrator.

50.92(2) Renewal. For each additional 12-month period in which the same offering described in paragraph 50.92(1) “*a*” is continued, an issuer conducting a Tier 2 offering under federal Regulation A may renew its notice filing by filing with the administrator the following on or before the expiration of the notice filing:

a. One of the following: the Uniform Notice Filing of Regulation A – Tier 2 Offering form (accessible through www.nasaa.org/industry-resources/uniform-forms/), a notice filing form marked “renewal,” or a cover letter or other document requesting renewal; and

b. A renewal filing fee of \$400.

This rule is intended to implement Iowa Code section 502.303.

[ARC 3391C, IAB 10/11/17, effective 11/15/17]

191—50.93 to 50.99 Reserved.

DIVISION VII
FRAUD AND OTHER PROHIBITED CONDUCT

191—50.100(502) Fraudulent practices.

50.100(1) An issuer of securities registered under the Act, or any person who is an officer, director or controlling person of such issuer, is presumed to employ a “device, scheme or artifice to defraud” the purchasers of such securities under Iowa Code section 502.501(1) if such person applies, authorizes or causes to be applied any material part of the proceeds from the sale of such securities in any material way contrary to the purposes specified in the prospectus used in offering such securities and not reasonably related to the business of the issuer as described in the prospectus.

50.100(2) A broker-dealer or agent employing one or more of the following practices engages in an “act, practice, or course of business which operates or would operate as a fraud” under Iowa Code section 502.501(3):

a. Entering into any security transaction with a customer at an unreasonable price or at a price not reasonably related to the current market price of the security or receiving an unreasonable commission or profit.

b. Contradicting or negating the importance of any information contained in a prospectus or other offering materials with intent to deceive or mislead or using any advertising or sales presentation in a deceptive or misleading manner.

c. In connection with the offer, sale, or purchase of a security, falsely leading a customer to believe that the broker-dealer or agent possesses material, nonpublic information impacting the value of the security.

d. In connection with the solicitation of a sale or purchase of a security, engaging in a pattern or practice of making contradictory recommendations to different investors of similar investment objectives for some to sell and others to purchase the same security, at or about the same time, when the recommendation is not justified by the particular circumstances of each investor.

e. Failing to make a bona fide public offering of all the securities allotted to a broker-dealer for distribution by, among other things, (1) transferring securities to a customer, another broker-dealer or a fictitious account with the understanding that those securities will be returned to the broker-dealer or its nominees, or (2) parking or withholding securities.

f. Effecting any transaction in, or inducing the purchase or sale of, any security by means of any manipulative, deceptive or other fraudulent device or contrivance including, but not limited to, the use

of “boiler-room” tactics such as repeated or harassing unsolicited telephone calls or the use of fictitious or nominee accounts.

50.100(3) Although nothing in this rule precludes applying the general antifraud provisions to any person who engages in practices similar to paragraphs “a” through “h” listed below, the listed practices apply only to soliciting a purchase or sale of OTC non-NASDAQ equity securities and excludes interests in direct participation programs and shares in open-end mutual funds:

- a. Failing to disclose the entity’s present bid and ask price of a particular security at the time of solicitation.
- b. Failing to advise the customer, both at the time of solicitation and on confirmation, of the total of all charges and fees related to a specific securities transaction.
- c. In connection with a principal transaction, failing to disclose, both at the time of solicitation and upon confirmation, a short inventory position in the entity’s account of more than 5 percent of the issued and outstanding shares of that class of securities of the issuer, if the entity is a market maker at the time of solicitation.
- d. Conducting sales contests in a particular security.
- e. After a solicited purchase by a customer, failing or refusing, for a principal transaction, to promptly execute sell orders.
- f. Refusing to sell existing securities held by the customer unless the customer executes a purchase transaction.
- g. Soliciting a secondary market when there has not been a bona fide distribution in the primary market.
- h. Engaging in a pattern of compensating an agent in different amounts for effecting sales and purchases in the same security.

This list is not intended to be all-inclusive. Engaging in other conduct including, but not limited to, forgery, embezzlement, conversion, nondisclosure, incomplete disclosure or misstatement of material facts may also be deemed fraudulent.

This rule is intended to implement Iowa Code section 502.501.

191—50.101(502) Rescission offers.

50.101(1) Rescission offers made pursuant to Iowa Code section 502.510 shall be typed or printed and shall be captioned “RESCISSION OFFER” in boldface print or type. The rescission offer shall be delivered to each offeree personally or shall be sent by certified mail to the offeree’s last-known address and shall contain the following information:

- a. The name of the security which is the subject of the offer.
- b. A reasonably detailed statement indicating why liability under Iowa Code section 502.509 may have arisen and fairly and adequately advising the offeree of the offeree’s rights pursuant to the Act.
- c. An offer to repurchase the security pursuant to Iowa Code section 502.510(1) “b” to “f,” as applicable.
- d. A statement that the offeree’s right to bring an action under the Act may be lost unless the offeree accepts the offer within 30 days after receiving the offer, or any shorter period, of not less than three days, that the administrator, by order, specifies.
- e. Sufficient information about the issuer and the security offered to permit the offeree to make an informed decision regarding acceptance of the rescission offer including, but not limited to, information about the issuer’s organization and management, its operations and plan of business, and its financial condition as shown by a current financial statement prepared under generally accepted accounting principles.
- f. A form by which the offeree may accept the offer and a statement explaining that the offeree may accept the offer by returning the form to the offerer at the provided address by first-class mail, or any other type of mail.
- g. If the basis for relief under Iowa Code section 502.510 alleges a violation of Iowa Code section 502.509 which employed a device, scheme, or artifice to defraud, made an untrue statement of material fact necessary in order to make the statement made, in light of the circumstances under which it was

made, not misleading, or engaged in an act, practice, or course of business that operated or would operate as a fraud or deceit on another person, in capital letters and boldface type at least as large as that used in the body of the printed materials, and placed immediately before the signature of the offerer, the following statement:

THIS IS A RESCISSION OFFER MADE PURSUANT TO Iowa Code section 502.510, A COPY OF WHICH IS ON FILE WITH THE IOWA SECURITIES AND REGULATED INDUSTRIES BUREAU. THE BUREAU MAKES NO RECOMMENDATION AS TO WHETHER THE OFFER SHOULD BE ACCEPTED OR REJECTED NOR HAS THE BUREAU PASSED UPON THE ADEQUACY OR ACCURACY OF THIS OFFER.

50.101(2) If the basis for relief under Iowa Code section 502.510 alleges a violation of Iowa Code section 502.509 which employed a device, scheme, or artifice to defraud, made an untrue statement of material fact necessary in order to make the statement made, in light of the circumstances under which it was made, not misleading, or engaged in an act, practice, or course of business that operated or would operate as a fraud or deceit on another person, prior to making a rescission offer pursuant to Iowa Code section 502.510, the offerer shall file with the administrator:

- a. A copy of the rescission offer;
- b. The names and addresses of all holders or sellers who are to receive the rescission offer; and
- c. Financial statements proving that the offerer's assets are sufficient to meet its obligations should all offerees accept the rescission offer.

50.101(3) Rescission offers made pursuant to Iowa Code section 502.510 shall be tendered to all persons to whom liability exists or may exist pursuant to Iowa Code section 502.509.

50.101(4) A rescission offer may be accepted at any time during the period stated in the rescission offer even if an offeree previously rejected the offer.

50.101(5) Rescission offers are subject to the provisions of Iowa Code sections 502.501, 502.501A, 502.505, 502.506, and 502.506A.

50.101(6) The administrator may, in the administrator's discretion, require proof by the offerer of compliance with this rule and the terms of the rescission offer.

50.101(7) A proposal or the making of a rescission offer shall not limit the administrator's administrative or enforcement authority provided by the Act.

This rule is intended to implement Iowa Code sections 502.509 and 502.510.

191—50.102(502) Fraudulent, deceptive or manipulative act, practice, or course of business in providing investment advice.

50.102(1) It shall constitute a fraudulent, deceptive or manipulative act, practice, or course of business for an investment adviser or an investment adviser representative acting as principal for such person's own account, knowingly to sell any security to or purchase any security from a client or, acting as broker for a person other than such client, knowingly to effect any sale or purchase of any security for the account of such client, without disclosing to such client in writing before the completion of such transaction the capacity in which the investment adviser is acting and obtaining the consent of the client to such transaction. The prohibitions of this subrule shall not apply to any transaction with a customer of a broker-dealer if such broker-dealer is not acting as an investment adviser in relation to such transaction.

50.102(2) It shall constitute a fraudulent, deceptive or manipulative act, practice, or course of business for an investment adviser or an investment adviser representative to fail to disclose to any client or prospective client all material facts regarding financial and disciplinary information as provided in 17 CFR Section 275.206(4)-4.

50.102(3) Pooled investment vehicles.

a. It shall constitute a fraudulent, deceptive, or manipulative act, practice, or course of business within the meaning of Iowa Code section 502.502(2) for any investment adviser to a pooled investment vehicle to:

(1) Make any untrue statement of a material fact or to omit to state a material fact necessary to make the statements made, in the light of the circumstances under which they were made, not misleading, to any investor or prospective investor in the pooled investment vehicle; or

(2) Otherwise engage in any act, practice, or course of business that is fraudulent, deceptive, or manipulative with respect to any investor or prospective investor in the pooled investment vehicle.

b. For purposes of this subrule, “pooled investment vehicle” means any investment company as defined in Section 3(a) of the Investment Company Act of 1940 (15 U.S.C. 80a-3(a)) or any company that would be an investment company under Section 3(a) of that Act but for the exclusion provided from that definition by either Section 3(c)(1) or Section 3(c)(7) of that Act (15 U.S.C. 80a-3(c)(1) or (7)).

This rule is intended to implement Iowa Code section 502.502(2).

191—50.103(502) Investment advisory contracts.

50.103(1) It is unlawful for any investment adviser to enter into, extend, or renew any investment advisory contract unless the contract provides in writing all of the following:

a. That the investment adviser shall not be compensated on the basis of a share of capital gains or capital appreciation of the funds or any portion of the funds of the client.

b. That no assignment of the contract may be made by the investment adviser without the consent of the other party to the contract.

c. That the investment adviser, if a partnership, shall notify the other party to the contract of any change in the membership of the partnership within a reasonable time after the change.

50.103(2) The provisions of subrule 50.103(1) shall be construed consistent with Sections 205(b) through (d) of the Investment Advisers Act of 1940, the terms of which shall be defined by Investment Advisers Act of 1940 Rules 275.205-1 and 275.205-2.

50.103(3) The provisions of subrule 50.103(1) shall not prohibit compensation on the basis of a share of capital gains or capital appreciation of the funds or any portion of the funds of the client in compliance with the exemption in 17 CFR Section 275.205-3.

This rule is intended to implement Iowa Code section 502.502(3).

191—50.104 to 50.109 Reserved.

DIVISION VIII
VIATICAL SETTLEMENT INVESTMENT CONTRACTS

191—50.110(502) Application by viatical settlement investment contract issuers and registration of agents to sell viatical settlement investment contracts.

50.110(1) Under this rule, the term “viatical settlement investment contract issuer” includes, but is not limited to, any individual, company, corporation or other entity that offers or sells, directly or indirectly, viatical settlement investment contracts to investors.

50.110(2) A viatical settlement investment contract issuer employing agents in Iowa must make prior application to the administrator for this authority. The application shall be made by letter and shall include:

a. A statement of the issuer’s intent to employ agents for the sale of its viatical settlement investment contracts; and

b. The name, address, social security number and proof of satisfaction of subrule 50.110(3) for each agent.

50.110(3) An applicant for registration as an Iowa-registered agent of an issuer of viatical settlement investment contracts shall file with the administrator:

a. Proof of obtaining a passing grade on the FINRA Series 7 examination;

b. Proof of obtaining a passing grade on the FINRA Series 63 examination;

c. An accurate, complete and signed Form U-4; and

d. A \$30 filing fee.

This rule is intended to implement Iowa Code sections 502.102(2), 502.301 and 502.402.

[ARC 9169B, IAB 10/20/10, effective 11/24/10]

191—50.111(502) Risk disclosure. Viatical settlement investment contract issuers and registered agents of issuers must provide specific, written disclosures of risk to Iowa investors at the time of the initial offer

to sell a viatical settlement investment contract. These disclosures must be preceded by the following caption, which must be in bold, 16-point typeface:

IMPORTANT RISK DISCLOSURE INFORMATION—READ BEFORE SIGNING ANY
VIATICAL SETTLEMENT INVESTMENT CONTRACT.

The disclosure must include, at a minimum, the following information:

1. That the actual annual rate of return on any viatical settlement investment contract is dependent upon an accurate projection of the viator's life expectancy and the actual date of the viator's death and that an annual "guaranteed" rate of return is not possible;
2. Whether, after purchasing the viatical settlement investment contract, the investor will be responsible for payment of premiums on the contract if the viator lives longer than projected and if the investor will be responsible for such premiums, the amount of the premium payment and any resulting negative effect on the investor's return;
3. Whether any premium payments on the contract have been escrowed and, if so, the date upon which the escrowed funds will be depleted, who is responsible for payment of premiums after depletion of the funds, and, if applicable, the amount of the premiums;
4. Whether any premium payments on the contract have been waived, whether the investor will be responsible for payment of the premiums if the insurer who wrote the policy terminates the waiver after purchase, and, if applicable, the amount of the premiums;
5. Whether the investor is responsible for payment of premiums on the contract if the viator returns to health and, if applicable, the amount of the premiums;
6. Whether the investor is entitled to all or part of the investor's investment under the contract if the viator's underlying policy is later determined to be null and void;
7. Whether the insurance policy is a group policy and, if so, the special risks associated with group policies including, but not limited to, whether the investor is responsible for payment of additional premiums if the policies are sold or converted;
8. Whether the insurance policy is term insurance and, if so, the special risks associated with term insurance including, but not limited to, whether the investor is responsible for additional premium costs if the viator continues the term policy at the end of the current term;
9. Whether the investor will be the beneficiary or owner of the insurance policy and, if the investor is the beneficiary, the special risks associated with beneficiary status;
10. Whether the insurance policy is contestable and, if so, the special risks associated with contestability including, but not limited to, the risk that the investor will have no claim or only a partial claim to death benefits should the insurer cancel the policy within the contestability period;
11. Who is making the projection of the viator's life expectancy, the information upon which the projection is based, and the relationship of the projection maker to the issuer;
12. Who is monitoring the viator's condition, how often the monitoring is done, how the date of death is determined, and how and when this information will be transmitted to the investor;
13. Whether the insurer who wrote the viator's underlying policy has any additional rights which could negatively affect or extinguish the investor's rights under the viatical settlement investment contract, what these rights are, and under what conditions these rights are activated;
14. That a viatical settlement investment contract is not a liquid investment and that there is no established secondary market for resale of these products by the investor;
15. That the investor will receive no returns (i.e., dividends and interest) until the viator dies; and
16. That the investor may lose all benefits or receive substantially reduced benefits if the insurer goes out of business during the term of the viatical investment.

This rule is intended to implement Iowa Code sections 502.102, 502.201(9E) and 502.301.

191—50.112(502) Advertising of viatical settlement investment contracts.

50.112(1) The issuer and agent shall file all viatical settlement investment contract advertisements with the administrator at least ten business days prior to the date of use or a shorter period as the administrator may permit. The administrator shall mark the advertisements with allowance for use or

expressly disapprove them during this time frame. The advertisement shall not be used in Iowa until a copy thereof, marked with allowance for use, has been received from the administrator.

50.112(2) Viatical settlement investment contract advertisements shall contain no more than the following:

- a. The name of the issuer;
- b. The address and telephone number of the issuer;
- c. A brief description of the security, including minimum purchase requirements and liquidity aspects;
- d. If a rate of return is advertised, it must be stated as the annual average rate of return, with a disclaimer that this is an annual average rate of return, that individual investor rates of return will vary based upon the viator's projected and actual date of death, and that an annual rate of return on a viatical settlement investment contract cannot be guaranteed;
- e. The name, address and telephone number of the agent of the issuer authorized to sell the viatical settlement investment contracts;
- f. A statement that the advertisement is neither an offer to sell nor a solicitation of an offer to purchase and that any offer or solicitation may only be made by providing a disclosure document; and
- g. How a copy of the disclosure document may be obtained.

50.112(3) Notwithstanding the provisions of rule 191—50.69(502), certain viatical settlement investment contract advertisements may be deemed false and misleading on their face by the administrator and are prohibited pursuant to Iowa Code sections 502.501 and 502.504. False and misleading viatical settlement investment contract advertisements include, but are not limited to, the following representations:

- a. “Fully secured,” “100% secured,” “fully insured,” “secure,” “safe,” “backed by rated insurance company(ies),” “backed by federal law,” “backed by state law,” or similar representations;
- b. “No risk,” “minimal risk,” “low risk,” “no speculation,” “no fluctuation,” or similar representations;
- c. “Qualified or approved for IRA, Roth IRA, 401K, SEP, 403B, Keogh plans, TSA, other retirement account rollovers,” “tax deferred,” or similar representations;
- d. “Guaranteed fixed return,” “guaranteed annual return,” “guaranteed principal,” “guaranteed earnings,” “guaranteed profits,” “guaranteed investment,” or similar representations;
- e. “No sales charges or fees” or similar representations;
- f. “High yield,” “superior return,” “excellent return,” “high return,” “quick profit,” or similar representations;
- g. “Perfect investment,” “proven investment,” or similar representations;
- h. Purported favorable representations or testimonials about the benefits of viaticals as an investment, taken out of context from newspapers, trade papers, journals, radio or television programs, or any other form of print or electronic media.

50.112(4) For purposes of this rule, the term “advertisement” includes any written, electronic or printed communication or any communication by means of recorded telephone messages or transmitted on radio, television, the Internet, or similar communications media, including filmstrips, motion pictures, and videos, published in connection with the offer or sale of a viatical settlement investment contract.

This rule is intended to implement Iowa Code sections 502.102, 502.301, and 502.504.

191—50.113(502) Duty to disclose. Issuers and agents equally share an affirmative duty to disclose all relevant and material information to prospective investors in viatical settlement investment contracts. The required disclosure is the registration statement required by Iowa Code section 502.304 which has been reviewed and made effective by the administrator.

This rule is intended to implement Iowa Code sections 502.102 and 502.201(9E).

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◇ Two or more ARCs

¹ Objection to rules 50.19 and 50.44, see IAC Supplement 3/8/76

CHAPTER 24
LOCATION AND CONSTRUCTION OF ELECTRIC POWER
GENERATING FACILITIES
[Prior to 10/8/86, Commerce Commission[250]]

199—24.1(476A) Authority, purpose, and policy.

24.1(1) Authority. The regulations contained herein are prescribed by the Iowa utilities board pursuant to authority granted the board in Iowa Code chapter 476A, relating to the location and construction of electric power generating facilities.

24.1(2) Purpose. The purpose of these regulations is to provide guidelines for proceedings for the determination whether the proposed construction of a major electric generation facility or significant alteration thereto should be issued a certificate before such construction may commence and to state the procedures for determining compliance by the applicant with permit and licensing requirements of state regulatory agencies.

24.1(3) Cooperative agreements. The board may enter into cooperative agreements pursuant to Iowa Code chapter 28E with the appropriate state agencies that will facilitate thorough review of all state issues arising in the certification process and will reduce the time and expense in determining, to the extent necessary, the environmental, economic, and social effects of the facility's construction and use. Under the auspices of these 28E agreements, the board shall delegate to the various state agencies responsibility for the issuance of permits and licenses appropriate to the authority of the agency to ensure compliance with the steps in the certification process. The board, where appropriate, may use a consolidated hearing process.

199—24.2(476A) Definitions. As used in this chapter:

"Acid Rain Program" means the sulfur dioxide and nitrogen oxides air pollution control program established pursuant to Title IV of the Clean Air Act, 42 U.S.C. Section 7401, et seq., as amended by Pub. L. 101-549, November 15, 1990.

"Act" means Iowa Code chapter 476A entitled Electric Power Generators.

"Agency" means an agency as defined in Iowa Code section 17A.2(1).

"Allowance" means an authorization, allocated by the federal Environmental Protection Agency under the Acid Rain Program, to emit up to one ton of sulfur dioxide, during or after a specified calendar year.

"Applicant" means the person or persons who make an application for a certificate for a facility or an amendment to a certificate for a facility under the Act. For projects with more than one participant, the applicant may be that person designated by and acting on behalf of the participants.

"Application" means an application for a certificate or an amendment to a certificate submitted to the board pursuant to the Act.

"Board" means the utilities board.

"Certificate" means a certificate as defined in Iowa Code section 476A.1.

"Contested case proceeding" means the contested case proceeding before the board prescribed by Iowa Code section 476A.4.

"Facility" means any electric power generating plant or combination of plants at a single site, owned by any person, with a maximum generator nameplate capacity of 25 megawatts of electricity or more and those associated transmission lines connecting the generating plant to either a power transmission system or an interconnected primary transmission system or both. This term includes any generation addition that increases the total maximum generator nameplate capacity at one site to 25 megawatts or more, but does not include those transmission lines beyond the generation station's substation.

"Interested agency" means an agency, other than a regulatory agency, which the board in its discretion determines to have a legitimate interest in the disposition of the application.

"Intervenor" means a person who received notice under 24.6(2) "b," "c," "d," "e," or "f" and has filed with the board a written notice of intervention, or a person granted permission to intervene by the board after filing a petition pursuant to rule 199—7.13(17A,476).

“*Participant*” means any person who either jointly or severally owns or operates a proposed facility or significant alteration thereto or who has contracted or intends to contract for a purchase of electricity produced by the subject facility.

“*Party*” means each person or agency named or admitted as a party, including the applicant, intervenors, and consumer advocate.

“*Person*” means individual, corporation, cooperative, government or governmental subdivision or agency, partnership, association or other legal entity.

“*Public utility*” means a public utility as defined in Iowa Code section 476.1.

“*Regulatory agency*” means a state agency which issues licenses or permits required for the construction, operation or maintenance of a facility pursuant to statutes or rules in effect on the date on which an application for a certificate is accepted by the board.

“*Significant alteration*” means:

- a. A change in the generic type of fuel used by the major electric generating facility; or
- b. Any change in the location, construction, maintenance, or operation of equipment at an existing facility that increases the maximum generator nameplate capacity of the facility by at least 10 percent and at least 25 megawatts.

“*Site*” means the land on which the generating unit of the facility, and any cooling facilities, cooling water reservoirs, security exclusion areas, and other necessary components of the facility, are proposed to be located.

“*Site impact area*” means the area within the state of Iowa within a ten-mile radius of the intersection of the transverse centerline axis and longitudinal centerline axis of the generator or all such generators where the proposed facility includes multiple generators.

“*Zoning authority*” means any city or county zoning authority in whose jurisdictional area a proposed facility site or portion thereof is located.

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.3(476A) Form of application, place of filing.

24.3(1) Form of application.

a. The application, associated documents, or other papers filed with the board in a certification proceeding shall be capable of being printed or typewritten and reproduced on sheets of 8½ inches by 11 inches (except for foldouts and special exhibits).

b. The information required by these rules shall be indexed and arranged in a sequential manner substantially similar to the outline form of the rules, with all material submitted categorized into the specific areas and sections set forth in the rules.

24.3(2) Manner and place of filing.

a. An applicant shall file the application electronically unless otherwise permitted by the board.

b. The board, through the use of its electronic filing system, shall include on the service list for the application each regulatory agency listed on the application in addition to other agencies as the board deems appropriate.

c. Any amendments to the application shall be filed in a manner similar to that required of the application.

[Editorial change: IAC Supplement 12/29/10; ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.4(476A) Application for a certificate—contents. Each person or group of persons proposing to construct a facility or a significant alteration to a facility shall file an application for certificate with the board, unless otherwise provided by these rules. The applicant may file a portion of an application and, in conjunction therewith, a request that the board accept such portion of the application pursuant to subrule 24.5(3) and conduct a separate phase of the proceeding with respect to issues presented by such portion of the application to the extent permitted pursuant to 24.5(3) and rule 199—24.9(476A). An application shall substantially comply with the following informational requirements:

24.4(1) In section 1, entitled “General Information,” applicant shall include the following information:

a. The legal name, address, telephone number, facsimile transmission number, and email address of the applicant and all other participants of the proposed facility at the time of filing, as well as the name of the person authorized to receive communications relating to the application on behalf of those persons, Iowa business address, if applicable, and principal place of business of the applicant.

b. The name and type of business of the applicant's and all other participants' parent companies and affiliates. The information must include percentages of ownership.

c. A complete description of the current and proposed rights of ownership in the proposed facility and current or planned purchase power contracts with respect to the proposed facility.

d. A general site description including a legal description of the site location, a map showing the coordinates of the site and its location with respect to state, county, and other political subdivisions, and prominent features such as cities, lakes, rivers and parks within the site impact area. Applicant shall also provide a more detailed map showing the location of the facility perimeter, utility property, railroads and other transportation facilities, abutting and adjacent properties, cities, lakes, rivers, parks, other public facilities, cemeteries and places of historical significance within one mile of the site boundary. The general site description should include a discussion of whether the proposed site is located in a flood plain.

e. A general description of the proposed facility including a description of the principal characteristics of the facility such as the capacity of the proposed facility in megawatts expressed by the contracted maximum generator nameplate MW rating, the net facility addition in MW, by net to the busbar rating, and the portion (in MW) of the design capacity of the proposed facility which is proposed to be available for use by each participant, the number and type of generating units, primary fuel source for each such unit, total hours of operation anticipated seasonally and annually, and output in MWH during these hours, expected capacity factors, a description of the general arrangement of major structures and equipment to provide the board with an understanding of the general layout of the facility, and a schedule for the facility's construction and utilization including the projected date significant site alteration is proposed to begin and the projected date the facility is to be placed into service. For this purpose, a group of several similar generating units operated together at the same location such that segregated records of energy output are not available shall be considered as a single unit.

f. A general description of all raw materials, including fuel, used by the proposed facility in producing electricity and of all wastes created in the production process. In addition to describing the wastes created in the production process, the applicant shall determine annual expected sulfur dioxide emissions from the facility and provide a plan for acquiring allowances sufficient to offset these emissions. The applicant shall describe all transportation facilities currently operating that will be available to serve the proposed facility and shall describe any additional transportation facilities needed to deliver raw materials and to remove wastes.

g. Identification, general description and chronology of all financial and other contractual commitments undertaken or planned to be undertaken with respect to the proposed facility.

h. A general map and description of the primary transmission corridors and the approximate routing of the rights-of-way. An analysis of the existing transmission network's capability to reliably support the proposed additional generation interconnection to the network. The analysis must also show that the interconnection to the transmission system is consistent with standard utility practices and the proposed interconnection does not degrade the adequacy, reliability, or operating flexibility of the existing transmission system in the area. A system impact analysis performed by the operator of the transmission system with which the facility will be interconnected, as well as any analysis, in applicant's possession, submitted to an area reliability council, concerning the impact of the facility on the area grid, shall satisfy the foregoing requirements. The impact analysis must include both local area and regional impacts.

i. The applicant, if a public utility, must include a statement of total cost to construct the proposed facility. Such cost shall include, but shall not be limited to, the cost of all electric power generating units, all electric supply lines within the facility site boundary, all electric supply lines beyond the facility site boundary with voltage of 69 kilovolts or higher used for transmitting power from the facility to the point of junction with the distribution system or with the interconnected primary transmission system,

all appurtenant or miscellaneous structures used and useful in connection with said facility or any part thereof, and all rights-of-way, lands or interest in lands, the use and occupancy of which are necessary or appropriate in the maintenance or operation of said facility.

j. The names and addresses of those owners and lessees of record of real property identified in 24.6(2) “*d*” and “*e*.”

k. The names and addresses of those owners and lessees of record of real property for whom the applicant seeks the use of eminent domain.

24.4(2) In section 2, entitled “Regulatory requirements,” applicant shall include the following:

a. All information related to the regulatory agency and zoning authority requirements for permits or licenses necessary to construct, operate, and maintain the facility.

b. A listing of every state agency from which any approval or authorization concerning the proposed facility is required and a listing of zoning authorities.

c. Information equivalent to the information required in the rules and application forms of such state regulatory agencies and zoning authorities, to the extent such information is ready to be filed.

24.4(3) In section 3, entitled “Community impact,” the applicant shall include an identification and analysis of the effects the construction, operation and maintenance of the proposed facility will have on the site impact area including, but not limited to, the following:

a. A forecast of the permanent impact of the construction, operation, and maintenance of the proposed facility on commercial and industrial sectors, housing, land values, labor market, health facilities, sewage and water, fire and public protection, recreational facilities, schools and transportation facilities.

b. A forecast of any temporary impact placed upon housing, schools or other community facilities as a result of a temporary influx of workers during the construction of the proposed facility.

c. A forecast of the impact of the proposed facility on property taxes of affected taxing jurisdictions. The forecast shall include the effects on property taxes caused by all community development proximately related to the construction of the proposed facility.

d. A forecast of the impact on agricultural production and uses.

e. A forecast of the impact on open space areas and areas of significant wildlife habitat. Such forecast shall include identification and description of the impact of the proposed facility on terrestrial and aquatic plants and animals.

f. A forecast of the impact on transportation facilities.

g. A forecast of the impact on cultural resources including known archaeological, historical and architectural properties, which are on, or eligible for, the National Register of Historic Places.

h. A forecast of the impact on landmarks of historic, religious, archaeological, scenic, natural or other cultural significance. Such information shall include applicant’s plans to coordinate with the office of state archaeologist to reduce or obviate any adverse impact and the applicant’s plans to coordinate with the state office of disaster services in the event of accidental release of contaminants from the proposed facility.

24.4(4) Site selection methodology. In section 4, entitled “Site selection methodology,” applicant shall present information related to its selection of the proposed site for the facility. Such information shall include the following:

a. The general criteria used to select alternative sites and how these criteria were used to select the proposed site.

b. A discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site, alternative generation method or alternative waste handling method.

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.5(476A) Initial board review: Application acceptance.

24.5(1) Upon the filing of the application or a portion of the application, the board and the appropriate regulatory agencies shall make an initial review thereof to determine if it is in substantial compliance with the requirements of rule 199—24.4(476A) which pertain thereto. If any significant deficiencies, including those noted by applicant, are determined to exist in the application, or such portion of the

application by either the board or regulatory agency, the board shall notify the applicant specifying such deficiencies, within 45 days from the date of the filing of the application or such portion of the application.

24.5(2) The applicant shall have 30 days from notification of deficiencies to amend or request, for good cause, a reasonable extension of time to amend. In the event the applicant fails to amend within the time allowed or, after amendment, the application or portion thereof filed is not in substantial compliance with the requirements of rule 199—24.4(476A) which pertain thereto, the board may reject the application or such portion thereof. Such rejection shall constitute final agency action, but shall not preclude reapplication.

24.5(3) If the application or portion thereof, after amendment or otherwise, is in substantial compliance with the requirements of rule 199—24.4(476A) which pertain thereto, the board shall, within 45 days of the filing of the application or portion thereof or amendment thereto, accept the application or portion thereof and set the time and place for hearing as provided in rule 199—24.6(476A); provided, however, that upon acceptance of a partial application, the board may order separate proceedings on particular phases of the application, pursuant to rule 199—24.9(476A), where such partial application permits a finding to be made with regard to any of the facility siting criteria contained in subrule 24.10(2).

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.6(476A) Procedural schedule.

24.6(1) Upon acceptance of the application, the board shall establish a schedule for the certification proceeding which shall include:

a. A hearing to be commenced in accordance with rule 199—24.8(476A), no earlier than 90 days nor later than 150 days from the date of acceptance. This hearing shall be conducted in the county in which the construction of the greater portion of the facility is being proposed.

b. Provision for the publication of notice of the schedule for the hearing held by the board in the form provided in Iowa Code section 17A.12(2), which notice shall be published in a newspaper of general circulation in each county in which the proposed site is located once each week for two consecutive weeks with the second publication being no later than 30 days after acceptance of the application.

24.6(2) The board shall serve notice of the acceptance of the application and proceeding schedule upon the following:

a. All regulatory agencies, including Iowa department of transportation and the Iowa department of natural resources.

b. Interested agencies as determined by the board, including the office of state archaeologist and the office of historical preservation of the state historical society of Iowa.

c. County and city zoning authorities from the area in which the proposed site is located; and

d. All owners of record of real property located within one mile of the intersection of the transverse center-line axis and longitudinal center-line axis of the generator, or all such generator axis intersections where the proposed facility includes multiple generators, and all owners of record of real property located within 1000 linear feet of the proposed boundary, but outside any such one-mile radius.

e. All lessees of record of real property of one acre or more located within the site boundary or within 1000 linear feet outside of the proposed site boundary.

f. Owners and lessees of real property for which the applicant seeks the power of eminent domain.

g. Other interested persons as determined by the board.

24.6(3) Status of notice recipient.

a. Those receiving notice under 24.6(2) “*a*” shall be deemed parties to the proceeding.

b. Such notice provided under 24.6(2) “*b*,” “*c*,” “*d*,” “*e*” or “*f*” shall state that the recipient shall have the right to become an intervenor upon duly filing written notice of intervention.

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.7(476A) Informational meeting.

24.7(1) *Place of meeting.* Not less than 30 days prior to the filing of an application the applicant shall hold an informational meeting in the county of the proposed site for the facility. In the event the

proposed site is in more than one county, such meeting shall be in that county containing the greatest portion of the proposed facility site.

24.7(2) Meeting facilities. The applicant shall be responsible for all negotiations and compensation for a suitable facility to be used for the informational meeting, including but not limited to a building or facility which is in substantial compliance with the requirements of the Americans with Disabilities Act Accessibility Guidelines, Chapter 4, where such a building or facility is reasonably available.

24.7(3) Location. The location of the meeting shall be reasonably accessible to all persons which may be affected by the granting of the certificate.

24.7(4) Board approval. Board approval shall be obtained for the proposed informational meeting date, time, and location.

24.7(5) Personnel. The prospective applicant shall provide qualified personnel to speak for the applicant in matters relating to the following:

- a. Utility planning which has resulted in the proposed construction.
- b. When the facility or significant alteration will be constructed.
- c. In general terms the physical construction, appearance and location of major structures with respect to proposed property lines.
- d. In general terms the property rights which the applicant shall seek including purchase, option to buy, and easement.
- e. Procedures to be followed in contacting affected parties for specific negotiations in acquiring property rights.
- f. Methods and factors used in arriving at offered compensation.
- g. Manner in which payments are made including discussion of conditional easements, signing fees and time of payment.
- h. Other factors or damages for which compensation is made.
- i. If the undertaking is a joint effort, other participants shall be represented at the informational meeting by qualified personnel designated to speak for them.

24.7(6) Conduct of the meeting. A member of the board, or a hearing examiner designated by the board, shall serve as the presiding officer at the meeting and present an agenda for such meeting, which shall include a summary of the legal rights of affected legal landowners. No formal record of the meeting is required. The meeting shall be considered an opportunity for interested members of the public to raise questions regarding the proposal, and an opportunity for the applicant to respond.

24.7(7) Notice. At least one week prior to the time set for the informational meeting, the applicant shall cause to be published a notice of such meeting in a newspaper of general circulation in each county containing a portion of the proposed site impact area. The notice of the informational meeting shall contain the following statement: Persons with disabilities requiring assistive services or devices to observe or participate should contact the utilities board at (515)725-7300 in advance of the scheduled date to request that appropriate arrangements be made. Proof of such notice shall be provided to the board by applicant. Additional notice shall be made through press release to all newspapers of general circulation in each county containing a portion of the proposed site impact area and, as deemed appropriate by the board, electronic media.

This rule is intended to implement Iowa Code sections 476A.2 and 476A.12.
[Editorial change: IAC Supplement 12/29/10]

199—24.8(476A) Hearing procedure.

24.8(1) General. The proceedings conducted by the board pursuant to this chapter shall be treated in the same manner as a contested case pursuant to the provisions of Iowa Code chapter 17A. Except where contrary to express provisions below, the hearing procedure shall conform to the board's rules of practice and procedure, 199—Chapter 7. The proceeding for the issuance of certificate may be consolidated with the contested case proceeding for determination of applicable ratemaking principles under Iowa Code section 476.53. All filings shall be made electronically unless otherwise permitted by the board.

24.8(2) Intervention.

a. Notice of intervention. An agency not receiving notice pursuant to 24.6(2) “b” may become a party to the contested case proceeding by filing a notice of intervention. Such notice shall contain a statement of the jurisdiction or interest of the particular agency with respect to the proposed facility.

b. Petition to intervene. Any other person wishing to become a party to the contested case proceeding may request to intervene in the proceeding by petition to intervene filed at least 30 days prior to the date of the scheduled hearing, but not afterward except for good cause shown. Such application shall specify the issues in which petitioner may contest before a regulatory agency or otherwise. A petition to intervene shall substantially comply with the form prescribed in 199—subrule 2.2. All other parties to the proceeding shall have the right to resist or respond to the petition to intervene within seven days subsequent to the petitioner’s service thereof.

c. Board discretion. The board may, in its discretion, grant or deny such petition or may permit intervention by the petitioner limited to particular issues or to a particular phase or stage of the proceeding. The board shall, in exercising its discretion, consider the substantiality of the petitioner’s rights allegedly affected by the granting or denial of the application and whether granting the intervention will unduly delay the proceeding or have no probative value to the proceeding. The granting of any petition to intervene shall not have the effect of changing or enlarging the issues specified in the board’s notice of hearing or any prehearing order of the board unless the board shall, on motion, amend the same.

24.8(3) Appearance. If any regulatory agency fails to appear of record in the contested case proceeding conducted by the board, the board shall conclusively presume that the facility meets the regulatory agency’s permit and licensing requirements and the regulatory agency shall immediately issue any license or permit required for the construction, operation, or maintenance of the facility.

24.8(4) Discovery. Discovery may begin after the commencement of the contested case proceeding. It will not be grounds for objection that the information sought will be inadmissible at the hearing if the information sought appears reasonably calculated to lead to the discovery of admissible evidence.

24.8(5) Application for rehearing. All applications for rehearing will be made and processed in accordance with Iowa Code sections 17A.16(2) and 476.12. Applications for rehearing after decisions made by the board must state the specific grounds upon which the application is based and must specify such findings of fact and conclusions of law and such terms or conditions of any certificate or amendment to certificate as are claimed to be erroneous, with a brief statement of the grounds of error. An application for rehearing shall substantially comply with the form prescribed in 199—subrule 2.2.

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.9(476A) Separate hearings on separate issues.

24.9(1) By motion. The board, upon its own motion or on the motion of the applicant, may order separate phases on particular issues of the proceeding. Each phase shall be addressed to issues involved in applying one or more of the facility siting criteria set forth in subrule 24.10(2) and shall result in board findings with respect thereto.

24.9(2) By agreement. In accordance with agreements made pursuant to Iowa Code chapter 28E, with regulatory agencies, the board shall establish separate phases of the hearing process to determine whether the proposed facility will conform to the permit and licensing requirements of the regulatory agencies.

24.9(3) Procedure. Each such hearing phase shall be conducted in conformance with the requirements of rule 199—24.8(476A) or other rules of practice and procedure designated in the applicable chapter 28E agreement.

199—24.10(476A) Certification decision.

24.10(1) Issuance of decision. Upon the close of the record in the proceeding, the board shall expeditiously render a written decision with complete determinations as to the facility siting criteria or portion thereof under consideration, other necessary findings of fact or conclusions of law necessary to support the board’s decision.

24.10(2) Facility siting criteria. In rendering its certification decision, the board shall consider the following criteria:

a. Whether the service and operations resulting from the construction of the facility are consistent with the legislative intent as expressed in Iowa Code section 476.53 and the economic development policy of the state as expressed in Iowa Code Title I, Subtitle 5, and will not be detrimental to the provision of adequate and reliable electric service. Such determination shall include whether the existing transmission network has the capability to reliably support the proposed additional generation interconnection to the network.

b. Whether the construction, maintenance, and operation of the proposed facility will be consistent with reasonable land use and environmental policies, and consonant with reasonable utilization of air, land, and water resources, considering available technology and the economics of available alternatives. Such determination shall include:

(1) Whether all adverse impacts attendant the construction, maintenance and operation of the facility have been reduced to a reasonably acceptable level;

(2) Whether the proposed site represents a reasonable choice among available alternatives;

(3) Whether the proposed facility complies with applicable city, county or airport zoning requirements and, if not, whether the location of the proposed facility at the proposed site is reasonably justified from an economic, technical, and social standpoint.

c. Whether the applicant is willing to construct, maintain, and operate the facility pursuant to the provisions of the certificate and the Act.

d. Whether the proposed facility meets the permit and licensing requirements of regulatory agencies.

e. Requirement for good engineering practice. The applicant shall use the applicable provisions in the publications listed below as standards of accepted good practice unless otherwise ordered by the board:

(1) Iowa Electrical Safety Code, as defined in 199—Chapter 25.

(2) National Electrical Code, as defined in 199—Chapter 25.

(3) Power Piping-ANSI standard B31.1-2004.

24.10(3) Amendment. If the board finds that the application and record in the proceeding does not support affirmative findings with regard to these criteria, the board will, in its order, specify any deficiencies determined to exist. The applicant shall have 30 days from the notification of the deficiencies to amend or, for good cause, to request a reasonable extension of time to amend the application or to request reopening of the record to correct the deficiencies, or both.

24.10(4) Denial. In the event the applicant fails to amend in a timely fashion, or after amendment or reopening the record, or both, the board is still unable to make an affirmative finding, the board will deny the application. The applicant may request rehearing on such denial in accordance with Iowa Code sections 17A.16(2) and 476.12.

24.10(5) Application approval. If the board finds, after amendment or record reopening, or both, or otherwise, that affirmative findings are appropriate, the board shall approve the application and, in accordance with rule 199—24.12(476A), prepare a certificate for construction of the facility.

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.11(476A) Site preparation.

24.11(1) In the event no certificate has been issued after 90 days from the commencement of the hearing, the board may permit the applicant to begin work to prepare the site for construction of the facility. Any activities conducted pursuant to this rule shall have no probative value to the board's decision concerning the actual issuance of a certificate.

24.11(2) In the event the board denies an application for a certificate or an amendment to a certificate, applicants who have received permission to begin site preparation, pursuant to 24.11(1), shall restore the site, in accordance with the board order denying the application.

[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.12(476A) Issuance of a certificate.

24.12(1) General. The certificate shall authorize construction, maintenance, and operation of the facility on the site designated in the certificate according to the following:

- a. Those terms and conditions imposed by the board and stated in the certificate.
- b. Those terms and conditions in licenses and permits issued by regulatory agencies before and during the proceeding.
- c. Those terms and conditions which have been specifically recommended by regulatory agencies in the proceeding and declared by those regulatory agencies or the board as being necessary for the applicant to comply with requirements of licenses or permits then sought but not yet issued.

24.12(2) Eminent domain. The certificate shall give the applicant the power of eminent domain to the extent and under such conditions as the board approves, prescribes, and finds necessary for the public convenience, use, and necessity, proceeding in the manner of works of internal improvement under Iowa Code chapter 6B.

24.12(3) Certificate transfer. A certificate may be transferred, subject to the approval of the board, to a person who agrees to comply with the terms of the certificate including any amendments to the certificate. Certificates shall be transferable by operation of law to any receiver, trustee or similar assignee under a mortgage, deed of trust or similar instrument.

24.12(4) Application withdrawal. Pursuant to Iowa Code section 476.53, a rate-regulated utility shall have the option of withdrawing its application for issuance of a certificate.
[ARC 3751C, IAB 4/11/18, effective 5/16/18]

199—24.13(476A) Exemptions from certification application; application for amendment for certificate: Contents.

24.13(1) Application for amendment.

a. Each person or group of persons proposing a significant alteration to any facility which was constructed pursuant to a certificate issued by the board shall file an application for an amendment to a certificate in lieu of an application for a certificate.

b. Each person or group of persons proposing a significant alteration to any facility which was not constructed pursuant to a certificate issued by the board must file an application for such certificate unless:

- (1) The facility has not attained full commercial rating and has not operated in excess of 80 percent of its maximum nameplate megawatt rating for ten hours daily for 45 consecutive days; and
- (2) The significant alteration requires no more land than was required for the facility, is within the scope of publicly announced plans for the facility's construction, and entails no additional contracts for major components than those let for the facility.

24.13(2) All applications for amendment to a certificate shall be filed in accordance with rule 199—24.3(476A) and shall include:

- a. A complete identification and discussion of the nature of the amendment proposed; and
- b. A complete enumeration of the effects the amendment has on the accuracy of the information contained in the application for a certificate filed pursuant to rule 199—24.4(476A).

24.13(3) Upon board acceptance of the application in accordance with 24.13(1), the board shall establish a hearing schedule. At the board's discretion, the informational meeting and prehearing conference for this proceeding may be waived. Notice shall be in accordance with 24.6(2).

24.13(4) In the consideration of an application for a certificate, pursuant to 24.13(1) "b," or amendment to a certificate, pursuant to 24.13(1) "a," there shall be a rebuttable presumption that the decision criteria of 24.10(2) are satisfied.

24.13(5) Amendment to a certificate. In determining whether an amendment to a certificate will be issued to the applicant, the board will be guided by the criteria set forth in 24.10(2) to the extent applicable and appropriate.

This rule is intended to implement Iowa Code sections 17A.3, 474.5, 476.1, and 476.2.

199—24.14(476A) Assessment of costs. The applicant for a certificate, or an amendment to a certificate, shall pay all the costs and expenses incurred by the board in reaching a decision on the application including the costs of examinations of the site, the hearing, publishing of notice, board staff salaries, the cost of consultants employed by the board, and other expenses reasonably attributable to the proceeding.

This rule is intended to implement Iowa Code chapter 476A and sections 17A.3, 474.5, 476.1, and 476.2.

199—24.15(476A) Waiver. The board, if it determines that the public interest would not be adversely affected, may waive any of the requirements of this chapter. In determining whether the public interest would not be adversely affected, the board will consider the following factors:

1. The purpose of the facility.
2. The type of facility.
3. If the facility is for the applicant's own needs.
4. The effect of the facility on existing transmission systems.
5. Any other relevant factors.

In addition to other service requirements, the applicant must serve a copy of the waiver request on all owners of record of real property that adjoins the proposed facility site. A request for a waiver shall also comply with rule 199—1.3(17A,474,476).

This rule is intended to implement Iowa Code sections 476A.1, 476A.2, 476A.4, 476A.6, 476A.7 and 476A.15.

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CHAPTER 57
RESIDENTIAL CARE FACILITIES
[Prior to 7/15/87, Health Department[470] Ch 57]

481—57.1(135C) Definitions. The following definitions apply to this chapter and to 481—Chapter 62. The definitions set out in Iowa Code section 135C.1 shall be considered to be incorporated verbatim in these rules.

“*Accommodation*” means the provision of lodging, including sleeping, dining, and living areas.

“*Activities of daily living*” means the following self-care tasks: bathing, dressing, grooming, eating, transferring, toileting and ambulation.

“*Administrator*” means a person approved by the department who administers, manages, supervises, and is in general administrative charge of a residential care facility, whether or not such person has an ownership interest in the facility, and whether or not the functions and duties are shared with one or more other persons.

“*Ambulatory*” means the condition of a person who immediately and without the aid of another person is physically and mentally capable of traveling a normal path to safety, including the ascent and descent of stairs.

“*Basement*” means that part of a building where the finish floor is more than 30 inches below the finish grade of the building.

“*Board*” means the regular provision of meals.

“*Change of ownership*” means the purchase, transfer, assignment, or lease of a licensed residential care facility.

“*Communicable disease*” means a disease caused by the presence within a person’s body of a virus or microbial agent which may be transmitted either directly or indirectly to other persons.

“*Department*” means the department of inspections and appeals.

“*Distinct part*” means a clearly identifiable area or section containing contiguous rooms within a health care facility.

“*Interdisciplinary team*” means the group of persons who develop a single, integrated, individual program plan to meet a resident’s needs for services. The interdisciplinary team consists of, at a minimum, the resident, the resident’s legal guardian if applicable, the resident’s advocate if desired by the resident, a referral agency representative, other appropriate staff members, other providers of services, and other persons relevant to the resident’s needs.

“*Legal representative*” means the resident’s guardian or conservator if one has been appointed or the resident’s power of attorney.

“*Mechanical restraint*” means restriction by the use of a mechanical device of a resident’s mobility or ability to use the hands, arms or legs.

“*Medication*” means any drug, including over-the-counter substances, ordered and administered under the direction of the primary care provider.

“*Nonambulatory*” means the condition of a person who immediately and without the aid of another person is not physically or mentally capable of traveling a normal path to safety, including the ascent and descent of stairs.

“*Personal care*” means assistance with the activities of daily living which the recipient can perform only with difficulty. Examples are help in getting in and out of bed, assistance with personal hygiene and bathing, help with dressing and eating, and supervision over medications which can be self-administered.

“*Physical restraint*” means direct physical contact on the part of a staff person to control a resident’s physical activity for the resident’s own protection or for the protection of others.

“*Primary care provider*” means any of the following who provide primary care and meet licensure standards:

1. A physician who is a family or general practitioner or an internist.
2. An advanced registered nurse practitioner.
3. A physician assistant.

“*Program of care*” means all services being provided for a resident in a health care facility.

“*Prone restraint*” means a restraint in which a resident is in a face-down position against the floor or another surface.

“*Rate*” means the daily fee that is charged for all residents equally and that includes the cost of all minimum services required in these rules and regulations.

“*Records*” includes electronic records.

“*Responsible party*” means the person who signs or cosigns the residency agreement required in rule 481—57.15(135C) or the resident’s legal representative. In the event that a resident has neither a legal representative nor a person who signed or cosigned the resident’s residency agreement, the term “responsible party” shall include the resident’s sponsoring agency, e.g., the department of human services, the U.S. Department of Veterans Affairs, a religious group, fraternal organization, or foundation that assumes responsibility and advocates for its client patients and pays for their health care.

“*Restraints*” means the measures taken to control a resident’s physical activity for the resident’s own protection or for the protection of others.

[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 3737C, IAB 4/11/18, effective 5/16/18; ARC 3738C, IAB 4/11/18, effective 5/16/18]

481—57.2(135C,17A) Waiver or variance. A waiver or variance from these rules may be granted by the director of the department in accordance with 481—Chapter 6. A request for waiver or variance will be granted or denied by the director within 120 calendar days of receipt.

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.3(135C) Application for licensure.

57.3(1) Application and licensing—new facility or change of ownership. In order to obtain an initial residential care facility license for a facility not currently licensed as a residential care facility or for a residential care facility when a change of ownership is contemplated, the applicant must:

- a. Make application at least 30 days prior to the proposed opening date of the facility. Application shall be made on forms provided by the department.
- b. Meet all of the rules, regulations, and standards contained in 481—Chapters 50, 57 and 60. Exceptions noted in 481—subrule 60.3(2) shall not apply.
- c. Submit a letter of intent and a written résumé of care. The résumé of care shall meet the requirements of subrule 57.3(2).
- d. Submit a floor plan of each floor of the residential care facility. The floor plan of each floor shall be drawn on 8½" × 11" paper, show room areas in proportion, room dimensions, window and door locations, designation of the use of each room, and the room numbers for all rooms, including bathrooms.
- e. Submit a photograph of the front and side of the residential care facility.
- f. Submit the statutory fee for a residential care facility license.
- g. Comply with all other local statutes and ordinances in existence at the time of licensure.
- h. Submit a certificate signed by the state or local fire inspection authority as to compliance with fire safety rules and regulations.

57.3(2) Résumé of care. The résumé of care shall describe the following:

- a. Purpose of the facility;
- b. Criteria for admission to the facility;
- c. Ownership of the facility;
- d. Composition and responsibilities of the governing board;
- e. Qualifications and responsibilities of the administrator;
- f. Medical services provided to residents, to include the availability of emergency medical services in the area and the designation of a primary care provider to be responsible for residents in an emergency;
- g. Dental services provided to residents and available in the area;
- h. Nursing services provided to residents, if applicable;
- i. Personal services provided to residents, including supervision of or assistance with activities of daily living;
- j. Activity program;

- k.* Dietary services, including qualifications of the person in charge, consultation service (if applicable) and meal service;
- l.* Other services available as applicable, including social services, physical therapy, occupational therapy, and recreational therapy;
- m.* Housekeeping;
- n.* Laundry;
- o.* Physical plant; and
- p.* Staffing provided to meet residents' needs.

57.3(3) *Renewal application.* In order to obtain a renewal of the residential care facility license, the applicant must submit the following:

- a.* The completed application form 30 days prior to the annual license renewal date of the residential care facility license;
- b.* The statutory license fee for a residential care facility;
- c.* An approved current certificate signed by the state or local fire inspection authority as to compliance with fire safety rules and regulations;
- d.* Changes to the résumé of care, if any; and
- e.* Changes to the current residency agreement, if any.

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.4(135C) Issuance of license. Licenses are issued to the person, entity or governmental unit with responsibility for the operation of the facility and for compliance with all applicable statutes, rules and regulations.

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.5(135C) Licenses for distinct parts.

57.5(1) Separate licenses may be issued for distinct parts of a health care facility which are clearly identifiable, contain contiguous rooms, and provide separate categories of care and services.

57.5(2) The following requirements shall be met for separate licensing of a distinct part:

- a.* The distinct part shall serve only residents who require the category of care and services immediately available to them within that part. (III)
- b.* The distinct part shall meet all the standards, rules, and regulations pertaining to the category for which a license is being sought.
- c.* The distinct part must be operationally and financially feasible.
- d.* Personal care staff with qualifications appropriate to the care and services being rendered must be regularly assigned and working in the distinct part under responsible management. (III)
- e.* Separately licensed distinct parts may have certain services such as management, building maintenance, laundry and dietary in common with each other.

This rule is intended to implement Iowa Code sections 135C.6(2) and 135C.14.

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.6(135C) Special classifications.

57.6(1) *Memory care.*

a. Designation and application. A residential care facility may choose to care for residents who require memory care in a distinct part of the facility or designate the entire residential care facility as one that provides memory care. Residents in the memory care unit or facility shall meet the level of care requirements for a residential care facility. "Memory care" in a residential care facility means the care of persons with early Alzheimer's-type dementia or other disorders causing dementia. (I, II, III)

(1) Application for approval to provide this category of care shall be submitted by the licensee on a form provided by the department. (III)

(2) Plans to modify the physical environment shall be submitted to the department for review based on the requirements of 481—Chapter 60. (III)

(3) If the unit or facility is to be a locked unit or facility, all locking devices shall meet the Life Safety Code and any requirements of the state fire marshal. If the unit or facility is to be unlocked, a system of security monitoring is required. (I, II, III)

b. Résumé of care. A résumé of care shall be submitted to the department for approval at least 30 days before a separate memory care unit or facility is opened. For facilities with a memory care unit, this résumé of care is in addition to the résumé of care required by subrule 57.3(2). A new résumé of care shall be submitted when services are substantially changed. The résumé of care shall:

- (1) Describe the population to be served;
- (2) State the philosophy and objectives;
- (3) List criteria for transfer to and from the memory care unit or facility;
- (4) Include a copy of the floor plan;
- (5) List the titles of policies and procedures developed for the unit or facility;
- (6) Propose a staffing pattern;
- (7) Set out a plan for specialized staff training;
- (8) State visitor, volunteer, and safety policies;
- (9) Describe programs for activities, social services and families; and
- (10) Describe the interdisciplinary team and the role of each team member.

c. Policies and procedures. Separate written policies and procedures shall be implemented in the memory care unit or facility and shall address the following:

(1) Criteria for admission and the preadmission evaluation process. The policy shall require a statement from the primary care provider approving the placement before a resident may be moved into a memory care unit or facility. (II, III)

(2) Safety, including a description of the actions required of staff in the event of a fire, natural disaster, emergency medical event or catastrophic event. Safety procedures shall also explain steps to be taken when a resident is discovered to be missing from the unit or facility and when hazardous cleaning materials or potentially dangerous mechanical equipment is being used in the unit or facility and explain the manner in which the effectiveness of the security system will be monitored. (II, III)

(3) Staffing requirements, including the minimum number, types and qualifications of staff in the unit or facility in accordance with resident needs. (II, III)

(4) Visitation policies, including suggested times for visitation and ensuring the residents' rights to free access to visitors unless visits are contraindicated by the interdisciplinary team. (II, III)

(5) The process and criteria which will be used to monitor and to respond to risks specific to the residents, including but not limited to drug use, restraint use, infections, incidents and acute behavioral events. (II, III)

d. Assessment prior to transfer or admission. Prior to the transfer or admission of a resident applicant to the memory care unit or facility, a complete assessment of the resident applicant's physical, mental, social and behavioral status shall be completed to determine whether the applicant meets admission criteria. This assessment shall be completed by facility staff and shall become part of the resident's permanent record upon admission. (II, III)

e. Staff training. All staff working in a memory care unit or facility shall have training appropriate to the needs of the residents. (I, II, III)

(1) Upon assignment to the unit or facility, all staff working in the unit or facility shall be oriented to the needs of residents requiring memory care. Staff members shall have at least six hours of special training appropriate to their job descriptions within 30 days of assignment to the unit or facility. (I, II, III)

(2) Training shall include the following topics: (II, III)

1. An explanation of Alzheimer's disease and related disorders, including symptoms, behavior and disease progression;
2. Skills for communicating with persons with dementia;
3. Skills for communicating with family and friends of persons with dementia;
4. An explanation of family issues such as role reversal, grief and loss, guilt, relinquishing the caregiving role, and family dynamics;

5. The importance of planned and spontaneous activities;
6. Skills in providing assistance with activities of daily living;
7. Skills in working with challenging residents;
8. Techniques for cueing, simplifying, and redirecting;
9. Staff support and stress reduction;
10. Medication management and nonpharmacological interventions.

(3) Nursing staff, certified medication aides, medication managers, social services personnel, housekeeping and activity personnel shall have a minimum of six hours of in-service training annually. This training shall be related to the needs of memory care residents. The six-hour initial training required in subparagraph 57.6(1) “e”(1) shall count toward the required annual in-service training. (II, III)

f. Staffing. There shall be at least one staff person on a memory care unit at all times. (I, II, III)

g. Others living in the memory care unit. A resident not requiring memory care services may live in the memory care unit if the resident’s spouse requiring memory care services lives in the unit or if no other beds are available in the facility and the resident or the resident’s legal representative consents in writing to the placement. (II, III)

h. Revocation, suspension or denial. The memory care unit license or facility license may be revoked, suspended or denied pursuant to Iowa Code chapter 135C and 481—Chapter 50.

57.6(2) Residential care facility for persons with an intellectual disability (RCF/ID).

a. Definition. For purposes of this rule, the following term shall have the meaning indicated.

“*Qualified intellectual disability professional*” means a psychologist, physician, registered nurse, educator, social worker, physical or occupational therapist, speech therapist or audiologist who meets the educational requirements for the profession, as required in the state of Iowa, and has one year’s experience working with persons with an intellectual disability.

b. Designation and application. A residential care facility may choose to care for persons with an intellectual disability in a distinct part of the facility or designate the entire residential care facility as a residential care facility for persons with an intellectual disability. Residents shall meet the level of care requirements for a residential care facility. (I, II, III)

(1) Application for approval to provide this category of care shall be submitted by the licensee on a form provided by the department. (III)

(2) Plans to modify the physical environment shall be submitted to the department for review based on the requirements of 481—Chapter 60. (III)

c. Résumé of care. A résumé of care shall be submitted to the department for approval at least 30 days before a residential care facility for persons with an intellectual disability is opened. A new résumé of care shall be submitted when services are substantially changed. The résumé of care shall:

- (1) Describe the population to be served;
- (2) Include a copy of the floor plan;
- (3) List the titles of policies and procedures developed for the unit or facility;
- (4) Set out a plan for specialized staff training;
- (5) State visitor, volunteer, and safety policies;
- (6) Describe programs for activities, social services and families; and
- (7) Describe the interdisciplinary team and the role of each team member.

d. Policies and procedures. Separate written policies and procedures shall be implemented in the residential care facility for persons with an intellectual disability and shall address the following:

(1) Criteria for admission and the preadmission evaluation process. The policy shall require a statement from the primary care provider approving the placement before a resident may be moved into a residential care facility for persons with an intellectual disability. The policy shall require a primary diagnosis of an intellectual disability for admission. (II, III)

(2) Safety, including a description of the actions required of staff in the event of a fire, natural disaster, emergency medical event or catastrophic event. (II, III)

(3) Staffing requirements, including the minimum number, types and qualifications of staff in the facility in accordance with resident needs. (II, III)

(4) Visitation policies, including suggested times for visitation and ensuring the residents' rights to free access to visitors unless visits are contraindicated by the interdisciplinary team. (II, III)

(5) The process and criteria which will be used to monitor and to respond to risks specific to the residents, including but not limited to drug use, restraint use, infections, incidents and acute behavioral events. (II, III)

e. Assessment prior to transfer or admission. Prior to the transfer or admission of a resident applicant to the facility, a complete assessment of the resident applicant's physical, mental, social and behavioral status shall be completed to determine whether the applicant meets admission criteria. This assessment shall be completed by facility staff and shall become part of the resident's permanent record upon admission. (II, III)

f. Administrator qualifications. In addition to meeting the requirements of subrule 57.10(1), the administrator of a residential care facility for persons with an intellectual disability shall have at least one year's documented experience in direct care or supervision of persons with an intellectual disability. An individual employed as an administrator on May 16, 2018, will be deemed to meet the requirements of this subrule.

g. In-service educational programming. The in-service educational programming required by paragraph 57.10(2)"c" shall include educational programming specific to serving persons with an intellectual disability.

h. Revocation, suspension or denial. The facility license may be revoked, suspended or denied pursuant to Iowa Code chapter 135C and 481—Chapter 50.

This rule is intended to implement Iowa Code sections 135C.2(3)"b" and 135C.14.
[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 3737C, IAB 4/11/18, effective 5/16/18]

481—57.7(135C) General requirements.

57.7(1) The license shall be displayed in the facility in a conspicuous place which is accessible to the public. (III)

57.7(2) The license shall be valid only in the possession of the licensee to whom it is issued.

57.7(3) The posted license shall accurately reflect the current status of the residential care facility. (III)

57.7(4) The license shall expire one year after the date of issuance or as indicated on the license.

57.7(5) The licensee shall:

a. Assume the responsibility for the overall operation of the residential care facility. (I, II, III)

b. Be responsible for compliance with all applicable laws and with the rules of the department. (I, II, III)

c. Provide an organized continuous 24-hour program of care commensurate with the needs of the residents. (I, II, III)

57.7(6) Each citation or a copy of each citation issued by the department for a class I or class II violation shall be prominently posted by the facility in plain view of the residents, visitors, and persons inquiring about placement in the facility. The citation or copy of the citation shall remain posted until the violation is corrected to the satisfaction of the department. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.8(135C) Certified volunteer long-term care ombudsman program. A certified volunteer long-term care ombudsman appointed in accordance with Iowa Code section 231.45 shall operate within the scope of the rules for volunteer ombudsmen promulgated by the office of the long-term care ombudsman and the Iowa department on aging.

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.9(135C) Required notifications to the department. The department shall be notified:

57.9(1) Thirty days before any proposed change in the residential care facility's functional operation or addition or deletion of required services; (III)

57.9(2) Thirty days before the beginning of the renovation, addition, functional alteration, change of space utilization, or conversion in the residential care facility or on the premises; (III)

57.9(3) Thirty days before closure of the residential care facility; (III)

57.9(4) Within two weeks of any change in administrator; (III)

57.9(5) Ninety days before a change in the category of license; (III)

57.9(6) Thirty days before a change of ownership, the licensee shall:

a. Inform the department of the pending change of ownership; (III)

b. Inform the department of the name and address of the prospective purchaser, transferee, assignee, or lessee; (III)

c. Submit a written authorization to the department permitting the department to release all information of whatever kind from the department's files concerning the licensee's residential care facility to the named prospective purchaser, transferee, assignee, or lessee. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.10(135C) Administrator. Each residential care facility shall have one person in charge, duly approved by the department or acting in a provisional capacity in accordance with these rules. (III)

57.10(1) Qualifications of an administrator.

a. The administrator shall be at least 21 years of age and shall have a high school diploma or equivalent. (III) In addition, this person shall meet at least one of the following conditions:

(1) Have a two-year degree in human services, psychology, sociology, nursing, health care administration, public administration, or a related field and have a minimum of two years' experience in the field; or (III)

(2) Have a four-year degree in human services, psychology, sociology, nursing, health care administration, public administration, or a related field and have a minimum of one year experience in the field; or (III)

(3) Have a master's degree in human services, psychology, sociology, nursing, health care administration, public administration, or a related field and have a minimum of one year experience in the field; or (III)

(4) Be a licensed nursing home administrator; or (III)

(5) Have completed a one-year educational training program approved by the department for residential care facility administrators; or (III)

(6) Have passed the National Association of Long Term Care Administrator Boards (NAB) RC/AL administrator licensure examination; or

(7) Have two years of direct care experience and at least six months of administrative experience in a residential care facility. (III)

b. An individual employed as an administrator on January 14, 2015, will be deemed to meet the requirements of this subrule.

57.10(2) Duties of an administrator. The administrator shall:

a. Select and direct competent personnel who provide services for the residential care program. (III)

b. Arrange for the heads of nursing, social services, dietary and activities to attend a minimum of ten contact hours of educational programs per year to increase skills and knowledge needed for their positions. The ten hours is in addition to the in-service requirements in paragraph 57.10(2) "c." (III)

c. Provide in-service educational programming for all employees with direct resident contact and maintain records of programs and participants. (III) In-service educational programming offered during each calendar year shall include, at minimum, the following topics: (I, II, III)

(1) Infection control.

(2) Emergency preparedness (fire, tornado, flood, 911, etc.).

(3) Meal time procedures/dietary.

(4) Resident activities.

(5) Mental illness/behavior modification/crisis intervention.

(6) Resident safety/supervision.

(7) Resident rights.

(8) Medication education, to include administration, storage and drug interactions.

(9) Resident service plans/programming/goals.

57.10(3) Administrator serving at more than one residential care facility. The administrator may be responsible for no more than 150 beds in total if the administrator is an administrator of more than one facility. (II)

a. An administrator of more than one facility shall designate in writing an administrative staff person in each facility who shall be responsible for directing programs in the facility.

b. The administrative staff person designated by the administrator shall:

(1) Have at least one year of experience in a supervisory or direct care position in a residential care facility or in a facility for the intellectually disabled, mentally ill or developmentally disabled; (II, III)

(2) Be knowledgeable of the operation of the facility; (II, III)

(3) Have access to records concerned with the operation of the facility; (II, III)

(4) Be capable of carrying out administrative duties and of assuming administrative responsibilities; (II, III)

(5) Be at least 21 years of age; (III)

(6) Be empowered to act on behalf of the licensee concerning the health, safety and welfare of the residents; and (II, III)

(7) Have training in emergency response, including how to respond to residents' sudden illnesses. (II, III)

c. If an administrator serves more than one facility, the administrator must designate in writing regular and specific times during which the administrator will be available to consult with staff and residents to provide direction and supervision of resident care and services. (II, III)

57.10(4) Provisional administrator. A provisional administrator may be appointed on a temporary basis by the residential care facility licensee to assume the administrative responsibilities for a residential care facility for a period not to exceed one year when the facility has lost its administrator and has not been able to replace the administrator, provided that the department has been notified and approved the provisional administrator prior to the date of the provisional administrator's appointment. (III) The provisional administrator must meet the requirements of paragraph 57.10(3) "b."

57.10(5) Temporary absence of administrator.

a. In the temporary absence of the administrator, a responsible person shall be designated in writing to the department to be in charge of the facility. (III) The person designated shall:

(1) Be knowledgeable of the operation of the facility; (III)

(2) Have access to records concerned with the operation of the facility; (III)

(3) Be capable of carrying out administrative duties and of assuming administrative responsibilities; (III)

(4) Be at least 21 years of age; (III)

(5) Be empowered to act on behalf of the licensee during the administrator's absence concerning the health, safety, and welfare of the residents; (III)

(6) Have training in emergency response, including how to respond to residents' sudden illnesses. (II, III)

b. If the administrator is absent for more than six weeks, a provisional administrator must be appointed pursuant to subrule 57.10(4).

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.11(135C) Personnel.

57.11(1) Alcohol and drug use prohibited. No person under the influence of intoxicating drugs or alcoholic beverages shall be permitted to provide services in a residential care facility. (I, II)

57.11(2) Job description. There shall be a written job description developed for each category of worker. The job description shall include the job title, responsibilities and qualifications. (III)

57.11(3) Employee criminal record checks, child abuse checks and dependent adult abuse checks and employment of individuals who have committed a crime or have a founded abuse. The facility shall comply with the requirements found in Iowa Code section 135C.33 as amended by 2014 Iowa Acts, chapter 1040, and rule 481—50.9(135C) related to completion of criminal record checks, child abuse

checks, and dependent adult abuse checks and to employment of individuals who have committed a crime or have a founded abuse. (I, II, III)

57.11(4) *Personnel record.* A personnel record shall be kept for each employee and shall include but not be limited to the following information about the employee: name and address, social security number, date of birth, date of employment, position, experience and education, references, results of criminal record checks, child abuse checks and dependent adult abuse checks, and date of discharge or resignation. (III)

57.11(5) *Supervision and staffing.*

- a. The facility shall provide sufficient staff to meet the needs of the residents served. (I, II, III)
- b. Personnel in a residential care facility shall provide 24-hour coverage for residential care services. Personnel shall be awake at all times while on duty. (I, II, III)
- c. Direct care staff shall be present in the facility unless all residents are involved in activities away from the facility. (I, II, III)
- d. Staff shall be aware of and provide supervision levels based on the present needs of the residents in the staff's care. The facility shall document the supervision of residents who require more than general supervision, as defined by facility policy. (I, II, III)

e. The facility shall maintain an accurate record of actual hours worked by employees. (III)

57.11(6) *Physical examination and screening.* Employees shall have a physical examination no longer than 12 months prior to beginning employment and every four years thereafter. Screening and testing for tuberculosis shall be conducted pursuant to 481—Chapter 59. (I, II, III)

57.11(7) *Orders for medications and treatments.* Orders for medications and treatments shall be correctly implemented by qualified personnel. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 2273C, IAB 12/9/15, effective 1/13/16]

481—57.12(135C) *General policies.* The licensee shall establish and implement written policies and procedures as set forth in this rule. The policies and procedures shall be available for review by the department, other agencies designated by Iowa Code section 135C.16(3), staff, residents, residents' families or legal representatives, and the public and shall be reviewed by the licensee annually. (II)

57.12(1) *Facility operation.* The licensee shall establish written policies for the operation of the facility, including, but not limited to the following: (III)

- a. Personnel; (III)
- b. Admission; (III)
- c. Evaluation services; (II, III)
- d. Programming and individual program plans; (II, III)
- e. Registered sex offender management; (II, III)
- f. Crisis intervention; (II, III)
- g. Discharge or transfer; (III)
- h. Medication management, including self-administration of medications and chemical restraints; (III)
- i. Resident property; (II, III)
- j. Resident finances; (II, III)
- k. Records; (III)
- l. Health and safety; (II, III)
- m. Nutrition; (III)
- n. Physical facilities and maintenance; (III)
- o. Resident rights; (II, III)
- p. Investigation and reporting of alleged dependent adult abuse; (II, III)
- q. Investigation and reporting of accidents or incidents; (II, III)
- r. Transportation of residents; (II, III)
- s. Resident supervision; (II, III)
- t. Smoking; (III)
- u. Visitors; (III)

- v. Disaster/emergency planning; (III) and
- w. Infection control. (III)

57.12(2) *Personnel policies.* Written personnel policies shall include the hours of work and attendance at educational programs. (III)

57.12(3) *Infection control.* The facility shall have a written and implemented infection control program, which shall include policies and procedures based on guidelines issued by the Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. The infection control program shall address the following:

- a. Techniques for hand washing; (I, II, III)
- b. Techniques for handling of blood, body fluids, and body wastes; (I, II, III)
- c. Dressings, soaks or packs; (I, II, III)
- d. Infection identification; (I, II, III)
- e. Resident care procedures to be used when there is an infection present; (I, II, III)
- f. Sanitation techniques for resident care equipment; (I, II, III)
- g. Techniques for sanitary use and reuse of feeding syringes and single-resident use and reuse of urine collection bags; (I, II, III) and
- h. Techniques for use and disposal of needles, syringes, and other sharp instruments. (I, II, III)

57.12(4) *Resident care techniques.* The facility shall have written and implemented procedures to be followed if a resident needs any of the following treatment or devices:

- a. Intravenous or central line catheter; (I, II, III)
- b. Urinary catheter; (I, II, III)
- c. Respiratory suction, oxygen or humidification; (I, II, III)
- d. Decubitus care; (I, II, III)
- e. Tracheostomy; (I, II, III)
- f. Nasogastric or gastrostomy tubes; (I, II, III)
- g. Sanitary use and reuse of feeding syringes and single-resident use and reuse of urine collection bags. (I, II, III)

57.12(5) *Emergency care.* The facility shall establish written policies for the provision of emergency medical care to residents and employees in case of sudden illness or accident. The policies shall include a list of those individuals to be contacted in case of an emergency. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.13(135C) Admission, transfer and discharge.

57.13(1) *General admission policies.*

- a. Residents shall be admitted to a residential care facility only on a written order signed by a primary care provider, specifying the level of care, and certifying that the individual being admitted requires no more than personal care and supervision and does not require routine nursing care. (II, III)
- b. No residential care facility shall admit or retain a resident who is in need of greater services than the facility can provide. (I, II, III)
- c. No residential care facility shall admit more residents than the number of beds for which the facility is licensed. (II, III)
- d. A residential care facility is not required to admit an individual through court order, referral or other means without the express prior approval of the administrator. (III)
- e. The admission of a resident shall not grant the residential care facility the authority or responsibility to manage the personal affairs of the resident except as may be necessary for the safety of the resident and the safe and orderly management of the residential care facility as required by these rules. (III)
- f. Individuals under the age of 18 shall not be admitted to a residential care facility without prior written approval by the department. A distinct part of a residential care facility, segregated from the adult section, may be established based on a résumé of care that is submitted by the licensee or applicant and is commensurate with the needs of the residents of the residential care facility and that has received the department's review and approval. (III)

g. No health care facility and no owner, administrator, employee or representative thereof shall act as guardian, trustee, or conservator for any resident's property unless such resident is related within the third degree of consanguinity to the person acting as guardian. (III)

57.13(2) Discharge or transfer.

a. Notification shall be made to the legal representative, primary care provider, and sponsoring agency, if any, prior to the transfer or discharge of any resident. (III)

b. The licensee shall not refuse to discharge or transfer a resident when the primary care provider, family, resident, or legal representative requests such transfer or discharge. (II, III)

c. Advance notification will be made to the receiving facility prior to the transfer of any resident. (III)

d. When a resident is transferred or discharged, the appropriate record will accompany the resident to ensure continuity of care. "Appropriate record" includes the resident's face sheet, service plan, most recent orders of the primary care provider and any notifications of upcoming scheduled appointments. (II, III)

e. When a resident is transferred or discharged, the resident's unused prescriptions shall be sent with the resident or with a legal representative only upon the written order of a primary care provider. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.14(135C) Involuntary discharge or transfer.

57.14(1) Involuntary discharge or transfer permitted. A facility may involuntarily discharge or transfer a resident for only one of the following reasons:

- a. Medical reasons;
- b. The resident's welfare or that of other residents;
- c. Repeated refusal by the resident to participate in the resident's service plan;
- d. Due to action pursuant to Iowa Code chapter 229; or
- e. Nonpayment for the resident's stay, as described in the residency agreement for the resident's stay.

57.14(2) Medical reasons. Medical reasons for transfer or discharge shall be based on the resident's needs and shall be determined and documented in the resident's record by the primary care provider. Transfer or discharge may be required in order to provide a different level of care to the resident. (II)

57.14(3) Welfare of a resident. Welfare of a resident or that of other residents refers to a resident's social, emotional, or physical well-being. A resident may be transferred or discharged because the resident's behavior poses a continuing threat to the resident (e.g., suicidal) or to the well-being of other residents or staff (e.g., the resident's behavior is incompatible with other residents' needs and rights). Written documentation that the resident's continued presence in the facility would adversely affect the resident's own welfare or that of other residents shall be made by the administrator or designee and shall include specific information to support this determination. (II)

57.14(4) Notice. Involuntary transfer or discharge of a resident from a facility shall be preceded by a written notice to the resident and the responsible party. (II, III)

a. The notice shall contain all of the following information:

- (1) The stated reason for the proposed transfer or discharge. (II)
- (2) The effective date of the proposed transfer or discharge. (II)
- (3) A statement, in not less than 12-point type, that reads as follows:

You have a right to appeal the facility's decision to transfer or discharge you. If you think you should not have to leave this facility, you may request a hearing, in writing or verbally, with the Iowa department of inspections and appeals (hereinafter referred to as "department") within seven days after receiving this notice. You have a right to be represented at the hearing by an attorney or any other individual of your choice. If you request a hearing, it will be held no later than 14 days after receipt of your request by the department and you will not be transferred prior to a final decision. In emergency circumstances, extension of the 14-day requirement may be permitted upon request to the department's designee. If you lose the hearing, you will not be transferred before the expiration of (1) 30 days following receipt of the original notice of the discharge or transfer, or (2) 5 days following final decision of such hearing, including exhaustion of all appeals, whichever occurs later. To request a hearing or receive further information, call the department at (515)281-4115, or write to the department to the attention of: Administrator, Division of Health Facilities, Department of Inspections and Appeals, Lucas State Office Building, Des Moines, Iowa 50319-0083. (II)

b. The notice shall be personally delivered to the resident and a copy placed in the resident's record. A copy shall also be transmitted to the department; the resident's responsible party; the resident's primary care provider; the person or agency responsible for the resident's placement, maintenance, and care in the facility; and the department on aging's long-term care ombudsman. The notice shall indicate that a copy has been transmitted to the required parties by using the abbreviation "cc:" and listing the names of all parties to whom copies were sent. (II)

c. The notice required by paragraph 57.14(4) "a" shall be provided at least 30 days in advance of the proposed transfer or discharge unless one of the following occurs: (II)

(1) An emergency transfer or discharge is mandated by the resident's health care needs and is in accordance with the written orders and medical justification of the primary care provider. Emergency transfers or discharges may also be mandated in order to protect the health, safety, or well-being of other residents and staff from the resident being transferred. (II)

(2) The transfer or discharge is subsequently agreed to by the resident or the resident's responsible party, and notification is given to the responsible party, the resident's primary care provider, and the person or agency responsible for the resident's placement, maintenance, and care in the facility.

d. A hearing requested pursuant to this subrule shall be held in accordance with subrule 57.14(6). **57.14(5) *Emergency transfer or discharge.*** In the case of an emergency transfer or discharge, the resident must be given a written notice prior to or within 48 hours following transfer or discharge. (II, III)

a. A copy of this notice must be placed in the resident's file. The notice must contain all of the following information:

- (1) The stated reason for the transfer or discharge. (II)
- (2) The effective date of the transfer or discharge. (II)
- (3) A statement, in not less than 12-point type, that reads:

You have a right to appeal the facility's decision to transfer or discharge you on an emergency basis. If you think you should not have to leave this facility, you may request a hearing, in writing or verbally, with the Iowa department of inspections and appeals within 7 days after receiving this notice. You have the right to be represented at the hearing by an attorney or any other individual of your choice. If you request a hearing, it will be held no later than 14 days after receipt of your request by the department. You may be transferred or discharged before the hearing is held or before a final decision is rendered. If you win the hearing, you have the right to be transferred back into the facility. To request a hearing or receive further information, call the department at (515)281-4115, or write to the department to the attention of: Administrator, Division of Health Facilities, Department of Inspections and Appeals, Lucas State Office Building, Des Moines, Iowa 50319-0083. (II)

b. The notice shall be personally delivered to the resident and a copy placed in the resident's record. A copy shall also be transmitted to the department; the resident's responsible party; the resident's primary care provider; the person or agency responsible for the resident's placement, maintenance, and care in the facility; and the department on aging's long-term care ombudsman. The notice shall indicate that a copy has been transmitted to the required parties by using the abbreviation "cc:" and listing the names of all parties to whom copies were sent. (II)

c. A hearing requested pursuant to this subrule shall be held in accordance with subrule 57.14(6).
57.14(6) Hearing.

a. Request for hearing.

(1) The resident must request a hearing within 7 days of receiving the written notice.

(2) The request must be made to the department, either in writing or verbally.

b. The hearing shall be held no later than 14 days after receipt of the request by the department unless the resident requests an extension due to emergency circumstances.

c. Except in the case of an emergency discharge or transfer, a request for a hearing shall stay a transfer or discharge pending a final decision, including the exhaustion of all appeals. (II)

d. The hearing shall be heard by a department of inspections and appeals administrative law judge pursuant to Iowa Code chapter 17A and 481—Chapter 9. The hearing shall be public unless the resident or the resident's legal representative requests in writing that the hearing be closed. In a determination as to whether a transfer or discharge is authorized, the burden of proof by a preponderance of evidence rests on the party requesting the transfer or discharge.

e. Notice of the date, time, and place of the hearing shall be sent by certified mail or delivered in person to the facility, the resident, the responsible party, and the office of the long-term care ombudsman not later than 5 full business days after receipt of the request. The notice shall also inform the facility and the resident or the responsible party that they have a right to appear at the hearing in person or be represented by an attorney or other individual. The appeal shall be dismissed if neither party is present or represented at the hearing. If only one party appears or is represented, the hearing shall proceed with one party present. A representative of the office of the long-term care ombudsman shall have the right to appear at the hearing.

f. The administrative law judge's written decision shall be mailed by certified mail to the licensee, resident, responsible party, and the office of the long-term care ombudsman within 10 working days after the hearing has been concluded.

57.14(7) Nonpayment. If nonpayment is the basis for involuntary transfer or discharge, the resident shall have the right to make full payment up to the date that the discharge or transfer is to be made and then shall have the right to remain in the facility. (II)

57.14(8) Discussion of involuntary transfer or discharge. Within 48 hours after notice of involuntary transfer or discharge has been received by the resident, the facility shall discuss the involuntary transfer or discharge with the resident, the resident's responsible party, and the person or agency responsible for the resident's placement, maintenance, and care in the facility. (II)

a. The facility administrator or other appropriate facility representative serving as the administrator's designee shall provide an explanation and discussion of the reasons for the resident's involuntary transfer or discharge. (II)

b. The content of the explanation and discussion shall be summarized in writing, shall include the names of the individuals involved in the discussion, and shall be made part of the resident's record. (II)

c. The provisions of this subrule do not apply if the involuntary transfer or discharge has already occurred pursuant to subrule 57.14(5) and emergency notice is provided within 48 hours.

57.14(9) Transfer or discharge planning.

a. The facility shall develop a plan to provide for the orderly and safe transfer or discharge of each resident to be transferred or discharged. (II)

b. To minimize the possible adverse effects of the involuntary transfer, the resident shall receive counseling services by the sending facility before the involuntary transfer and by the receiving facility after the involuntary transfer. Counseling shall be documented in the resident's record. (II)

c. The counseling requirement in paragraph 57.14(9)“b” does not apply if the discharge has already occurred pursuant to subrule 57.14(5) and emergency notice is provided within 48 hours.

d. Counseling, if required, shall be provided by a licensed mental health professional as defined in Iowa Code section 228.1(6).

e. The receiving health care facility of a resident involuntarily transferred shall immediately formulate and implement a plan of care which takes into account possible adverse effects the transfer may cause. (II)

57.14(10) Transfer upon revocation of license or voluntary closure. Residents shall not have the right to a hearing to contest an involuntary discharge or transfer resulting from the revocation of the facility’s license by the department of inspections and appeals. In the case of the voluntary closure of a facility, a period of 30 days must be allowed for an orderly transfer of residents to other facilities.

57.14(11) Intrafacility transfer.

a. Residents shall not be arbitrarily relocated from room to room within a licensed health care facility. (I, II) Involuntary relocation may occur only in the following situations, which shall be documented in the resident’s record: (II)

(1) Incompatibility with or disturbing to other roommates.

(2) For the welfare of the resident or other residents of the facility.

(3) To allow a new admission to the facility that would otherwise not be possible due to separation of roommates by sex.

(4) In the case of a resident whose source of payment was previously private, but who now is eligible for Title XIX (Medicaid) assistance, the resident may be transferred from a private room to a semiprivate room or from one semiprivate room to another.

(5) Reasonable and necessary administrative decisions regarding the use and functioning of the building.

b. Unreasonable and unjustified reasons for changing a resident’s room without the concurrence of the resident or responsible party include:

(1) Change from private pay status to Title XIX, except as outlined in subparagraph 57.14(11)“a”(4). (II)

(2) As punishment or behavior modification, except as specified in subparagraph 57.14(11)“a”(1). (II)

(3) Discrimination on the basis of race or religion. (II)

c. If intrafacility relocation is necessary for reasons outlined in paragraph 57.14(11)“a,” the resident shall be notified at least 48 hours prior to the transfer and the reason therefor shall be explained. The responsible party shall be notified as soon as possible. The notification shall be documented in the resident’s record and signed by the resident or responsible party. (II, III)

d. If emergency relocation is required in order to protect the safety or health of the resident or other residents, the notification requirements may be waived. The conditions of the emergency shall be documented. The family or responsible party shall be notified immediately or as soon as possible of the condition that necessitates emergency relocation, and such notification shall be documented. (II, III)

e. A transfer to a part of a facility that has a different license must be handled the same way as a transfer to another facility, and not as an intrafacility transfer. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 3523C, IAB 12/20/17, effective 1/24/18]

481—57.15(135C) Residency agreement.

57.15(1) Each residency agreement shall:

a. State the base rate or scale per day or per month, the services included, and the method of payment. (III)

b. Contain a complete schedule of all offered services for which a fee may be charged in addition to the base rate. (III) Furthermore, the agreement shall:

(1) Stipulate that no further additional fees shall be charged for items not contained in the complete schedule of services; (III)

(2) State the method of payment for additional charges; (III)

(3) Contain an explanation of the method of assessment of such additional charges and an explanation of the method of periodic reassessment, if any, resulting in changing such additional charges; (III)

(4) State that additional fees may be charged to the resident for nonprescription drugs, other personal supplies, and services provided by a barber, beautician, and such. (III)

c. Contain an itemized list of services to be provided to the resident based on an assessment at the time of the resident's admission and in consultation with the administrator and including the specific fee the resident will be charged for each service and the method of payment. (III)

d. Include the total fee to be charged initially to the resident. (III)

e. State the conditions whereby the facility may make adjustments to its overall fees for resident care as a result of changing costs. (II, III) Furthermore, the agreement shall provide that the facility shall give:

(1) Written notification to the resident, or the responsible party when appropriate, of changes in the overall rates of both base and additional charges at least 30 days prior to the effective date of such changes; (II, III)

(2) Notification to the resident, or the responsible party when appropriate, of changes in additional charges, based on a change in the resident's condition. Notification must occur prior to the date such revised additional charges begin. If notification is given orally, subsequent written notification must also be given within a reasonable time, not to exceed one week, listing specifically the adjustments made. (II, III)

f. State the terms of agreement in regard to a refund of all advance payments in the event of the transfer, death, or voluntary or involuntary discharge of the resident. (II, III)

g. State the terms of agreement concerning the holding of and charging for a bed when a resident is hospitalized or leaves the facility temporarily for recreational or therapeutic reasons. The terms shall contain a provision that the bed will be held at the request of the resident or the resident's responsible party. (II, III)

(1) The facility shall ask the resident or responsible party whether the resident's bed should be held. This request shall be made before the resident leaves or within 48 hours after the resident leaves. The inquiry and the response shall be documented. (II, III)

(2) The facility shall inform the resident or responsible party that, when requested, the bed may be held beyond the number of days designated by the funding source, as long as payments are made in accordance with the agreement. (II, III)

h. State the conditions under which the involuntary discharge or transfer of a resident would be effected. (II, III)

i. Set forth any other matters deemed appropriate by the parties to the agreement. No agreement or any provision thereof shall be drawn or construed so as to relieve any health care facility of any requirement or obligation imposed upon it by this chapter or any standards or rules in force pursuant to this chapter. (II, III)

57.15(2) Each party to the residency agreement shall receive a copy of the signed agreement. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.16(135C) Medical examinations.

57.16(1) Each resident in a residential care facility shall have a designated primary care provider who may be contacted when needed. (II, III)

57.16(2) Each resident admitted to a residential care facility shall have a physical examination prior to admission. (II, III)

a. If the resident is admitted directly from a hospital, a copy of the hospital admission physical and discharge summary may be a part of the record in lieu of an additional physical examination. A record of the examination, signed by the primary care provider, shall be a part of the resident's record. (II, III)

b. The record of the admission physical examination and medical history shall portray the current medical status of the resident and shall include the resident's name, sex, age, medical history, physical

examination, diagnosis, statement of medical concerns, diet, and results of any diagnostic procedures. (II, III)

c. Screening and testing for tuberculosis shall be conducted pursuant to 481—Chapter 59. (I, II, III)

57.16(3) The person in charge shall immediately notify the primary care provider of any accident, injury or adverse change in the resident's condition that has the potential for requiring physician intervention. (I, II, III)

57.16(4) Each resident shall be visited by or shall visit the resident's primary care provider at least once each year. The one-year period shall be measured from the date of admission and does not include the resident's preadmission physical. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.17(135C) Records.

57.17(1) *Resident record.* The licensee shall keep a permanent record on every resident admitted to the residential care facility, and all entries in the permanent record shall be current, dated, and signed. (III) The record shall include:

- a.* Name and previous address of resident; (III)
- b.* Birth date, sex, and marital status of resident; (III)
- c.* Church affiliation, if designated; (III)
- d.* Primary care provider's name, telephone number, and address; (III)
- e.* Dentist's name, telephone number, and address; (III)
- f.* Name, address, and telephone number of next of kin or legal representative; (III)
- g.* Name, address, and telephone number of person to be notified in case of emergency; (III)
- h.* Pharmacy name, telephone number, and address; (III)
- i.* Mortuary name, telephone number, and address, if designated; (III)
- j.* Physical examination and medical history; (III)
- k.* Primary care provider's orders for the resident's level of care, medication, treatments, and diet. The orders shall be in writing and signed by the primary care provider quarterly; (III)
- l.* A notation of visits to primary care provider and other professional services; (III)
- m.* Documentation regarding services provided by other providers, including but not limited to home health agencies, hospice, day treatment and those providing medical, mental health and Medicaid waiver services; (III)
- n.* Documentation of any adverse change in the resident's condition; (II, III)
- o.* A notation describing the resident's condition on admission, transfer and discharge; (III)
- p.* A copy of instructions given to the resident, legal representative or facility in the event of discharge or transfer; (III)
- q.* In the event of a resident's death, notations of the date and time of the resident's death, the circumstances of the resident's death, the disposition of the resident's body, and the date and time the resident's family and primary care provider were notified of the resident's death; and (III)
- r.* A notation of disposition of personal property and medications upon the resident's transfer, discharge or death. (III)

57.17(2) *Confidentiality of resident records.* Each resident shall be ensured confidential treatment of all information contained in the resident's records. The resident's written consent shall be required for the release of information to persons not otherwise authorized under law to receive the information. (II)

a. The facility shall limit access to any medical records to staff and professionals providing services to the resident. (II)

b. The facility shall limit access to the resident's personal records, e.g., financial records and social services records, to staff and professionals providing the service to the resident. Only those personnel concerned with the financial affairs of the resident may have access to the financial records. (II)

c. The resident, or the resident's responsible party, shall be entitled to examine all information contained in the resident's record and shall have the right to secure full copies of the record at reasonable cost upon request, unless the primary care provider determines that the disclosure of the record or

section thereof is contraindicated, in which case this information will be deleted prior to making the record available to the resident or responsible party. This determination and the reasons for it must be documented in the resident's record. (II)

d. This subrule is not meant to preclude access to resident records by representatives of state and federal regulatory agencies.

57.17(3) Incident record.

a. Each residential care facility shall maintain an incident record report and shall have available incident report forms. (II, III)

b. Report of incidents shall be in detail on an incident report form. (III)

c. The person in charge at the time of the incident shall oversee the preparation of and sign the incident report. The administrator or designee shall review, sign and date the incident report within 72 hours of the accident, incident or unusual occurrence. (II, III)

d. An incident report shall be completed for every accident or incident where there is apparent injury or where an injury of unknown origin may have occurred. (II)

e. An incident report shall be completed for every accident, incident or unusual occurrence within the facility or on the premises that affects a resident, visitor, or employee. (II, III)

f. A copy of the incident report shall be kept on file in the facility. (II, III)

57.17(4) Retention of records.

a. Records shall be retained in the facility for five years following the termination of services to a resident. (III)

b. Records shall be retained within the facility upon change of ownership. (III)

c. When the facility ceases to operate, a copy of the resident's record shall be released to the facility to which the resident is transferred. (III)

d. When the facility ceases to operate, records shall be maintained for five years in a clean, dry secured storage area. (III)

57.17(5) Electronic records. In addition to the access provided in 481—subrule 50.10(2), an authorized representative of the department shall be provided unrestricted access to electronic records pertaining to the care provided to the residents of the facility. (II, III)

a. If access to an electronic record is requested by the authorized representative of the department, the facility may provide a tutorial on how to use its particular electronic system or may designate an individual who will, when requested, access the system, respond to any questions or assist the authorized representative as needed in accessing electronic information in a timely fashion. (II, III)

b. The facility shall provide a terminal where the authorized representative may access records. (II, III)

c. If the facility is unable to provide direct print capability to the authorized representative, the facility shall make available a printout of any record or part of a record on request in a time frame that does not intentionally prevent or interfere with the department's survey or investigation. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.18(135C) Resident care and personal services.

57.18(1) A complete change of bed linen shall be provided at least once a week and more often if necessary. (III)

57.18(2) Residents shall receive sufficient supervision to promote personal cleanliness. (II, III)

57.18(3) Residents shall have clean clothing as needed. Clothing shall be appropriate to residents' activities and to the weather. (III)

57.18(4) Residents shall be encouraged to bathe at least twice a week. (II, III)

57.18(5) All nonambulatory residents shall be housed on the grade level floor unless the facility has a suitably sized elevator. (II)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.19(135C) Drugs.

57.19(1) Drug storage.

a. Residents who have been certified in writing by their primary care provider as capable of taking their own medications may retain these medications in their bedroom, but locked storage must be provided, with staff and the resident having access. Monitoring of the storage, administration and documentation by the resident shall be carried out by a person who meets the requirements of subrule 57.19(3) and is responsible for administering medications. (II, III)

b. Drug storage for residents who are unable to take their own medications and require supervision shall meet the following requirements:

- (1) Locked storage for drugs, solutions, and prescriptions shall be provided. (III)
- (2) A bathroom shall not be used for drug storage. (III)
- (3) The drug storage shall be kept locked when not in use. (III)
- (4) The drug storage key shall be secured and available only to those employees charged with the responsibility of administering medications. (II, III)
- (5) Schedule II drugs, as defined by Iowa Code chapter 124, shall be kept in a locked box within the locked drug storage. (II, III)
- (6) Medications requiring refrigeration shall be kept locked in a refrigerator and separated from food and other items. (II, III)
- (7) Drugs for external use shall be stored separately from drugs for internal use. (II, III)
- (8) All potent, poisonous, or caustic materials shall be stored separately from drugs, shall be plainly labeled and stored in a specific, well-illuminated cabinet, closet, or storeroom, and shall be made accessible only to authorized persons. (I, II)
- (9) Inspection of drug storage shall be made by the administrator or designee and a registered pharmacist not less than once every three months. The inspection shall be verified by a report signed by the administrator and the pharmacist and filed with the administrator. The report shall include, but not be limited to, certification of the absence of the following: expired drugs, deteriorated drugs, improper labeling, drugs for which there is no current primary care provider's order, and drugs improperly stored. (III)
- (10) Bulk supplies of prescription drugs for multiresident use shall not be kept in a residential care facility. (III)

57.19(2) Drug safeguards.

a. All prescribed medications shall be clearly labeled indicating the resident's full name, primary care provider's name, prescription number, name and strength of drug, dosage, directions for use, date of issue, and name and address and telephone number of pharmacy or primary care provider issuing the drug. Where unit dose is used, prescribed medications shall, at a minimum, indicate the resident's full name, primary care provider's name, name and strength of drug, and directions for use. Standard containers shall be utilized for dispensing drugs. (III)

b. Sample medications provided by the resident's primary care provider shall clearly identify to whom the medications belong. (III)

c. Medication containers having soiled, damaged, illegible, or makeshift labels shall be returned to the issuing pharmacist, pharmacy, or primary care provider for relabeling or disposal. (III)

d. The medication for each resident shall be kept or stored in the original containers unless the resident is participating in an individualized medication program. (II, III)

e. Unused prescription drugs shall be destroyed by the person in charge, in the presence of a witness, and with a notation made on the resident's record or shall be returned to the supplying pharmacist. (III)

f. Prescriptions shall be refilled only with the permission of the resident's primary care provider. (II, III)

g. No medications prescribed for one resident may be administered to or allowed in the possession of another resident. (I, II)

h. Instructions shall be requested from the Iowa board of pharmacy concerning disposal of unused Schedule II drugs prescribed for a resident who has died or for whom the Schedule II drug was discontinued. (III)

i. Discontinued medications shall be destroyed within a specified time by a responsible person, in the presence of a witness, and with a notation made to that effect or shall be returned to the pharmacist for destruction. Drugs listed under the Schedule II drugs shall be destroyed in accordance with the requirements established by the Iowa board of pharmacy. (II, III)

j. All medication orders which do not specifically indicate the number of doses to be administered or the length of time the drug is to be administered shall be stopped automatically after a given time period. The automatic-stop order may vary for different types of drugs. The resident's primary care provider, in conjunction with the pharmacist, shall institute these policies and provide procedures for review and endorsement. (II, III)

k. No resident shall be allowed to possess any medications unless the primary care provider has certified in writing on the resident's medical record that the resident is mentally and physically capable of doing so. (II)

l. No medications or prescription drugs shall be administered to a resident without a written order signed by the primary care provider. (II)

m. The facility shall establish a policy to govern the distribution of prescribed medications to residents who are on leave from the facility. (II, III)

(1) Medications may be issued to residents who will be on leave from a facility for less than 24 hours. Only those medications needed for the time period the resident will be on leave from the facility may be issued. Non-child-resistant containers may be used. Instructions shall be provided and include the date, the resident's name, the name of the facility, and the name of the medication, its strength, dose and time of administration. (II, III)

(2) Medication for residents on leave from a facility for longer than 24 hours shall be obtained in accordance with requirements established by the Iowa board of pharmacy. (II, III)

(3) Medication for residents on leave from a facility may be issued only by facility personnel responsible for administering medication. (II, III)

57.19(3) Drug administration—authorized personnel.

a. A properly trained person shall be charged with the responsibility of administering medications as ordered by a primary care provider. (II, III)

b. The person shall have knowledge of the purpose of the drugs and their dangers and contraindications. (II, III)

c. The person shall be a licensed nurse or primary care provider or shall have successfully completed a department-approved medication aide course and passed a department-approved medication aide challenge examination administered by an area community college. (II, III)

d. Prior to taking a department-approved medication aide course, the person shall have a letter of recommendation for admission to the medication aide course from the employing facility. (III)

e. A person who is a nursing student or a graduate nurse may take the challenge examination in place of taking a medication aide course. The person shall do all of the following before taking the medication aide challenge examination:

(1) Complete a clinical or nursing theory course within six months before taking the challenge examination; (III)

(2) Successfully complete a nursing program pharmacology course within one year before taking the challenge examination; (III)

(3) Provide to the community college a written statement from the nursing program's pharmacology or clinical instructor indicating that the person is competent in medication administration. (III)

f. A person who has written documentation of certification as a medication aide in another state may become a medication aide in Iowa by successfully completing a department-approved nurse aide competency examination and a medication aide challenge examination. The requirements of paragraph 57.19(3) "d" do not apply to this person. (III)

g. In a freestanding residential care facility licensed for 15 or fewer beds, a person who has successfully completed a state-approved medication manager course may administer medications.

57.19(4) Drug administration.

a. Unless the unit dose system is used, the person assigned the responsibility of medication administration must complete the procedure by personally preparing the dose, observing the actual act of swallowing the oral medication, and charting the medication. In facilities where the unit dose system is used, the person assigned the responsibility of medication administration must complete the procedure by observing the actual act of swallowing the oral medication and by charting the medication. Medications shall be prepared on the same shift of the same day that they are administered unless the unit dose system is used. (II)

b. Injectable medications shall be administered as permitted by Iowa law by a registered nurse, licensed practical nurse, primary care provider or pharmacist. For purposes of this subrule, “injectable medications” does not include an epinephrine autoinjector, e.g., an EpiPen. (II, III)

c. A resident certified by the resident’s primary care provider as capable of injecting the resident’s own insulin may do so. Insulin may be administered pursuant to paragraph 57.19(4) “*b*” or as otherwise authorized by the resident’s primary care provider. (II, III) Authorization shall:

- (1) Be in writing,
- (2) Be maintained in the resident’s record,
- (3) Be renewed quarterly,
- (4) Include the name of the person authorized to administer the insulin,
- (5) Include documentation by the primary care provider that the authorized person is qualified to administer insulin to that resident. (II, III)

d. A resident may participate in the administration of the resident’s own medication if the primary care provider has certified in writing in the resident’s medical record that the resident is mentally and physically capable of participating and has explained in writing in the resident’s medical record what the resident’s participation may include.

e. An individual inventory record shall be maintained for each Schedule II drug prescribed for each resident, with an accurate count and authorized signatures at every shift. (II)

f. The facility may use a unit dose system.

g. Medication aides and medication managers may administer PRN medications without contacting a licensed nurse or primary care provider if all of the following apply: (I, II, III)

(1) A written order from the resident’s primary care provider specifies the purpose of the PRN medication and the frequency, dosage and strength of the PRN medication.

(2) The resident’s primary care provider provides in writing specific criteria for administering PRN medications.

(3) The pharmacist assesses the resident’s use of PRN medications when conducting the inspection of drug storage as required by subparagraph 57.19(1) “*b*”(9).

h. The pharmacist shall assess the use of PRN medications when conducting the inspection of drug storage as required by subparagraph 57.19(1) “*b*”(9). (II, III)

i. Medications administered by an employee of the facility shall be recorded on a medication record by the individual who administers the medication. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 2643C, IAB 8/3/16, effective 9/7/16; see Delay note at end of chapter]

481—57.20(135C) Dental services.

57.20(1) The residential care facility personnel shall assist residents in obtaining annual and emergency dental services and shall arrange transportation for such services. (III)

57.20(2) Dental services shall be performed only on the request of the resident, responsible party, legal representative, or primary care provider. The resident’s primary care provider shall be advised of the resident’s dental problems. (III)

57.20(3) All dental reports or progress notes shall be included in the resident record as available. The facility shall make reasonable efforts to obtain the records following the provision of services. (III)

57.20(4) Personal care staff shall assist the resident in carrying out the dentist’s recommendations.

(III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.21(135C) Dietary.**57.21(1) Dietary staffing.**

a. A minimum of one person directly responsible for food preparation shall successfully complete a course meeting the requirements for a food protection program included in the Food Code adopted pursuant to Iowa Code chapter 137F. Another course may be substituted if the course's curriculum includes substantially similar competencies to a course that meets the requirements of the Food Code and the provider of the course files with the department a statement indicating that the course provides substantially similar instruction as it relates to sanitation and safe food handling. (III)

b. If the person is in the process of completing the food protection program in paragraph 57.21(1) "a," the requirement relating to the completion of a state-approved food protection program shall be considered to have been met.

c. In addition to the requirement of paragraph 57.21(1) "a," personnel who are responsible for food preparation or service, or both food preparation and service, shall have an orientation on sanitation and safe food handling prior to handling food and shall have annual in-service training on food protection. (III)

57.21(2) Nutrition and menu planning.

a. Menus shall be planned and followed to meet the nutritional needs of residents in accordance with the primary care provider's orders. Diet orders should be reviewed as necessary, but at least quarterly, by the primary care provider. (II, III)

b. Menus shall be planned and served to include foods and amounts necessary to meet federal dietary guidelines. (II, III)

c. At least three meals or their equivalent shall be served daily, at regular hours. (II, III)

(1) There shall be no more than a 14-hour span between offering a substantial evening meal and breakfast. (II, III)

(2) Unless contraindicated, evening snacks shall be offered routinely to all residents. Special nourishments shall be available when ordered by the primary care provider. (II, III)

d. Menus shall include a variety of foods prepared in various ways. (III)

e. Menus shall be written at least one week in advance. The current menu shall be located in an accessible place for easy use by persons purchasing, preparing, and serving food. (III)

f. Records of menus as served shall be filed and maintained for 30 days and shall be available for review by departmental personnel. When substitutions are necessary or requested, they shall be of similar nutritive value and recorded on the menu or in a notebook. (III)

g. The facility shall provide an alternative choice at scheduled meal times. (III)

57.21(3) Dietary storage, food preparation, and service.

a. All food shall be handled, prepared, served and stored in compliance with the Food Code adopted pursuant to Iowa Code section 137F.2. (I, II, III)

b. Supplies of staple foods for a minimum of a one-week period and of perishable foods for a minimum of a two-day period shall be maintained on the premises. Minimum food portion requirements for a low-cost plan shall conform to information supplied by the bureau of nutrition and health promotion of the department of public health. (II, III)

c. Dishes shall be free of cracks, chips, and stains. (III)

d. If family-style service is used, all leftover prepared food that has been on the table shall be properly handled. (III)

57.21(4) Sanitation in food preparation area.

a. In facilities licensed for more than 15 beds, the kitchen shall not be used for serving meals to residents, food service personnel, or other staff. (III)

b. There shall be written procedures established for cleaning all work and serving areas in facilities with more than 15 beds. (III)

c. A schedule for duties to be performed daily shall be posted in each food area. (III)

d. All cooking equipment in facilities of 15 or more beds shall be provided with a properly sized exhaust system and hood to eliminate excess heat, moisture, and odors from the kitchen. (II, III)

e. The food service area shall be located so it will not be used as a passageway by residents, guests, or non-food service staff. (III)

f. There shall be no washing, ironing, sorting or folding of laundry in the food service area. Dirty linen shall not be carried through the food service area unless the linen is in sealed, leakproof containers. (III)

g. In facilities with more than 15 beds, a mechanical dishwasher is required. (III)

h. A three-compartment pot and pan sink with 110°F (43°C) to 115°F (46°C) water for washing, a compartment for rinsing with water at 170°F (76°C) to 180°F (82°C) for sanitizing with space for air drying, or a two-compartment sink with access to a mechanical dishwasher for sanitizing all utensils shall be provided. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.22(135C) Orientation and service plan.

57.22(1) Orientation. Within 24 hours of admission, each resident shall receive orientation to the facility. The orientation program shall be documented in the resident's file and shall include, but shall not be limited to, a review of the resident's rights, the daily schedule, house rules and the facility's evacuation plan. (II, III)

57.22(2) Initial service plan. Within 48 hours of admission, the administrator or the administrator's designee shall develop an initial service plan to address any immediate health and safety needs. The plan shall be based on information gathered from the resident, family, referring party, primary care provider, and other significant persons. The plan shall be followed until the service plan required in subrule 57.22(3) is complete. (I, II, III)

57.22(3) Service plan. Within 30 days of admission, the administrator or the administrator's designee, in conjunction with the resident, the resident's responsible party, the interdisciplinary team, and any organization that works with or serves the resident, shall develop a written, individualized, and integrated service plan for the resident. The service plan shall be developed and implemented to address the resident's priorities and assessed needs, such as activities of daily living, rehabilitation, activity, and social, behavioral, emotional, physical and mental health. (I, II, III)

a. The service plan shall include measurable goals and objectives and the specific service(s) to be provided to achieve the goals. Each goal shall include the date of initiation and anticipated duration of service(s). Any restriction of rights shall be included in the service plan. (I, II, III)

b. The service plan shall include the documentation procedure for each goal and objective. (II, III)

c. The service plan should be modified to add or delete goals and objectives as the resident's needs change. Communications related to service plan changes or changes in the resident's condition shall occur within five working days of the change and shall be conveyed to all individuals inside and outside the residential care facility who work with the resident, as well as to the resident's responsible party. (I, II, III)

d. The service plan shall be reviewed at least quarterly by relevant staff, the resident and appropriate others, such as the resident's family, case manager and responsible party. The review shall include a written report which addresses a summary of the resident's progress toward goals and objectives and the need for continued services. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.23(135C) Resident activities program.

57.23(1) Activities program. Each residential care facility shall provide an organized resident activities program for the group and for the individual resident which shall include suitable activities. The facility shall offer at least two organized evening group activities per week and two organized weekend group activities per month. (III)

a. The activities program shall be designed to meet the needs and interests of each resident and to assist residents in continuing normal activities within limitations set by the resident's primary care provider. This shall include helping residents continue in their individual interests or hobbies. (III)

b. The activities program shall include measureable goals for each resident. (III)

- c. The activities program shall include both group and individual activities. (III)
- d. Residents shall be encouraged, but not required, to participate in activities. (III)

57.23(2) Coordination of activities program.

a. Each residential care facility with 15 or fewer beds shall designate a person to oversee the activities program, develop goals and monitor progress. (III)

b. Each residential care facility with more than 15 beds shall employ a person to direct the activities program. (III)

c. Staffing for the activities program shall be provided on the minimum basis of 45 minutes per resident per week. (II, III)

d. The activities coordinator shall have completed the activities coordinator orientation course approved by the department within six months of employment or have comparable training and experience as approved by the department. (III)

e. There shall be a written plan for personnel coverage when the activities coordinator is absent during scheduled working hours. (III)

57.23(3) Duties of activities coordinator. The activities coordinator shall:

a. Have access to all residents' records. (III)

b. Coordinate all activities, including volunteer or auxiliary activities and religious services. (III)

c. Keep all necessary records including:

(1) Attendance records; (III)

(2) Individual resident progress notes, recorded at least every three months; (III)

(3) Monthly calendars, prepared in advance, updated as necessary and maintained for one year.

(III)

d. Coordinate the activities program with all other services in the facility. (III)

57.23(4) Supplies, equipment, and storage.

a. Each facility shall provide a variety of supplies and equipment of a nature calculated to fit the needs and interests of the residents. (III)

b. Storage shall be provided for recreational equipment and supplies. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.24(135C) Residents' rights.

57.24(1) Each facility shall ensure that policies and procedures are written and implemented which include, at a minimum, the provisions of this rule and which govern all areas of service provided by the facility. These policies and procedures shall be available to staff, residents, residents' families or legal representatives and the public and shall be reviewed annually. (II, III)

57.24(2) Policies and procedures shall include a method for submitting complaints and recommendations by residents or their responsible parties and for ensuring a response and disposition by the facility. (II, III) The written procedures shall:

a. Ensure the provision of assistance to residents as necessary to complete and submit complaints and recommendations; (II, III)

b. Ensure protection of the resident from any form of reprisal or intimidation; (II, III)

c. Include designation of an employee responsible for handling grievances and recommendations; (II, III)

d. Include a method of investigating and assessing the validity of a grievance or recommendation; (II, III) and

e. Include methods of recording grievances and actions taken. (II, III)

57.24(3) Policies and procedures shall include provisions governing access to, duplication of, and dissemination of information from the residents' records. (II, III)

57.24(4) Policies and procedures shall include a provision that each resident shall be fully informed of the resident's rights and responsibilities as a resident and of all rules governing resident conduct and responsibilities. This information must be provided upon the resident's admission, or in the case of residents already in the facility, upon the facility's adoption or amendment of residents' rights policies. (II, III)

a. The facility shall communicate to residents prior to or within five days after admission what residents may expect from the facility and its staff, and what is expected from residents. The communication shall be in writing, e.g., in a separate handout or brochure describing the facility, and interpreted verbally, e.g., as part of a preadmission interview, resident counseling, or in individual or group orientation sessions following the resident's admission. (II, III)

b. Residents' rights and responsibilities shall be presented in language understandable to the resident. If the facility serves residents who are non-English-speaking or deaf, steps shall be taken to translate the information into a foreign or sign language. In the case of blind residents, either Braille or a recording shall be provided. Residents shall be encouraged to ask questions about their rights and responsibilities and these questions shall be answered. (II, III)

c. A statement shall be signed by the resident, or the resident's responsible party, if applicable, indicating an understanding of these rights and responsibilities and shall be maintained in the resident's record. The statement shall be signed no later than five days after admission, and a copy of the signed statement shall be given to the resident or responsible party. (II, III)

d. In order to ensure that residents continue to be aware of these rights and responsibilities during their stay, a written copy shall be prominently posted in a location that is available to all residents. (II, III)

e. All residents shall be advised within 30 days following changes made in the statement of residents' rights and responsibilities. Appropriate means shall be utilized to inform non-English-speaking, deaf or blind residents of changes. (II, III)

57.24(5) Choice of primary care provider. Each resident shall be permitted free choice of a primary care provider, and pharmacy, if accessible. The facility may require the selected pharmacy to utilize a drug distribution system compatible with the system currently used by the facility. (II)

57.24(6) Each resident shall be afforded the opportunity to participate in the planning of the resident's total care and treatment, which may include, but shall not be limited to, medical care, nutritional needs, activities, and social work services. Each resident has the right to refuse treatment except as provided by Iowa Code chapter 229. In the case of a resident with impaired decision-making skills, the responsible party shall be afforded the opportunity to participate in the planning of the resident's total care and medical treatment and to be informed of the resident's medical condition. (II, III)

57.24(7) Each resident shall be encouraged and assisted throughout the resident's period of stay to exercise the resident's rights as a resident and as a citizen and may voice grievances and recommend changes in policies and services to administrative staff or to outside representatives of the resident's choice, free from interference, coercion, discrimination, or reprisal. (II)

57.24(8) The facility shall provide ongoing opportunities for residents to be aware of and to exercise their rights as residents. Residents shall be kept informed of changes in policies and services that are more restrictive, and their views shall be solicited prior to action. (II)

57.24(9) The facility shall post in a prominent area the text of Iowa Code section 135C.46 (Retaliation Prohibited) and the name, telephone number, and address of the long-term care ombudsman, the department, and the local law enforcement agency to provide residents a further course of redress. (II)

57.24(10) All rights and responsibilities of the resident devolve to the resident's responsible party or any legal surrogate designated in accordance with state law, to the extent permitted by state law. This subrule is not intended to limit the authority of any individual acting pursuant to Iowa Code chapter 144A. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.25(135C) Dignity preserved. The resident shall be treated with consideration, respect, and full recognition of dignity and individuality, including privacy in treatment and in care for personal needs. (I, II)

57.25(1) Staff shall display respect for residents when speaking with, caring for, or talking about them, as constant affirmation of their individuality and dignity as human beings. (I, II)

57.25(2) Schedules of daily activities shall allow maximum flexibility for residents to exercise choice about what they will do and when they will do it. Residents' individual preferences regarding such things as menus, clothing, religious activities, friendships, activity programs, entertainment, sleeping and eating, also times to retire at night and arise in the morning shall be elicited and considered by the facility. (II)

57.25(3) Residents shall be examined and treated in a manner that maintains the privacy of their bodies. A closed door or a drawn curtain shall shield the resident from passersby. People not involved in the care of the residents shall not be present without the resident's consent while the resident is being examined or treated. (II)

57.25(4) Privacy of a resident's body also shall be maintained during toileting, bathing, and other activities of personal hygiene, except as needed for resident safety or assistance. (II)

57.25(5) Staff shall knock and be acknowledged before entering a resident's room unless the resident is not capable of a response. This shall not apply under emergency conditions. (II)
[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.26(135C) Communications. Each resident may communicate, associate, and meet privately with persons of the resident's choice, unless to do so would infringe upon the rights of other residents, and may send and receive personal mail unopened. (II)

57.26(1) Subject to reasonable scheduling restrictions, visiting policies and procedures shall permit residents to receive visits from anyone they wish. Visiting hours shall be posted. (II)

57.26(2) Reasonable, regular visiting hours shall not be less than 12 hours per day and shall take into consideration the special circumstances of each visitor. A particular visitor(s) may be restricted by the facility for one of the following reasons:

- a. The resident refuses to see the visitor(s). (II)
- b. The resident's primary care provider documents specific reasons why such a visit would be harmful to the resident's health. (II)
- c. The visitor's behavior is unreasonably disruptive to the functioning of the facility. This judgment must be made by the administrator, and the reasons shall be documented and kept on file. (II)

57.26(3) Decisions to restrict a visitor are reviewed and reevaluated:

- a. Each time the medical orders are reviewed by the primary care provider;
- b. At least quarterly by the facility's staff; or
- c. At the resident's request. (II)

57.26(4) Space shall be provided for residents to receive visitors in reasonable comfort and privacy. (II)

57.26(5) Telephones shall be available and accessible for residents to make and receive calls with privacy. Residents who need help shall be assisted in using the telephone. (II)

57.26(6) Arrangements shall be made to provide assistance to residents who require help in reading or sending mail. (II)

57.26(7) Residents, including residents court-ordered to the facility, shall be permitted to leave the facility at reasonable times unless there are justifiable reasons established in writing by court order, the primary care provider, the interdisciplinary team, or facility administrator for refusing permission. (II)

57.26(8) Residents shall not have their personal lives regulated beyond reasonable adherence to meal schedules, bedtime hours, and other written policies which may be necessary for the orderly management of the facility and as required by these rules. However, residents shall be encouraged to participate in recreational programs. (II)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.27(135C) Resident activities.

57.27(1) Each resident may participate in activities of social, religious, and community groups at the resident's discretion unless contraindicated for reasons documented by the primary care provider or interdisciplinary team as appropriate in the resident's record. (II)

57.27(2) Residents who wish to meet with or participate in activities of social, religious, or other community groups in or outside of the facility shall be informed, encouraged, and assisted to do so. (II)
[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.28(135C) Resident property.

57.28(1) Residents shall be permitted to keep reasonable amounts of personal clothing and possessions for their use while in the facility. The facility shall offer the resident the opportunity to have personal property itemized and documented on an inventory sheet upon the resident's admission. The inventory sheet shall be kept in a safe location which is convenient to the resident and shall be updated at least annually. At discharge, residents may sign off on a list of the personal property they are taking with them. (II, III)

57.28(2) The facility shall provide for the safekeeping of personal effects, funds and other property of its residents. The facility may require that items of exceptional value or that would convey unreasonable responsibilities to the licensee be removed from the premises of the facility for safekeeping. (III)

57.28(3) Funds or properties received by the facility, belonging or due a resident, expendable for the resident's account, shall be trust funds. (III)
[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.29(135C) Financial affairs—management. Each resident who has not been assigned a guardian or conservator by the court may manage the resident's own personal financial affairs. To the extent the facility assists in management, under written authorization by the resident, the management shall be carried out in accordance with Iowa Code section 135C.24. (II)

57.29(1) The facility shall maintain a written account of all residents' funds received by or deposited with the facility. (II)

57.29(2) An employee shall be designated in writing to be responsible for resident accounts. (II)

57.29(3) The facility shall keep on deposit personal funds over which the resident has control in accordance with Iowa Code section 135C.24. Should the resident request these funds, they shall be given to the resident on request with receipts maintained by the facility and a copy to the resident. In the case of a resident with impaired decision-making skills, the resident's legal representative shall designate a method of disbursing the resident's funds. (II)

57.29(4) If the facility makes financial transactions on a resident's behalf, the facility must document that it has prepared and sent an itemized accounting of disbursements and current balances at least quarterly. A copy of this statement shall be maintained in the resident's financial or business record. (II)

57.29(5) A resident's personal funds shall not be used without the written consent of the resident or the resident's legal representative. (I, II)

57.29(6) A resident's personal funds shall be returned to the resident when the funds have been used without the written consent of the resident or the resident's legal representative. The department may report findings that resident funds have been used without written consent to the department's investigations division or the local law enforcement agency, as appropriate. (II)
[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.30(135C) Resident work. No resident may be required to perform services for the facility, except as provided by Iowa Code section 347B.5. (II)

57.30(1) Residents may not be used to provide a source of labor for the facility against their will. Approval by the primary care provider is required for all work programs. (I, II)

57.30(2) Residents who perform work for the facility must receive compensation unless the work is part of their approved training program. Persons on the resident census who perform work shall not be used to replace paid employees in fulfilling staffing requirements. (II)
[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.31(135C) Family—shared rooms. Family members or spouses shall be permitted to share a room, if available, if requested by both parties, unless the primary care provider of one of the parties

documents in the medical record specific reasons why such an agreement would have an adverse effect on the health of the resident. (II)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.32(135C) Resident abuse prohibited. Each resident shall receive kind and considerate care at all times and shall be free from mental, physical, sexual, and verbal abuse, exploitation, neglect, and physical injury. (I, II)

57.32(1) Mental abuse includes, but is not limited to, humiliation, harassment, and threats of punishment or deprivation. (I, II)

57.32(2) Physical abuse includes, but is not limited to, corporal punishment and the use of restraints as punishment. (I, II)

57.32(3) Drugs such as tranquilizers shall only be used in accordance with orders of the primary care provider. (I, II)

57.32(4) Allegations of dependent adult abuse. Allegations of dependent adult abuse shall be reported and investigated pursuant to Iowa Code chapter 235E and 481—Chapter 52. (I, II, III)

57.32(5) Staff shall receive training relating to the identification and reporting of dependent adult abuse as required by Iowa Code section 235B.16. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 3737C, IAB 4/11/18, effective 5/16/18]

481—57.33(135C) Crisis intervention. If a facility utilizes physical restraints, the facility shall have written policies that define the uses of physical restraints, designate the administrator or designee as the person who may authorize their use, establish a mechanism for monitoring and controlling their use, and provide staff with proper training. (I, II, III)

57.33(1) Temporary physical restraint of residents shall be used only under the following conditions: (I, II)

a. An emergency to prevent injury to the resident or to others; or (I, II)

b. For crisis intervention, but shall not be used for punishment, for the convenience of staff or as a substitution for supervision or programming; (I, II) and

c. No staff person shall use any restraint that obstructs the airway of the resident. (I, II)

57.33(2) Authorization for the use of physical restraints must be prior to or immediately after application of the restraint. (I, II)

57.33(3) Prone restraint is prohibited. Staff persons who find themselves involved in the use of a prone restraint when responding to an emergency must take immediate steps to end the prone restraint. (I, II)

57.33(4) The rationale and authorization for the use of physical restraint and staff action and procedures carried out to protect the resident's rights and to ensure safety shall be clearly set forth in the resident's record by the responsible staff persons. (I, II)

57.33(5) The primary care provider, the interdisciplinary team and the resident's responsible party shall be notified of any restraints administered. (I, II, III)

57.33(6) The facility shall provide to the staff a department-approved training program by qualified professionals on physical restraint techniques. (I, II)

a. The facility shall keep a record of training for review by the department and shall include attendance. (II, III)

b. Only staff with documented training in physical restraint and techniques shall be authorized to assist with physical restraint of a resident. (I, II)

c. Under no circumstances shall a resident be allowed to actively or passively assist in the restraint of another resident. (I, II)

57.33(7) Residents shall not be kept behind locked doors. (I, II)

57.33(8) Mechanical restraint is prohibited. Staff persons who find themselves involved in the use of a mechanical restraint when responding to an emergency must take immediate steps to end the mechanical restraint. (I, II)

[ARC 1753C, IAB 12/10/14, effective 1/14/15; ARC 3738C, IAB 4/11/18, effective 5/16/18]

481—57.34(135C) Safety. The licensee of a residential care facility shall be responsible for the provision and maintenance of a safe environment for residents and personnel. (I, II, III)

57.34(1) Fire safety.

a. All residential care facilities shall meet the fire safety rules and regulations as promulgated by the state fire marshal. (I, II)

b. The size of the facility and needs of the residents shall be taken into consideration in evaluating safety precautions and practices.

57.34(2) Safety duties of administrator. The administrator shall have a written emergency plan to be followed in the event of fire, tornado, explosion, or other emergency. (III)

a. The plan shall be prominently posted in a common area of the building. (III)

b. In-service shall be provided to ensure that all employees are knowledgeable of the emergency plan. (II, III)

57.34(3) Resident safety.

a. Smoking shall be prohibited, except as allowed by Iowa Code chapter 142D, the smokefree air Act. (II, III)

b. Whenever full or empty tanks of oxygen are being used or stored, they shall be securely supported in an upright position. (II, III)

c. Residents shall receive adequate supervision to ensure against hazard from themselves, others, or elements in the environment. (I, II, III)

d. Storage areas for cleaning agents, bleaches, insecticides, or any other poisonous, dangerous, or flammable materials shall be locked. Residents permitted to access these materials shall be supervised by staff as identified in the resident's service plan. (I, II, III)

e. Sufficient numbers of noncombustible trash containers with covers shall be available. (III)

f. Residents' personal possessions that may constitute a hazard to residents or others shall be removed and stored. (III)

57.34(4) First-aid kit. A first-aid emergency kit shall be available on each floor in every facility. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.35(135C) Housekeeping.

57.35(1) Written procedures shall be established and implemented for daily and weekly cleaning schedules. (III)

57.35(2) Each resident room shall be cleaned on a routine schedule. (III)

57.35(3) All rooms, corridors, storage areas, linen closets, attics, and basements shall be kept in a clean, orderly condition, free of unserviceable furniture and equipment and accumulations of refuse. (II, III)

57.35(4) A hallway or corridor shall not be used for storage of equipment. (II, III)

57.35(5) All odors shall be kept under control by cleanliness and proper ventilation. (III)

57.35(6) Clothing worn by personnel shall be clean and washable. (III)

57.35(7) Housekeeping and maintenance personnel shall be provided with well-constructed and properly maintained equipment appropriate to the function for which it is to be used. (III)

57.35(8) All furniture, bedding, linens, and equipment shall be cleaned periodically and before use by another resident. (II, III)

57.35(9) Polishes used on floors shall provide a nonslip finish. (II, III)

57.35(10) Throw or scatter rugs shall have nonskid backing. (II, III)

57.35(11) Entrances, exits, steps, and outside walkways shall be kept free from ice, snow, and other hazards. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.36(135C) Maintenance.

57.36(1) Each facility shall establish a maintenance program to ensure the continued maintenance of the facility, to promote good housekeeping procedures, and to ensure sanitary practices throughout

the facility. In facilities with more than 15 beds, the maintenance program shall be established in writing and available for review by the department. (II, III)

57.36(2) The building, grounds, and other buildings shall be maintained in a clean, orderly condition and in good repair. (II, III)

57.36(3) Window treatments and furniture shall be clean and in good repair. (II, III)

57.36(4) Cracks in plaster, peeling wallpaper or paint, and tears or splits in floor coverings shall be promptly repaired or replaced in a professional manner. (II, III)

57.36(5) The electrical systems, including appliances, cords, and switches, shall be maintained to guarantee safe functioning and comply with the National Electric Code. (II, III)

57.36(6) All plumbing fixtures shall function properly and comply with the state plumbing code. (II, III)

57.36(7) Yearly inspections of the heating and cooling systems shall be made to guarantee safe operation. (II, III)

57.36(8) The building, grounds, and other buildings shall be kept free of breeding areas for flies, other insects, and rodents. (II, III)

57.36(9) The facility shall be kept free of flies, other insects, and rodents. (II, III)

57.36(10) Janitor's closet.

a. Facilities shall be provided with storage for cleaning equipment and supplies. (III)

b. Mops, scrub pails, and other cleaning equipment used in the resident areas shall not be stored or used in the dietary area. (III)

c. In facilities licensed for more than 15 beds, a janitor's closet shall be provided. It shall be equipped with water for filling scrub pails and a janitor's sink for emptying scrub pails. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.37(135C) Laundry.

57.37(1) All soiled linens shall be collected and transported to the laundry room in closed, leakproof laundry bags or covered, impermeable containers. (III)

57.37(2) Except for related activities, the laundry room shall not be used for other purposes. (III)

57.37(3) Procedures shall be written for the proper handling of wet, soiled, and contaminated linens. (III)

57.37(4) Residents' personal laundry shall be marked with an identification if comingled with other residents' personal laundry. (III)

57.37(5) Bed linens, towels, and washcloths shall be clean and stain-free. (III)

57.37(6) If laundry is done in the facility, the following shall be provided:

a. A clean, dry, well-lit area to accommodate a washer and dryer of adequate size to serve the needs of the facility. (III)

b. In facilities with more than 15 beds, the laundry room shall be divided into separate areas, one for sorting soiled linen and one for sorting and folding clean linen. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.38(135C) Garbage and waste disposal.

57.38(1) All garbage shall be gathered, stored, and disposed of in a manner that will not permit transmission of disease, create a nuisance, or provide a breeding or feeding place for vermin or insects. (III)

57.38(2) All containers for refuse shall be watertight and rodent-proof and have tight-fitting covers. (III)

57.38(3) All unlined containers shall be thoroughly cleaned each time the containers are emptied. (III)

57.38(4) All waste shall be properly disposed of in compliance with local ordinances and state codes. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.39(135C) Supplies.**57.39(1) Linen supplies.**

- a. There shall be an adequate supply of linen so that each resident shall have at least three washcloths, hand towels, and bath towels per week. (III)
- b. A complete change of bed linens shall be available in the linen storage area for each bed. (III)
- c. Sufficient lightweight, clean, serviceable blankets shall be available. All blankets shall be laundered as often as necessary for cleanliness and freedom from odors. (III)
- d. Each bed shall be provided with clean, washable bedspreads. There shall be a supply available when changes are necessary. (III)
- e. Adequate storage shall be provided for linens, pillows, and bedding. (III)

57.39(2) Supplies, equipment and storage.

- a. All equipment shall be properly cleaned and sanitized before use by another resident. (III)
- b. Clean and sanitary storage shall be provided for equipment and supplies. (III)
- c. Each facility shall provide a variety of supplies and equipment of a nature calculated to fit the needs and interests of the residents. (III)
- d. Locked storage should be available for potentially dangerous items such as scissors, knives, and toxic materials. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.40(135C) Buildings, furnishings, and equipment.**57.40(1) Buildings—general requirements.**

- a. All windows shall be supplied with window treatments that are kept clean and in good repair. (III)
- b. Whenever glass sliding doors or transparent panels are used, they shall be marked conspicuously. (III)
- c. The facility shall meet the equivalent requirements of the appropriate group occupancy of the state building code. (III)

57.40(2) Furnishings and equipment.

- a. All furnishings and equipment shall be durable, cleanable, and appropriate to their function. (III)
- b. All resident areas shall be decorated, painted, and furnished to provide a homelike atmosphere. (III)
- c. Upholstery materials shall be moisture- and soil-resistant as needed, except on furniture provided by the resident and the property of the resident. (III)

57.40(3) Dining and living rooms.

- a. Every facility shall have a dining room and a living room easily accessible to all residents. (III)
- b. Living rooms shall be maintained for the use of residents and their visitors and may be used for recreational activities. Living rooms shall be suitably furnished. (III)
- c. Dining rooms shall be furnished with dining tables and chairs appropriate to the size and function of the facility. Dining rooms and furnishings shall be kept clean and sanitary. (III)

57.40(4) Bedrooms.

- a. Each resident shall be provided with a standard, single, or twin bed, substantially constructed and in good repair. Rollaway beds, metal cots, or folding beds are not acceptable. (III)
- b. Each bed shall be equipped with the following: casters or glides; clean springs in good repair; a clean, comfortable, well-constructed mattress approximately five inches thick and standard in size for the bed; and clean, comfortable pillows of average bed size. (III)
- c. Each resident shall have a bedside table with a drawer to accommodate personal possessions. (III)
- d. There shall be a comfortable chair, either a rocking chair or armchair, per resident bed. The resident's personal wishes shall be considered. (III)
- e. There shall be drawer space for each resident's clothing. In a bedroom in which more than one resident resides, drawer space shall be assigned to each resident. (III)

f. Beds and other furnishings shall not obstruct free passage to and through doorways. (III)
g. Beds shall not be placed in such a manner that the side of the bed is against the radiator or in close proximity to it unless the radiator is covered so as to protect the resident from contact with it or from excessive heat. (III)

h. There shall be no more than four residents per room. (III)

57.40(5) Bath and toilet facilities.

a. All sinks shall have paper towel dispensers and an available supply of soap. (III)

b. Toilet paper shall be readily available to residents. (III)

57.40(6) Heating. A centralized heating system shall be maintained in good working order and capable of maintaining a comfortable temperature for residents of the facility. Portable units or space heaters are prohibited from being used in the facility except in an emergency. (II, III)

57.40(7) Water supply.

a. Private sources of water supply shall be tested annually and the report made available for review by the department upon request. (III)

b. A bacterially unsafe source of water supply shall be grounds for denial, suspension, or revocation of license. (III)

c. The department may require testing of private sources of water supply at its discretion in addition to the annual test. The facility shall supply reports of such tests as directed by the department. (III)

d. Hot and cold running water under pressure shall be available in the facility. (II, III)

e. Prior to construction of a new facility or new water source, private sources of water supply shall be surveyed and shall comply with the requirements of the department. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.41(135C) Family and employee accommodations.

57.41(1) In facilities where the total occupancy of family, employees, and residents is more than five, separate bathing and toilet facilities shall be required for the family or employees distinct from such areas provided for the residents. (III)

57.41(2) In all facilities, if the family or employees live within the facility, separate living quarters and recreation facilities shall be required for the family or employees distinct from such areas provided for the residents. (III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.42(135C) Animals. No animals shall be allowed to reside in the facility except with written approval of the department and under controlled conditions. (II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.43(135C) Another business or activity in a facility. A facility is allowed to have another business or activity in a health care facility or in the same physical structure of the facility, if the other business or activity is under the control of and is directly related to and incidental to the operation of the health care facility, or the business or activity is approved by the department and the state fire marshal. (I, II, III)

57.43(1) To obtain the approval of the department and the state fire marshal, the facility must submit to the department a written request for approval which identifies the service(s) to be offered by the business and addresses the factors outlined in paragraphs 57.43(2) “a” through “j.” (I, II, III)

57.43(2) The following factors will be considered by the department in determining whether a business or activity will interfere with the use of the facility by residents, interfere with services provided to residents, or be disturbing to residents:

a. Health and safety risks for residents;

b. Compatibility of the proposed business or activity with the facility program;

c. Noise created by the proposed business or activity;

d. Odors created by the proposed business or activity;

- e.* Use of entrances and exits for the business or activity in regard to safety and disturbance of residents and interference with delivery of services;
- f.* Use of the facility's corridors or rooms as thoroughfares to the business or activity in regard to safety and disturbance of residents and interference with delivery of services;
- g.* Proposed staffing for the business or activity;
- h.* Sharing of services and staff between the proposed business or activity and the facility;
- i.* Facility layout and design; and
- j.* Parking area utilized by the business or activity.

57.43(3) Approval of the state fire marshal shall be obtained before approval of the department will be considered.

57.43(4) A business or activity conducted in a health care facility or in the same physical structure as a health care facility shall not reduce space, services or staff available to residents below minimums required in these rules and 481—Chapter 60. (I, II, III)

[ARC 1753C, IAB 12/10/14, effective 1/14/15]

481—57.44(135C) Respite care services. “Respite care services” means an organized program of temporary supportive care provided for 24 hours or more to a person in order to relieve the usual caregiver of the person from providing continual care to the person. “Respite care services” does not include crisis stabilization services provided pursuant to 2014 Iowa Acts, chapter 1044 (to be codified at Iowa Code section 225C.19A). “Respite care individual” means a person receiving respite care services. A residential care facility which chooses to provide respite care services must meet the following requirements related to respite services and must be licensed as a residential care facility. (II, III)

57.44(1) Length of stay. Respite care may be provided for no more than 30 consecutive days and for a total of no more than 60 days in a consecutive 12-month period. The 12-month period begins on the first day of the respite care individual's stay at the facility. (II, III)

57.44(2) No separate license. A residential care facility which chooses to provide respite care services is not required to obtain a separate license or pay a license fee.

57.44(3) Involuntary termination of respite services. The facility may terminate the respite services for a respite care individual. Rule 481—57.14(135C) shall not apply. The facility shall make proper arrangements for the welfare of the respite care individual prior to involuntary termination of respite services, including notification of the respite care individual's family or legal representative. (II, III)

57.44(4) Contract. Pursuant to rule 481—57.15(135C), the facility shall have a contract with each resident in the facility. When an individual is there for respite care services, the contract shall specify the time period during which the individual will be considered to be receiving respite care services. At the end of that period, the contract may be amended to extend that period of time. The contract shall specifically state that respite care services may be involuntarily terminated. The contract shall meet other requirements under rule 481—57.15(135C), except the requirements under subrule 57.15(7). (II, III)

57.44(5) Admission as a resident.

a. An individual being cared for under a respite care contract shall not be considered an admission to the facility.

b. A respite care individual shall be included in the facility's census.

c. The facility shall not enter into multiple 30-day contracts with an individual being cared for under a respite care contract in order to lengthen the individual's stay at the facility. (II, III)

d. If an individual being cared for under a respite care contract remains in the facility beyond 30 consecutive days and is eligible for admission, the department shall consider the individual a resident in the facility. The facility shall follow all requirements for the individual's admission to the facility. (II, III)

57.44(6) Level of care. Respite care services shall not be provided by a health care facility to persons requiring a level of care which is higher than the level of care the facility is licensed to provide. (I, II, III)

57.44(7) Reporting requirements. The reporting requirements of rule 481—50.7(135C) shall apply to residents being cared for under a respite care contract. (I, II, III)
 [ARC 1753C, IAB 12/10/14, effective 1/14/15]

These rules are intended to implement Iowa Code section 135C.14.

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⁰ Two or more ARCs

¹ Effective date of 470—57.15(2)“a” and “b” delayed until the expiration of 45 calendar days into the 1987 session of the General Assembly pursuant to Iowa Code section 17A.8(9), IAB 6/4/86.

² See IAB, Inspections and Appeals Department.

³ Effective date of 481—57.12(2)“a,” last paragraph, delayed 70 days by the Administrative Rules Review Committee at its meeting held July 8, 1993.

⁴ September 7, 2016, effective date of 57.19(3)“d,” 62.15(2)“d,” and 63.18(3)“d” [ARC 2643C] delayed 70 days by the Administrative Rules Review Committee at its meeting held August 5, 2016.

CHAPTER 62

RESIDENTIAL CARE FACILITIES FOR PERSONS WITH MENTAL ILLNESS (RCFs/PMI)

481—62.1(135C) Applicability. This chapter relates specifically to the licensing and regulation of residential care facilities for persons with mental illness (RCFs/PMI). Refer to 481—Chapter 57 for the licensing and regulation of all residential care facilities, including RCFs/PMI, and to 481—Chapter 60 for minimum physical standards for all residential care facilities.

[ARC 3739C, IAB 4/11/18, effective 5/16/18]

481—62.2(135C) Definitions. In addition to the definitions in 481—Chapter 57 and Iowa Code chapter 135C, the following definitions apply.

“*Commission*” means the mental health and disability services commission.

“*Department*” means the Iowa department of inspections and appeals.

“*Dependent adult abuse*” is as defined in rule 481—52.1(235E).

“*Evaluation services*” means those activities designed to identify a person’s current level of functioning and those factors which are barriers to maintaining the current level or achieving a higher level of functioning.

“*Interdisciplinary team process*” means an approach to assessment, service planning, and service implementation in which members of an interdisciplinary team utilize the skills, competencies, insights and perspectives provided by each member’s training and experience to develop a single, integrated, individual program plan to meet a resident’s needs for services.

“*Level of functioning*” means a person’s current physiological and psychological status and current academic, community living, self-care, and vocational skills.

“*Mental health counselor*” means a person who is certified or eligible for certification as a mental health counselor by the National Academy of Certified Clinical Mental Health Counselors.

“*Mental illness*” means a substantial disorder of thought or mood which significantly impairs judgment, behavior, or the capacity to recognize reality or the ability to cope with the ordinary demands of life. Mental disorders include the organic and functional psychoses, neuroses, personality disorders, alcoholism and drug dependence, behavioral disorders and other disorders as defined by the current edition of American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders.

“*Physical or physiological treatment*” means those activities designed to prevent, halt, control, relieve, or reverse symptoms or conditions which interfere with the physical or physiological functioning of the human body.

“*Psychiatric advanced registered nurse practitioner*” means an individual currently licensed as a registered nurse under Iowa Code chapter 152 or 152E who holds a national certification in psychiatric mental health care and who is licensed by the board of nursing as an advanced registered nurse practitioner.

“*Psychiatric nurse*” means a person who meets the requirements of a certified psychiatric nurse, is eligible for certification by the American Nursing Association, and is licensed by the state of Iowa to practice nursing as defined in Iowa Code chapter 152.

“*Psychiatrist*” means a doctor of medicine or osteopathic medicine and surgery who is certified by the American Board of Psychiatry and Neurology or who is eligible for certification.

“*Psychologist*” means a person who is licensed to practice psychology in the state of Iowa, or is certified by the Iowa department of education as a school psychologist, or is eligible for certification, or meets the requirements for eligibility for a license to practice psychology in the state of Iowa that were effective prior to July 1, 1985.

“*Psychotherapeutic treatment*” means those activities designed to assist a person in the identification or modification of beliefs, emotions, attitudes, or behaviors in order to maintain or improve the person’s functioning in response to the physical, emotional and social environment.

“*Qualified mental health professional*” or “*QMHP*” means a person who:

1. Is a psychiatrist, psychologist, social worker, certified psychiatric nurse, psychiatric advanced registered nurse practitioner, or mental health counselor; or

2. Is a doctor of medicine or osteopathic medicine, a physician assistant, or an advanced registered nurse practitioner and has at least one year's documented supervised experience in providing mental health services; or

3. Has a master's degree with coursework focusing on diagnosis, evaluation, and psychotherapeutic treatment of mental health problems and mental illness; or

4. Is employed by a community mental health center or mental health service provider accredited by the commission and has less than a master's degree but at least a bachelor's degree and sufficient education and experience as determined by the chief administrative officer of the community mental health center, with the approval of the commission, with coursework and experience focusing on diagnosis and evaluation and treatment of persons with mental health problems and mental illness.

If the person is practicing in a field covered by an Iowa licensure law, the person shall hold a current Iowa license.

"Resident" means a person who has been admitted to the facility to receive care and services.

"Social worker" means a person who is licensed to practice social work in the state of Iowa or who is eligible for licensure.

[ARC 3739C, IAB 4/11/18, effective 5/16/18]

481—62.3(135C) Personnel. In addition to personnel requirements found in 481—Chapter 57, the RCF/PMI shall provide for services of a qualified mental health professional, by direct employment or contract, whose responsibilities shall include, but not be limited to: (II, III)

1. Approval of each resident's service plan; (II, III)
2. Monitoring the implementation of each resident's service plan; (II, III)
3. Recording each resident's progress; and (II, III)
4. Participating in a periodic review of each resident's service plan. (II, III)

[ARC 3739C, IAB 4/11/18, effective 5/16/18]

481—62.4(135C) Admission criteria. In addition to admission criteria found in 481—Chapter 57, the facility's admission criteria shall include but not be limited to age, sex, diagnosis from the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders, substance abuse, dual diagnosis and criteria that are consistent with the résumé of care. (III)

[ARC 3739C, IAB 4/11/18, effective 5/16/18]

481—62.5(135C) Evaluation services.

62.5(1) Evaluation services shall be provided to each resident. An annual evaluation of each resident shall be completed no later than 12 months from the date of the last available evaluation. For residents who are on leave from a state mental health institution, the institution shall be responsible for the completion of the evaluation. The facility shall ensure the completion of the evaluation of all other residents. The annual evaluation shall identify physical health and current level of functioning and need for services. (II, III)

62.5(2) The portion of the evaluation to identify the resident's physical health shall:

- a. Result in identification of current illness and disabilities and recommendations for physical and physiological treatment and services. (II, III)
- b. Include an evaluation of the resident's ability for health maintenance. (III)
- c. Be performed by a primary care provider. (II, III)

62.5(3) Evaluation.

a. The portion of the evaluation to identify the resident's current level of functioning and need for services shall:

- (1) Identify the resident's level of functioning and need for services in each of the following areas: self-care, community living skills, psychotherapeutic treatment, vocational skills, and academic skills. (II, III)
- (2) Be of sufficient detail to determine the appropriateness of placement according to the skills and needs of the resident. (II, III)
- (3) Be made without regard to the availability of services. (III)

- (4) Be performed by a QMHP, in consultation with the interdisciplinary team. (II, III)
- b. If an evaluation is available from the referral source, the evaluation shall be secured by the facility prior to the admission of the applicant. (III)
- c. If an evaluation is not available or does not contain all the required information, the facility shall ensure an evaluation to the extent necessary to determine if the applicant meets the criteria for admission. For those admitted, the remainder of the evaluation shall be performed prior to the development of a service plan. (III)
- d. Results of all evaluations shall be in writing and maintained in the resident's record. Evaluations subsequent to the initial evaluation shall be performed in sufficient detail to determine changes in the resident's physical health, skills and need for services. (II, III)

62.5(4) A narrative social history shall be completed for each resident within 30 days of admission and approved by the qualified mental health professional prior to the development of the service plan. (III)

a. When the social history was secured from another provider, the information contained shall be reviewed within 30 days of admission. The date of the review, signature of the staff reviewing the history, and a summary of significant changes in the information shall be entered in the resident's record. (III)

b. An annual review of the information contained within the social history shall be incorporated into the service plan progress note. (III)

c. The social history shall minimally address the following areas:

- (1) Referral source and reason for admission, (II, III)
- (2) Legal status, (II, III)
- (3) A description of previous living arrangements, (III)
- (4) A description of previous services received and summary of current service involvements, (II, III)
- (5) A summary of significant medical conditions including, but not limited to, illnesses, hospitalizations, past and current drug therapies, and special diets, (II, III)
- (6) Substance abuse history, (II, III)
- (7) Work history, (III)
- (8) Educational history, (III)
- (9) Relationship with family, significant others, and other support systems, (III)
- (10) Cultural and ethnic background and religious affiliation, (II, III)
- (11) Hobbies and leisure time activities, (III)
- (12) Likes, dislikes, habits, and patterns of behavior, (II, III)
- (13) Impressions and recommendations. (II, III)

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CHAPTER 63
RESIDENTIAL CARE FACILITY—THREE- TO FIVE-BED SPECIALIZED LICENSE
[Prior to 7/15/87, Health Department[470] Ch 63]

481—63.1(135C) Definitions. For the purpose of these rules, the following terms shall have the meanings indicated in this chapter. The definitions set out in Iowa Code section 135C.1 shall be considered to be incorporated verbatim in the rules.

“Accommodation” means the provision of lodging, including sleeping, dining, and living areas.

“Administrator” means a person approved by the department who administers, manages, supervises, and is in general administrative charge of a three- to five-bed residential care facility, whether or not such individual has an ownership interest in such facility, and whether or not the functions and duties are shared with one or more individuals.

“Ambulatory” means the condition of a person who immediately and without aid of another person is physically and mentally capable of traveling a normal path to safety, including the ascent and descent of stairs.

“Basement” means that part of a building where the finish floor is more than 30 inches below the finish grade of the building.

“Board” means the regular provision of meals.

“Change of ownership” means the purchase, transfer, assignment or lease of a licensed three- to five-bed residential care facility.

“Communicable disease” means a disease caused by the presence within a person’s body of a virus or microbial agents which may be transmitted either directly or indirectly to other persons.

“Department” means the state department of inspections and appeals.

“Interdisciplinary team” means the group of persons who develop a single, integrated, individual program plan to meet a resident’s needs for services. The interdisciplinary team consists of, at a minimum, the resident, the resident’s legal guardian if applicable, the resident’s advocate if desired by the resident, a referral agency representative, other appropriate staff members, other providers of services, and other persons relevant to the resident’s needs.

“Legal representative” means the resident’s guardian or conservator if one has been appointed or the resident’s power of attorney.

“Mechanical restraint” means restriction by the use of a mechanical device of a resident’s mobility or ability to use the hands, arms or legs.

“Medication” means any drug, including over-the-counter substances.

“Nonambulatory” means the condition of a person who immediately and without the aid of another person is not physically or mentally capable of traveling a normal path to safety, including the ascent and descent of stairs.

“Personal care” means assistance with the activities of daily living which the recipient can perform only with difficulty. Examples are help in getting in and out of bed, assistance with personal hygiene and bathing, help with dressing and eating, and supervision over medications which can be self-administered.

“Physical restraint” means direct physical contact on the part of a staff person to control a resident’s physical activity for the resident’s own protection or for the protection of others.

“Primary care provider” means any of the following who provide primary care and meet licensure standards:

1. A physician who is a family or general practitioner or an internist.
2. An advanced registered nurse practitioner.
3. A physician assistant.

“Program of care” means all services being provided for a resident in a health care facility.

“Prone restraint” means a restraint in which a resident is in a face-down position against the floor or another surface.

“Rate” means that daily fee charged for all residents equally and shall include the cost of all minimum services required in these rules.

“Records” includes electronic records.

“*Responsible party*” means the person who signs or cosigns the residency agreement required by rule 481—63.12(135C) or the resident’s legal representative. In the event that a resident has neither a legal representative nor a person who signed or cosigned the resident’s residency agreement, the term “responsible party” shall include the resident’s sponsoring agency, e.g., the department of human services, the U.S. Department of Veterans Affairs, a religious group, fraternal organization, or foundation that assumes responsibility and advocates for its client patients and pays for their health care.

“*Restraints*” means the measures taken to control a resident’s physical activity for the resident’s own protection or for the protection of others.

“*Specialized residential care facility license*” means a license for three- to five-bed residential care facilities serving persons with an intellectual disability, chronic mental illness, a developmental disability or brain injury.

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.2(135C,17A) Waiver or variance. A waiver or variance from these rules may be granted by the director of the department in accordance with 481—Chapter 6. A request for waiver or variance will be granted or denied by the director within 120 calendar days of receipt.

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.3(135C) Application for licensure.

63.3(1) Application and licensing—new facility or change of ownership. In order to obtain a specialized residential care facility license for a facility not currently licensed as a specialized residential care facility or for a specialized residential care facility when a change of ownership is contemplated, the applicant must:

- a. Make application at least 30 days prior to the proposed opening date of the facility. Application shall be made on forms provided by the department.
- b. Meet all of the rules, regulations, and standards contained in this chapter and in 481—Chapters 50 and 60. Exceptions noted in 481—subrule 60.3(2) shall not apply.
- c. Submit a letter of intent and a written résumé of care. The résumé of care shall meet the requirements of subrule 63.3(2).
- d. Submit a floor plan of each floor of the residential care facility. The floor plan of each floor shall be drawn on 8½" × 11" paper, show room areas in proportion, room dimensions, window and door locations, designation of the use of each room, and the room numbers for all rooms, including bathrooms.
- e. Submit a photograph of the front and side of the residential care facility.
- f. Submit the fee for a specialized residential care facility license in accordance with 481—paragraph 50.3(2)“a.”
- g. Comply with all other local statutes and ordinances in existence at the time of licensure.
- h. Submit a certificate signed by the state or local fire inspection authority as to compliance with fire safety rules and regulations.

63.3(2) Résumé of care. The résumé of care shall describe the following:

- a. Purpose of the facility;
- b. Criteria for admission to the facility;
- c. Ownership of the facility;
- d. Composition and responsibilities of the governing board;
- e. Qualifications and responsibilities of the administrator;
- f. Medical services provided to residents, to include the availability of emergency medical services in the area and the designation of a primary care provider to be responsible for residents in an emergency;
- g. Dental services provided to residents and available in the area;
- h. Nursing services provided to residents, if applicable;
- i. Personal services provided to residents, including supervision of or assistance with activities of daily living;
- j. Activity program;

- k.* Dietary services, including qualifications of the person in charge, consultation service (if applicable) and meal service;
- l.* Other services available as applicable, including social services, physical therapy, occupational therapy, and recreational therapy;
- m.* Housekeeping;
- n.* Laundry;
- o.* Physical plant; and
- p.* Staffing provided to meet residents' needs.

63.3(3) *Renewal application.* In order to obtain a renewal of the specialized residential care facility license, the applicant must submit the following:

- a.* The completed application form 30 days prior to the annual license renewal date of the residential care facility license;
- b.* The fee for a specialized residential care facility license in accordance with 481—paragraph 50.3(2) “a”;
- c.* An approved current certificate signed by the state or local fire inspection authority as to compliance with fire safety rules and regulations;
- d.* Changes to the résumé of care, if any; and
- e.* Changes to the current residency agreement, if any.

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.4(135C) Issuance of license. Licenses are issued to the person, entity or governmental unit with responsibility for the operation of the facility and for compliance with all applicable statutes, rules and regulations.

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.5(135C) General requirements.

63.5(1) The license shall be displayed in the facility in a conspicuous place which is accessible to the public. (III)

63.5(2) The license shall be valid only in the possession of the licensee to whom it is issued.

63.5(3) The posted license shall accurately reflect the current status of the facility. (III)

63.5(4) The license shall expire one year after the date of issuance or as indicated on the license.

63.5(5) The licensee shall:

- a.* Assume the responsibility for the overall operation of the facility. (I, II, III)
- b.* Be responsible for compliance with all applicable laws and with the rules of the department. (I, II, III)
- c.* Provide an organized continuous 24-hour program of care commensurate with the needs of the residents. (I, II, III)

63.5(6) Each citation or a copy of each citation issued by the department for a class I or class II violation shall be prominently posted by the facility in plain view of the residents, visitors, and persons inquiring about placement in the facility. The citation or copy of the citation shall remain posted until the violation is corrected to the satisfaction of the department. (I, II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.6(135C) Required notifications to the department. The department shall be notified:

63.6(1) Thirty days before any proposed change in the residential care facility's functional operation or addition or deletion of required services; (III)

63.6(2) Thirty days before the beginning of the renovation, addition, functional alteration, change of space utilization, or conversion in the residential care facility or on the premises; (III)

63.6(3) Thirty days before closure of the residential care facility; (III)

63.6(4) Within two weeks of any change in administrator; (III)

63.6(5) Ninety days before a change in the category of license; (III)

63.6(6) Thirty days before a change of ownership. The licensee shall:

- a.* Inform the department of the pending change of ownership; (III)

b. Inform the department of the name and address of the prospective purchaser, transferee, assignee, or lessee; (III)

c. Submit a written authorization to the department permitting the department to release all information of whatever kind from the department's files concerning the licensee's residential care facility to the named prospective purchaser, transferee, assignee, or lessee. (III)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.7(135C) Administrator. Each facility shall have one person in charge, duly approved by the department or acting in a provisional capacity in accordance with these rules. (III)

63.7(1) Qualifications of an administrator.

a. The administrator shall be at least 21 years of age and shall have a high school diploma or equivalent. (III) In addition, this person shall meet at least one of the following conditions:

(1) Have a two-year degree in human services, psychology, sociology, nursing, health care administration, public administration, or a related field and have a minimum of two years' experience in the field; or (III)

(2) Have a four-year degree in human services, psychology, sociology, nursing, health care administration, public administration, or a related field and have a minimum of one year of experience in the field; or (III)

(3) Have a master's degree in human services, psychology, sociology, nursing, health care administration, public administration, or a related field and have a minimum of one year of experience in the field; or (III)

(4) Be a licensed nursing home administrator; or (III)

(5) Have completed a one-year educational training program approved by the department for residential care facility administrators; or (III)

(6) Have passed the National Association of Long Term Care Administrator Boards (NAB) RC/AL administrator licensure examination; or

(7) Have two years of direct care experience and at least six months of administrative experience in a residential care facility. (III)

b. The administrator shall have at least one year of documented experience in a supervisory or direct care position working with persons with an intellectual disability, mental illness, a developmental disability, or brain injury.

c. An individual employed as an administrator on May 16, 2018, will be deemed to meet the requirements of this subrule.

63.7(2) Duties of an administrator. The administrator shall:

a. Select and direct competent personnel who provide services for the residential care program. (III)

b. Provide in-service educational programming for all employees with direct resident contact and maintain records of programs and participants. (III) In-service educational programming offered during each calendar year shall include, at minimum, the following topics: (I, II, III)

(1) Infection control.

(2) Emergency preparedness (e.g., fire, tornado, flood, 911).

(3) Meal time procedures/dietary.

(4) Resident activities.

(5) Mental illness, brain injury or intellectual disabilities, including behavioral intervention, de-escalation, and crisis intervention techniques.

(6) Resident safety/supervision.

(7) Resident rights.

(8) Medication education, to include administration, storage and drug interactions.

(9) Resident service plans/programming/goals.

63.7(3) Administrator serving at more than one residential care facility. The administrator may be responsible for no more than 150 beds in total if the administrator is an administrator of more than one facility. (II)

a. An administrator of more than one facility shall designate in writing an administrative staff person in each facility who shall be responsible for directing programs in the facility.

b. The administrative staff person designated by the administrator shall:

(1) Have at least one year of documented experience in a supervisory or direct care position working with persons with an intellectual disability, mental illness, a developmental disability, or brain injury; (II, III)

(2) Be knowledgeable of the operation of the facility; (II, III)

(3) Have access to records concerned with the operation of the facility; (II, III)

(4) Be capable of carrying out administrative duties and of assuming administrative responsibilities; (II, III)

(5) Be at least 21 years of age; (III)

(6) Be empowered to act on behalf of the licensee concerning the health, safety and welfare of the residents; and (II, III)

(7) Have training in emergency response, including how to respond to residents' sudden illnesses. (II, III)

c. If an administrator serves more than one facility, the administrator must designate in writing regular and specific times during which the administrator will be available to consult with staff and residents to provide direction and supervision of resident care and services. (II, III)

63.7(4) Provisional administrator. A provisional administrator may be appointed on a temporary basis by the residential care facility licensee to assume the administrative responsibilities for a residential care facility for a period not to exceed one year when the facility has lost its administrator and has not been able to replace the administrator, provided that the department has been notified and has approved the provisional administrator prior to the date of the provisional administrator's appointment. (III) The provisional administrator must meet the requirements of paragraph 63.7(3) "b."

63.7(5) Temporary absence of administrator.

a. In the temporary absence of the administrator, a responsible person shall be designated in writing to the department to be in charge of the facility. (III) The person designated shall:

(1) Be knowledgeable of the operation of the facility; (III)

(2) Have access to records concerned with the operation of the facility; (III)

(3) Be capable of carrying out administrative duties and of assuming administrative responsibilities; (III)

(4) Be at least 21 years of age; (III)

(5) Be empowered to act on behalf of the licensee during the administrator's absence concerning the health, safety, and welfare of the residents; (III)

(6) Have training in emergency response, including how to respond to residents' sudden illnesses. (II, III)

b. If the administrator is absent for more than six weeks, a provisional administrator must be appointed pursuant to subrule 63.7(4).

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.8(135C) Personnel.

63.8(1) Alcohol and drug use prohibited. No person under the influence of intoxicating drugs or alcoholic beverages shall be permitted to provide services in a residential care facility. (I, II)

63.8(2) Job description. There shall be a written job description developed for each category of worker. The job description shall include the job title, responsibilities and qualifications. (III)

63.8(3) Employee criminal record, child abuse and dependent adult abuse checks and employment of individuals who have committed a crime or have a founded abuse. The facility shall comply with the requirements found in Iowa Code section 135C.33 and rule 481—50.9(135C) related to completion of criminal record checks, child abuse checks, and dependent adult abuse checks and to employment of individuals who have committed a crime or have a founded abuse. (I, II, III)

63.8(4) Personnel record. A personnel record shall be kept for each employee and shall include but not be limited to the following information about the employee: name and address; social security

number; date of birth; date of employment; position; job description; experience and education; results of criminal record checks, child abuse checks and dependent adult abuse checks; and date of discharge or resignation. (III)

63.8(5) *Supervision and staffing.*

- a. The facility shall provide sufficient staff to meet the needs of the residents served. (I, II, III)
- b. Personnel in a specialized residential care facility shall provide 24-hour coverage for residential care services. Personnel shall be up and dressed when residents are awake. (I, II, III)
- c. Direct care staff shall be present in the facility unless all residents are involved in activities away from the facility. (I, II, III)
- d. Staff shall be aware of and provide supervision levels based on the present needs of the residents in the staff's care. The facility shall document the supervision of residents who require more than general supervision, as defined by facility policy. (I, II, III)
- e. The facility shall maintain an accurate record of actual hours worked by employees. (III)

63.8(6) *Physical examination and screening.* Employees shall have a physical examination within 12 months prior to beginning employment and every four years thereafter. Screening and testing for tuberculosis shall be conducted pursuant to 481—Chapter 59. (I, II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.9(135C) General policies. The licensee shall establish and implement written policies and procedures as set forth in this rule. The policies and procedures shall be available for review by the department, other agencies designated by Iowa Code section 135C.16(3), staff, residents, residents' families or legal representatives, and the public and shall be reviewed by the licensee annually. (II)

63.9(1) *Facility operation.* The licensee shall establish written policies for the operation of the facility, including but not limited to the following: (III)

- a. Personnel; (III)
- b. Admission; (III)
- c. Evaluation services; (II, III)
- d. Programming and individual program plans; (II, III)
- e. Registered sex offender management; (II, III)
- f. Crisis intervention; (II, III)
- g. Discharge or transfer; (III)
- h. Medication management, including self-administration of medications and chemical restraints; (III)
- i. Resident property; (II, III)
- j. Resident finances; (II, III)
- k. Records; (III)
- l. Health and safety; (II, III)
- m. Nutrition; (III)
- n. Physical facilities and maintenance; (III)
- o. Resident rights; (II, III)
- p. Investigation and reporting of alleged dependent adult abuse; (II, III)
- q. Investigation and reporting of accidents or incidents; (II, III)
- r. Transportation of residents; (II, III)
- s. Resident supervision; (II, III)
- t. Smoking; (III)
- u. Visitors; (III)
- v. Disaster/emergency planning; (III) and
- w. Infection control. (III)

63.9(2) *Personnel policies.* Written personnel policies shall include the hours of work and attendance at educational programs. (III)

63.9(3) *Infection control.* The facility shall have a written and implemented infection control program, which shall include policies and procedures based on guidelines issued by the Centers for

Disease Control and Prevention, U.S. Department of Health and Human Services. The infection control program shall address the following:

- a. Techniques for hand washing; (I, II, III)
- b. Techniques for the handling of blood, body fluids, and body wastes; (I, II, III)
- c. Dressings, soaks or packs; (I, II, III)
- d. Infection identification; (I, II, III)
- e. Resident care procedures to be used when there is an infection present; (I, II, III)
- f. Sanitation techniques for resident care equipment; (I, II, III)
- g. Techniques for sanitary use and reuse of feeding syringes and single-resident use and reuse of urine collection bags; (I, II, III) and
- h. Techniques for use and disposal of needles, syringes, and other sharp instruments. (I, II, III)

63.9(4) Resident care techniques. The facility shall have written and implemented procedures to be followed if a resident needs any of the following treatment or devices:

- a. Intravenous or central line catheter; (I, II, III)
- b. Urinary catheter; (I, II, III)
- c. Respiratory suction, oxygen or humidification; (I, II, III)
- d. Decubitus care; (I, II, III)
- e. Tracheostomy; (I, II, III)
- f. Nasogastric or gastrostomy tubes; (I, II, III)
- g. Sanitary use and reuse of feeding syringes and single-resident use and reuse of urine collection bags. (I, II, III)

63.9(5) Emergency care. The facility shall establish written policies for the provision of emergency medical care to residents and employees in case of sudden illness or accident. The policies shall include a list of those individuals to be contacted in case of an emergency. (I, II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.10(135C) Admission, transfer and discharge.

63.10(1) General admission policies.

a. Residents shall be admitted to a specialized residential care facility only on a written order signed by a primary care provider or psychiatrist, specifying the level of care, and certifying that the individual being admitted requires no more than personal care and supervision and does not require routine nursing care. (II, III)

b. No residential care facility shall admit or retain a resident who is in need of greater services than the facility can provide. (I, II, III)

c. No residential care facility shall admit more residents than the number of beds for which the facility is licensed. (II, III)

d. A residential care facility is not required to admit an individual through court order, referral or other means without the express prior approval of the administrator. (III)

e. The admission of a resident shall not grant the residential care facility the authority or responsibility to manage the personal affairs of the resident except as may be necessary for the safety of the resident and the safe and orderly management of the residential care facility as required by these rules. (III)

f. Individuals under the age of 18 shall not be admitted to a residential care facility without prior written approval by the department. A distinct part of a residential care facility, segregated from the adult section, may be established based on a résumé of care that is submitted by the licensee or applicant and is commensurate with the needs of the residents of the residential care facility and that has received the department's review and approval. (III)

g. No health care facility and no owner, administrator, employee or representative thereof shall act as guardian, trustee, or conservator for any resident's property unless such resident is related within the third degree of consanguinity to the person acting as guardian. (III)

63.10(2) Discharge or transfer.

- a. Notification shall be made to the legal representative, primary care provider, psychiatrist, if any, and sponsoring agency, if any, prior to the transfer or discharge of any resident. (III)
- b. The licensee shall not refuse to discharge or transfer a resident when the primary care provider, family, resident, or legal representative requests such transfer or discharge. (II, III)
- c. Advance notification will be made to the receiving facility prior to the transfer of any resident. (III)
- d. When a resident is transferred or discharged, the appropriate record will accompany the resident to ensure continuity of care. "Appropriate record" includes the resident's face sheet, service plan, most recent orders of the primary care provider and any notifications of upcoming scheduled appointments. (II, III)
- e. When a resident is transferred or discharged, the resident's unused prescriptions shall be sent with the resident or with a legal representative only upon the written order of a primary care provider. (II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.11(135C) Involuntary discharge or transfer.

63.11(1) *Involuntary discharge or transfer permitted.* A facility may involuntarily discharge or transfer a resident for only one of the following reasons:

- a. Medical reasons;
- b. The resident's welfare or that of other residents;
- c. Repeated refusal by the resident to participate in the resident's service plan;
- d. Due to action pursuant to Iowa Code chapter 229; or
- e. Nonpayment for the resident's stay, as described in the residency agreement for the resident's stay.

63.11(2) *Medical reasons.* Medical reasons for transfer or discharge shall be based on the resident's needs and shall be determined and documented in the resident's record by the primary care provider. Transfer or discharge may be required in order to provide a different level of care to the resident. (II)

63.11(3) *Welfare of a resident.* Welfare of a resident or that of other residents refers to a resident's social, emotional, or physical well-being. A resident may be transferred or discharged because the resident's behavior poses a continuing threat to the resident (e.g., suicidal) or to the well-being of other residents or staff (e.g., the resident's behavior is incompatible with other residents' needs and rights). Written documentation that the resident's continued presence in the facility would adversely affect the resident's own welfare or that of other residents shall be made by the administrator or designee and shall include specific information to support this determination. (II)

63.11(4) *Notice.* Involuntary transfer or discharge of a resident from a facility shall be preceded by a written notice to the resident and the responsible party. (II, III)

- a. The notice shall contain all of the following information:
 - (1) The stated reason for the proposed transfer or discharge. (II)
 - (2) The effective date of the proposed transfer or discharge. (II)
 - (3) A statement, in not less than 12-point type, that reads as follows: (II)

You have a right to appeal the facility's decision to transfer or discharge you. If you think you should not have to leave this facility, you may request a hearing, in writing or verbally, with the Iowa department of inspections and appeals (hereinafter referred to as "department") within 7 days after receiving this notice. You have a right to be represented at the hearing by an attorney or any other individual of your choice. If you request a hearing, it will be held no later than 14 days after receipt of your request by the department and you will not be transferred prior to a final decision. In emergency circumstances, extension of the 14-day requirement may be permitted upon request to the department's designee. If you lose the

hearing, you will not be transferred before the expiration of (1) 30 days following receipt of the original notice of the discharge or transfer, or (2) 5 days following final decision of such hearing, including exhaustion of all appeals, whichever occurs later. To request a hearing or receive further information, call the department at (515)281-4115, or write to the department to the attention of: Administrator, Division of Health Facilities, Department of Inspections and Appeals, Lucas State Office Building, Des Moines, Iowa 50319-0083.

b. The notice shall be personally delivered to the resident and a copy placed in the resident's record. A copy shall also be transmitted to the department; the resident's responsible party; the resident's primary care provider; and the person or agency responsible for the resident's placement, maintenance, and care in the facility. The notice shall indicate that a copy has been transmitted to the required parties by using the abbreviation "cc:" and listing the names of all parties to whom copies were sent. (II)

c. The notice required by paragraph 63.11(4) "a" shall be provided at least 30 days in advance of the proposed transfer or discharge unless one of the following occurs: (II)

(1) An emergency transfer or discharge is mandated by the resident's health care needs and is in accordance with the written orders and medical justification of the primary care provider. Emergency transfers or discharges may also be mandated in order to protect the health, safety, or well-being of other residents and staff from the resident being transferred. (II)

(2) The transfer or discharge is subsequently agreed to by the resident or the resident's responsible party, and notification is given to the responsible party, the resident's primary care provider, and the person or agency responsible for the resident's placement, maintenance, and care in the facility.

d. A hearing requested pursuant to this subrule shall be held in accordance with subrule 63.11(6).

63.11(5) *Emergency transfer or discharge.* In the case of an emergency transfer or discharge, the resident must be given a written notice prior to or within 48 hours following transfer or discharge. (II, III)

a. A copy of this notice must be placed in the resident's file. The notice must contain all of the following information:

- (1) The stated reason for the transfer or discharge. (II)
- (2) The effective date of the transfer or discharge. (II)
- (3) A statement, in not less than 12-point type, that reads: (II)

You have a right to appeal the facility's decision to transfer or discharge you on an emergency basis. If you think you should not have to leave this facility, you may request a hearing, in writing or verbally, with the Iowa department of inspections and appeals (hereinafter referred to as "department") within 7 days after receiving this notice. You have the right to be represented at the hearing by an attorney or any other individual of your choice. If you request a hearing, it will be held no later than 14 days after receipt of your request by the department. You may be transferred or discharged before the hearing is held or before a final decision is rendered. If you win the hearing, you have the right to be transferred back into the facility. To request a hearing or receive further information, call the department at (515)281-4115, or write to the department to the attention of: Administrator, Division of Health Facilities, Department of Inspections and Appeals, Lucas State Office Building, Des Moines, Iowa 50319-0083.

b. The notice shall be personally delivered to the resident and a copy placed in the resident's record. A copy shall also be transmitted to the department; the resident's responsible party; the resident's primary care provider; and the person or agency responsible for the resident's placement, maintenance, and care in the facility. The notice shall indicate that a copy has been transmitted to the required parties by using the abbreviation "cc:" and listing the names of all parties to whom copies were sent. (II)

c. A hearing requested pursuant to this subrule shall be held in accordance with subrule 63.11(6).

63.11(6) *Hearing.*

a. Request for hearing.

- (1) The resident must request a hearing within 7 days of receiving the written notice.

(2) The request must be made to the department, either in writing or verbally.

b. The hearing shall be held no later than 14 days after receipt of the request by the department unless the resident requests an extension due to emergency circumstances.

c. Except in the case of an emergency discharge or transfer, a request for a hearing shall stay a transfer or discharge pending a final decision, including the exhaustion of all appeals. (II)

d. The hearing shall be heard by a department of inspections and appeals administrative law judge pursuant to Iowa Code chapter 17A and 481—Chapter 10. The hearing shall be public unless the resident or the resident's legal representative requests in writing that the hearing be closed. In a determination as to whether a transfer or discharge is authorized, the burden of proof by a preponderance of evidence rests on the party requesting the transfer or discharge.

e. Notice of the date, time, and place of the hearing shall be sent by certified mail or delivered in person to the facility, the resident, the responsible party, and the office of the long-term care ombudsman not later than 5 full business days after receipt of the request. The notice shall also inform the facility and the resident or the responsible party that they have a right to appear at the hearing in person or be represented by an attorney or other individual. The appeal shall be dismissed if neither party is present or represented at the hearing. If only one party appears or is represented, the hearing shall proceed with one party present. A representative of the office of the long-term care ombudsman shall have the right to appear at the hearing.

f. The administrative law judge's written decision shall be mailed by certified mail to the licensee, resident, responsible party, and the office of the long-term care ombudsman within 10 working days after the hearing has been concluded.

63.11(7) *Nonpayment.* If nonpayment is the basis for involuntary transfer or discharge, the resident shall have the right to make full payment up to the date that the discharge or transfer is to be made and then shall have the right to remain in the facility. (II)

63.11(8) *Discussion of involuntary transfer or discharge.* Within 48 hours after notice of involuntary transfer or discharge has been received by the resident, the facility shall discuss the involuntary transfer or discharge with the resident, the resident's responsible party, and the person or agency responsible for the resident's placement, maintenance, and care in the facility. (II)

a. The facility administrator or other appropriate facility representative serving as the administrator's designee shall provide an explanation and discussion of the reasons for the resident's involuntary transfer or discharge. (II)

b. The content of the explanation and discussion shall be summarized in writing, shall include the names of the individuals involved in the discussion, and shall be made part of the resident's record. (II)

c. The provisions of this subrule do not apply if the involuntary transfer or discharge has already occurred pursuant to subrule 63.11(5) and emergency notice is provided within 48 hours.

63.11(9) *Transfer or discharge planning.*

a. The facility shall develop a plan to provide for the orderly and safe transfer or discharge of each resident to be transferred or discharged. (II)

b. To minimize the possible adverse effects of the involuntary transfer, the resident shall be offered counseling services by the sending facility before the involuntary transfer and by the receiving facility after the involuntary transfer. Counseling, if accepted, shall be provided by a licensed mental health professional as defined in Iowa Code section 228.1(6). Counseling shall be documented in the resident's record. (II)

c. The counseling requirement in paragraph 63.11(9)“b” does not apply if the discharge has already occurred pursuant to subrule 63.11(5) and emergency notice is provided within 48 hours.

d. The receiving health care facility of a resident involuntarily transferred shall immediately formulate and implement a plan of care which takes into account possible adverse effects the transfer may cause. (II)

63.11(10) *Transfer upon revocation of license or voluntary closure.* Residents shall not have the right to a hearing to contest an involuntary discharge or transfer resulting from the revocation of the facility's license by the department of inspections and appeals. In the case of the voluntary closure of a facility, a period of 30 days must be allowed for an orderly transfer of residents to other facilities.

63.11(11) Intrafacility transfer.

a. Residents shall not be arbitrarily relocated from room to room within a licensed health care facility. (I, II) Involuntary relocation may occur only in the following situations, which shall be documented in the resident's record: (II)

- (1) Incompatibility with or disturbing to other roommates.
- (2) For the welfare of the resident or other residents of the facility.
- (3) To allow a new admission to the facility that would otherwise not be possible due to separation of roommates by sex.
- (4) In the case of a resident whose source of payment was previously private, but who now is eligible for Title XIX (Medicaid) assistance, the resident may be transferred from a private room to a semiprivate room or from one semiprivate room to another.

(5) Reasonable and necessary administrative decisions regarding the use and functioning of the building.

b. Unreasonable and unjustified reasons for changing a resident's room without the concurrence of the resident or responsible party include:

(1) Change from private pay status to Title XIX, except as outlined in subparagraph 63.11(11)"a"(4). (II)

(2) As punishment or behavior modification, except as specified in subparagraph 63.11(11)"a"(1). (II)

(3) Discrimination on the basis of race or religion. (II)

c. If intrafacility relocation is necessary for reasons outlined in paragraph 63.11(11)"a," the resident shall be notified at least 48 hours prior to the transfer and the reason therefor shall be explained. The responsible party shall be notified as soon as possible. The notification shall be documented in the resident's record and signed by the resident or responsible party. (II, III)

d. If emergency relocation is required in order to protect the safety or health of the resident or other residents, the notification requirements may be waived. The conditions of the emergency shall be documented. The family or responsible party shall be notified immediately or as soon as possible of the condition that necessitates emergency relocation, and such notification shall be documented. (II, III)

e. A transfer to a part of a facility that has a different license must be handled the same way as a transfer to another facility, and not as an intrafacility transfer. (II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.12(135C) Residency agreement.

63.12(1) Each residency agreement shall:

a. State the base rate or scale per day or per month, the services included, and the method of payment. (III)

b. Contain a complete schedule of all offered services for which a fee may be charged in addition to the base rate. (III) Furthermore, the agreement shall:

(1) Stipulate that no further additional fees shall be charged for items not contained in the complete schedule of services; (III)

(2) State the method of payment for additional charges; (III)

(3) Contain an explanation of the method of assessment of such additional charges and an explanation of the method of periodic reassessment, if any, resulting in changing such additional charges; (III)

(4) State that additional fees may be charged to the resident for nonprescription drugs, other personal supplies, and services provided by a barber, beautician, and such. (III)

c. Contain an itemized list of services to be provided to the resident based on an assessment at the time of the resident's admission and in consultation with the administrator and including the specific fee the resident will be charged for each service and the method of payment. (III)

d. Include the total fee to be charged initially to the resident. (III)

e. State the conditions whereby the facility may make adjustments to its overall fees for resident care as a result of changing costs. (II, III) Furthermore, the agreement shall provide that the facility shall give:

(1) Written notification to the resident, or the responsible party when appropriate, of changes in the overall rates of both base and additional charges at least 30 days prior to the effective date of such changes; (II, III)

(2) Notification to the resident, or the responsible party when appropriate, of changes in additional charges, based on a change in the resident's condition. Notification must occur prior to the date such revised additional charges begin. If notification is given orally, subsequent written notification must also be given within a reasonable time, not to exceed one week, listing specifically the adjustments made. (II, III)

f. State the terms of agreement in regard to a refund of all advance payments in the event of the transfer, death, or voluntary or involuntary discharge of the resident. (II, III)

g. State the terms of agreement concerning the holding of and charging for a bed when a resident is hospitalized or leaves the facility temporarily for recreational or therapeutic reasons. The terms shall contain a provision that the bed will be held at the request of the resident or the resident's responsible party. (II, III)

(1) The facility shall ask the resident or responsible party whether the resident's bed should be held. This request shall be made before the resident leaves or within 48 hours after the resident leaves. The inquiry and the response shall be documented. (II, III)

(2) The facility shall inform the resident or responsible party that, when requested, the bed may be held beyond the number of days designated by the funding source, as long as payments are made in accordance with the agreement. (II, III)

h. State the conditions under which the involuntary discharge or transfer of a resident would be effected. (II, III)

i. Set forth any other matters deemed appropriate by the parties to the agreement. No agreement or any provision thereof shall be drawn or construed so as to relieve any health care facility of any requirement or obligation imposed upon it by this chapter or any standards or rules in force pursuant to this chapter. (II, III)

63.12(2) Each party to the residency agreement shall be provided a copy of the signed agreement. (II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.13(135C) Medical examinations.

63.13(1) Each resident in a residential care facility shall have a designated primary care provider who may be contacted when needed. (II, III)

63.13(2) Each resident admitted to a residential care facility shall have a physical examination prior to admission. (II, III)

a. If the resident is admitted directly from a hospital, a copy of the hospital admission physical and discharge summary may be a part of the record in lieu of an additional physical examination. A record of the examination, signed by the primary care provider, shall be a part of the resident's record. (II, III)

b. The record of the admission physical examination and medical history shall portray the current medical status of the resident and shall include the resident's name, sex, age, medical history, physical examination, diagnosis, statement of medical concerns, and results of any diagnostic procedures. (II, III)

c. Screening and testing for tuberculosis shall be conducted pursuant to 481—Chapter 59. (I, II, III)

63.13(3) The person in charge shall immediately notify the primary care provider of any accident, injury or adverse change in the resident's condition that has the potential for requiring further medical treatment. (I, II, III)

63.13(4) Each resident shall be visited by or shall visit the resident's primary care provider at least once each year. The one-year period shall be measured from the date of admission and does not include the resident's preadmission physical. (III)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.14(135C) Records.

63.14(1) *Resident record.* The licensee shall keep a permanent record on all residents admitted to a specialized residential care facility with all entries current, dated, and signed. (III) The record shall include:

- a. Name and previous address of resident; (III)
- b. Birth date, sex, and marital status of resident; (III)
- c. Church affiliation; (III)
- d. Primary care provider's name, telephone number, and address; (III)
- e. Dentist's name, telephone number, and address; (III)
- f. Name, address, and telephone number of next of kin or legal representative; (III)
- g. Name, address, and telephone number of person to be notified in case of emergency; (III)
- h. Mortuary's name, telephone number, and address; (III)
- i. Pharmacist's name, telephone number, and address; (III)
- j. Physical examination and medical history; (III)
- k. Certification by the primary care provider that the resident requires no more than personal care and supervision, but does not require nursing care; (III)
- l. Primary care provider's orders for medication, treatment, and diet in writing and signed by the primary care provider; (III)
- m. A notation of yearly or other visits to primary care provider or other professional services; (III)
- n. Any change in the resident's condition; (II, III)
- o. If the primary care provider has certified that the resident is capable of taking prescribed medications, the resident shall be required to keep the administrator advised of current medications, treatments, and diet. The administrator shall keep a listing of medication, treatments, and diet prescribed by the primary care provider for each resident; (III)
- p. If the primary care provider has certified that the resident is not capable of taking prescribed medication, it must be administered by a qualified person of the facility. A qualified person shall be defined as either a registered or licensed practical nurse or an individual who has completed the state-approved training course in medication administration, including a medication manager or certified medication aide; (II)
- q. Medications administered by an employee of the facility shall be recorded on a medication record by the individual who administers the medication; (II, III)
- r. A notation describing the resident's condition on admission, transfer, and discharge; (III)
- s. In the event of a resident's death, notations in the resident's record shall include the date and time of the resident's death, the circumstances of the resident's death, the disposition of the resident's body, and the date and time that the resident's family and primary care provider were notified of the resident's death; (III)
- t. A copy of instructions given to the resident, legal representative, or facility in the event of discharge or transfer; (III)
- u. Disposition of valuables; (III)
- v. Current individual program plans. (II, III)

63.14(2) *Confidentiality of resident records.*

a. Each resident shall be ensured confidential treatment of all information contained in the resident's records. The resident's written consent shall be required for the release of information to persons not otherwise authorized under law to receive it. (II)

b. The facility shall limit access to any medical records to staff and consultants providing professional service to the resident. This is not meant to preclude access by representatives of state and federal regulatory agencies. (II)

c. Similar procedures shall safeguard the confidentiality of residents' personal records, e.g., financial records and social services records. Only those personnel concerned with the financial affairs of the residents may have access to the financial records. This is not meant to preclude access by representatives of state and federal regulatory agencies. (II)

d. The resident or the resident's responsible party shall be entitled to examine all information contained in the resident's record and shall have the right to secure full copies of the record at reasonable cost upon request, unless the primary care provider determines the disclosure of the record or section thereof is contraindicated in which case this information will be deleted before the record is made available to the resident or responsible party. This determination and the reasons for it must be documented in the resident's record. (II)

63.14(3) Incident record.

a. Each residential care facility shall maintain an incident record report and shall have available incident report forms. (II, III)

b. Report of incidents shall be in detail on an incident report form. (III)

c. The person in charge at the time of the incident shall oversee the preparation of and sign the incident report. The administrator or designee shall review, sign and date the incident report within 72 hours of the accident, incident or unusual occurrence. (II, III)

d. An incident report shall be completed for every accident or incident where there is apparent injury or where an injury of unknown origin may have occurred. (II)

e. An incident report shall be completed for every accident, incident or unusual occurrence within the facility or on the premises that affects a resident, visitor, or employee. (II, III)

f. A copy of the incident report shall be kept on file in the facility. (II, III)

63.14(4) Retention of records.

a. Records shall be retained in the facility for five years following the termination of services to a resident. (III)

b. Records shall be retained within the facility upon change of ownership. (III)

c. When the facility ceases to operate, a copy of the resident's record shall be released to the facility to which the resident is transferred. (III)

d. When the facility ceases to operate, records shall be maintained for five years in a clean, dry secured storage area. (III)

63.14(5) Electronic records. In addition to the access provided in 481—subrule 50.10(2), an authorized representative of the department shall be provided unrestricted access to electronic records pertaining to the care provided to the residents of the facility. (II, III)

a. If access to an electronic record is requested by the authorized representative of the department, the facility may provide a tutorial on how to use its particular electronic system or may designate an individual who will, when requested, access the system, respond to any questions or assist the authorized representative as needed in accessing electronic information in a timely fashion. (II, III)

b. The facility shall provide a terminal where the authorized representative may access records. (II, III)

c. If the facility is unable to provide direct print capability to the authorized representative, the facility shall make available a printout of any record or part of a record on request in a time frame that does not intentionally prevent or interfere with the department's survey or investigation. (II, III)

63.14(6) Reports to the department. The licensee shall furnish statistical information concerning the operation of the facility to the department on request. (III)

63.14(7) Personnel record.

a. Personnel records for each employee shall be kept in accordance with subrule 63.8(4). (III)

b. The personnel records shall be made available for review upon request by the department. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.15(135C) Resident care and personal services.

63.15(1) A complete change of bed linens shall be provided at least once a week and more often if necessary. (III)

63.15(2) Residents shall receive sufficient supervision to promote personal cleanliness. (II, III)

63.15(3) Residents shall have clean clothing as needed. Clothing shall be appropriate to residents' activities and to the weather. (III)

63.15(4) Residents shall be encouraged to bathe at least twice a week. (II, III)

63.15(5) All nonambulatory residents shall be housed on the grade level floor unless the facility has a suitably sized elevator. (II)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.16(135C) Drugs.

63.16(1) Drug storage.

a. Residents who have been certified in writing by their primary care provider as capable of taking their own medications may retain these medications in their bedroom, but locked storage must be provided, with staff and the resident having access, and the drug storage shall be kept locked when not in use. Monitoring of the storage, administration, and documentation by the resident shall be carried out by a person who meets the requirements of subrule 63.16(3) and is responsible for administering medications. (II, III)

b. Drug storage for residents who are unable to take their own medications and require supervision shall meet the following requirements:

(1) Locked storage for drugs, solutions, and prescriptions shall be provided. (III)

(2) A bathroom shall not be used for drug storage. (III)

(3) The drug storage shall be kept locked when not in use. (III)

(4) The drug storage key shall be secured and available only to those employees charged with the responsibility of administering medications. (II, III)

(5) Schedule II drugs, as defined by Iowa Code chapter 124, shall be kept in a locked box within the locked drug storage. (II, III)

(6) Medications requiring refrigeration shall be kept locked in a refrigerator and separated from food and other items. (II, III)

(7) Drugs for external use shall be stored separately from drugs for internal use. (II, III)

(8) All potent, poisonous, or caustic materials shall be stored separately from drugs, shall be plainly labeled and stored in a specific, well-illuminated cabinet, closet, or storeroom, and shall be made accessible only to authorized persons. (I, II)

(9) Inspection of drug storage shall be made by the administrator or designee and a registered pharmacist not less than once every three months. The inspection shall be verified by a report signed by the administrator and the pharmacist and filed with the administrator. The report shall include, but not be limited to, certification of the absence of the following: expired drugs, deteriorated drugs, improper labeling, drugs for which there is no current primary care provider's order, and drugs improperly stored. (III)

(10) Bulk supplies of prescription drugs for multiresident use shall not be kept in a residential care facility. (III)

63.16(2) Drug safeguards.

a. All prescribed medications shall be clearly labeled indicating the resident's full name, primary care provider's name, prescription number, name and strength of drug, dosage, directions for use, date of issue, and name and address and telephone number of pharmacy or primary care provider issuing the drug. Where unit dose is used, prescribed medications shall, at a minimum, indicate the resident's full name, primary care provider's name, name and strength of drug, and directions for use. Standard containers shall be utilized for dispensing drugs. (III)

b. Sample medications provided by the resident's primary care provider shall clearly identify to whom the medications belong. (III)

c. Medication containers having soiled, damaged, illegible, or makeshift labels shall be returned to the issuing pharmacist, pharmacy, or primary care provider for relabeling or disposal. (III)

d. The medication for each resident shall be kept or stored in the original containers unless the resident is participating in an individualized medication program. (II, III)

e. Unused prescription drugs shall be destroyed by the person in charge, in the presence of a witness, and with a notation made on the resident's record or shall be returned to the supplying pharmacist. (III)

f. Prescriptions shall be refilled only with the permission of the resident's primary care provider. (II, III)

g. Medications prescribed for one resident shall not be administered to or allowed in the possession of another resident. (I, II)

h. Instructions shall be requested from the Iowa board of pharmacy concerning disposal of unused Schedule II drugs prescribed for a resident who has died or for whom the Schedule II drug was discontinued. (III)

i. Discontinued medications shall be destroyed within a specified time by a responsible person, in the presence of a witness, and with a notation made to that effect or shall be returned to the pharmacist for destruction. Drugs listed under the Schedule II drugs shall be destroyed in accordance with the requirements established by the Iowa board of pharmacy. (II, III)

j. All medication orders which do not specifically indicate the number of doses to be administered or the length of time the drug is to be administered shall be stopped automatically after a given time period. The automatic-stop order may vary for different types of drugs. The resident's primary care provider, in conjunction with the pharmacist, shall institute these policies and provide procedures for review and endorsement. (II, III)

k. No resident shall be allowed to possess any medications unless the primary care provider has certified in writing on the resident's medical record that the resident is mentally and physically capable of doing so. (II)

l. No medications or prescription drugs shall be administered to a resident without a written order signed by the primary care provider. (II)

m. The facility shall establish a policy to govern the distribution of prescribed medications to residents who are on leave from the facility. (II, III)

(1) Medications may be issued to residents who will be on leave from a facility for less than 24 hours. Only those medications needed for the time period that the resident will be on leave from the facility may be issued. Non-child-resistant containers may be used. Instructions shall be provided and include the date, the resident's name, the name of the facility, and the name of the medication, its strength, dose and time of administration. (II, III)

(2) Medication for residents on leave from a facility for longer than 24 hours shall be obtained in accordance with requirements established by the Iowa board of pharmacy. (II, III)

(3) Medication for residents on leave from a facility may be issued only by facility personnel responsible for administering medication. (II, III)

63.16(3) Drug administration—authorized personnel.

a. A properly trained person shall be charged with the responsibility of administering medications as ordered by a primary care provider. (II, III)

b. The person shall have knowledge of the purpose of the drugs and their dangers and contraindications. (II, III)

c. The person shall be a licensed nurse or primary care provider or an individual who has completed the state-approved training course in medication administration, including a medication manager or certified medication aide. (II, III)

d. Prior to taking a department-approved medication aide course, the person shall:

(1) Successfully complete an approved residential aide course, nurse aide course, nurse aide training and testing program or nurse aide competency examination; (III)

(2) Have a letter of recommendation for admission to the medication aide course from the employing facility. (III)

e. A person who is a nursing student or a graduate nurse may take the medication aide challenge examination in place of taking a course. The person shall do all of the following before taking the challenge examination:

(1) Complete a clinical or nursing theory course within six months before taking the challenge examination; (III)

(2) Successfully complete a nursing program pharmacology course within one year before taking the challenge examination; (III)

(3) Provide to the community college a written statement from the nursing program's pharmacology or clinical instructor indicating that the person is competent in medication administration. (III)

f. A person who has written documentation of certification as a medication aide in another state may become a medication aide in Iowa by successfully completing a department-approved nurse aide competency examination and a medication aide challenge examination. The requirements of paragraph 63.16(3)“*d*” do not apply to this person. (III)

63.16(4) Drug administration.

a. Unless the unit dose system is used, the person assigned the responsibility of medication administration must complete the procedure by personally preparing the dose, observing the actual act of swallowing the oral medication, and charting the medication. In facilities where the unit dose system is used, the person assigned the responsibility of medication administration must complete the procedure by observing the actual act of swallowing the oral medication and by charting the medication. Medications shall be prepared on the same shift of the same day that they are administered unless the unit dose system is used. (II)

b. Injectable medications shall be administered as permitted by Iowa law by a registered nurse, licensed practical nurse, primary care provider or pharmacist. For purposes of this subrule, “injectable medications” does not include an epinephrine autoinjector, e.g., an EpiPen. (II, III)

c. A resident certified by the resident's primary care provider as capable of injecting the resident's own insulin may do so. Insulin may be administered pursuant to paragraph 63.16(4)“*b*” or as otherwise authorized by the resident's primary care provider. (II, III) Authorization shall:

- (1) Be in writing,
- (2) Be maintained in the resident's record,
- (3) Be renewed quarterly,
- (4) Include the name of the person authorized to administer the insulin,
- (5) Include documentation by the primary care provider that the authorized person is qualified to administer insulin to that resident. (II, III)

d. A resident may participate in the administration of the resident's own medication if the primary care provider has certified in writing in the resident's medical record that the resident is mentally and physically capable of participating and has explained in writing in the resident's medical record what the resident's participation may include.

e. An individual inventory record shall be maintained for each Schedule II drug prescribed for each resident, with an accurate count and authorized signatures at every shift. (II)

f. The facility may use a unit dose system.

g. Medication aides and medication managers may administer PRN medications without contacting a licensed nurse or primary care provider if all of the following apply: (I, II, III)

(1) A written order from the resident's primary care provider specifies the purpose of the PRN medication and the frequency, dosage and strength of the PRN medication.

(2) The resident's primary care provider provides in writing specific criteria for administering PRN medications.

(3) The pharmacist assesses the resident's use of PRN medications when conducting the inspection of drug storage as required by subparagraph 63.16(1)“*b*”(9).

h. The pharmacist shall assess the use of PRN medications when conducting the inspection of drug storage as required by subparagraph 63.16(1)“*b*”(9). (II, III)

i. Medications administered by an employee of the facility shall be recorded on a medication record by the individual who administers the medication. (I, II, III)

481—63.17(135C) Dental services.

63.17(1) The residential care facility personnel shall assist residents in obtaining annual and emergency dental services and shall arrange transportation for such services. (III)

63.17(2) Dental services shall be performed only on the request of the resident, responsible party, legal representative, or primary care provider. The resident's primary care provider shall be advised of the resident's dental problems. (III)

63.17(3) All dental reports or progress notes shall be included in the resident record as available. The facility shall make reasonable efforts to obtain the records following the provision of services. (III)

63.17(4) Personal care staff shall assist the resident in carrying out the dentist's recommendations. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.18(135C) Dietary.

63.18(1) Dietary staffing. Personnel who are responsible for food preparation or service, or both food preparation and service, shall have an orientation on sanitation and safe food handling prior to handling food and shall have annual in-service training on food protection. (III)

63.18(2) Nutrition and menu planning.

a. Menus shall be planned and followed to meet the nutritional needs of residents in accordance with the primary care provider's orders. Diet orders should be reviewed as necessary, but at least quarterly, by the primary care provider. (II, III)

b. In facilities where residents plan and prepare their own meals, education and support shall be provided to residents regarding proper food preparation, dietary guidelines, and food safety.

c. In facilities where food is regularly prepared for residents, the following shall apply:

(1) Menus shall be planned and served to include foods and amounts necessary to meet federal dietary guidelines. (II, III)

(2) At least three meals or their equivalent shall be offered daily, at regular hours. (II, III)

1. There shall be no more than a 14-hour span between offering a substantial evening meal and breakfast. (II, III)

2. Unless contraindicated, evening snacks shall be offered routinely to all residents. Special nourishments shall be available when ordered by the primary care provider. (II, III)

(3) Menus shall include a variety of foods prepared in various ways. (III)

(4) Menus shall be written at least one week in advance. The current menu shall be located in an accessible place for easy use by persons purchasing, preparing, and serving food. (III)

(5) Records of menus as served shall be filed and maintained for 30 days and shall be available for review by departmental personnel. When substitutions are necessary or requested, they shall be of similar nutritive value and recorded on the menu or in a notebook. (III)

(6) The facility shall provide an alternative choice at scheduled meal times. (III)

63.18(3) Dietary storage, food preparation, and service.

a. All food shall be handled, prepared, served and stored in compliance with the Food Code adopted pursuant to Iowa Code section 137F.2. (I, II, III)

b. Supplies of staple foods for a minimum of a one-week period and of perishable foods for a minimum of a two-day period shall be maintained on the premises. Minimum food portion requirements for a low-cost plan shall conform to information supplied by the bureau of nutrition and health promotion of the department of public health. (II, III)

c. Dishes shall be free of cracks, chips, and stains. (III)

d. If family-style service is used, all leftover prepared food that has been on the table shall be properly handled. (III)

63.18(4) Sanitation in food preparation area. There shall be written procedures established for cleaning all work and serving areas. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.19(135C) Orientation and service plan.

63.19(1) Orientation. Within 24 hours of admission, each resident shall receive orientation to the facility. The orientation program shall be documented in the resident's file and shall include, but shall not be limited to, a review of the resident's rights, the daily schedule, house rules and the facility's evacuation plan. (II, III)

63.19(2) Initial service plan. Within 48 hours of admission, the administrator or the administrator's designee shall develop an initial service plan to address any immediate health and safety needs. The plan shall be based on information gathered from the resident, family, referring party, primary care provider, and other significant persons. The plan shall be followed until the service plan required in subrule 63.19(3) is complete. (I, II, III)

63.19(3) Service plan. Within 30 days of admission, the administrator or the administrator's designee, in conjunction with the resident and the resident's interdisciplinary team, shall develop a written, individualized, and integrated service plan for the resident. The service plan shall be developed and implemented to address the resident's priorities and assessed needs, such as activities of daily living, rehabilitation, activity, and social, behavioral, emotional, physical and mental health. (I, II, III)

a. The service plan shall include measurable goals and objectives and the specific service(s) to be provided to achieve the goals. Each goal shall include the date of initiation and anticipated duration of service(s). Any restriction of rights shall be included in the service plan. (I, II, III)

b. The service plan shall include the documentation procedure for each goal and objective. (II, III)

c. The service plan should be modified to add or delete goals and objectives as the resident's needs change. Communications related to service plan changes or changes in the resident's condition shall occur within five working days of the change and shall be conveyed to all individuals inside and outside the residential care facility who work with the resident, as well as to the resident's responsible party. (I, II, III)

d. The service plan shall be reviewed at least quarterly by relevant staff, the resident and appropriate others, such as the resident's family, case manager and responsible party. The review shall include a written report which addresses a summary of the resident's progress toward goals and objectives and the need for continued services. (I, II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.20(135C) Resident activities program.

63.20(1) Activities program. Each residential care facility shall provide suitable group and individual activities for residents. (III)

a. The activities provided shall be designed to meet the needs and interests of each resident and to assist residents in continuing normal activities within limitations set by the resident's primary care provider. This shall include helping residents continue in their individual interests or hobbies. (III)

b. Residents shall be encouraged, but not required, to participate in activities. (III)

63.20(2) Each resident may participate in activities of social, religious, and community groups at the resident's discretion unless contraindicated for reasons documented by the primary care provider or interdisciplinary team as appropriate in the resident's record. (II)

63.20(3) Residents who wish to meet with or participate in activities of social, religious, or other community groups in or outside of the facility shall be informed, encouraged, and assisted to do so. (II)

63.20(4) Supplies, equipment, and storage.

a. Each facility shall provide a variety of supplies and equipment of a nature calculated to fit the needs and interests of the residents. (III)

b. Storage shall be provided for recreational equipment and supplies. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.21(135C) Residents' rights.

63.21(1) Each facility shall ensure that policies and procedures are written and implemented which include, at a minimum, the provisions of this rule and which govern all areas of service provided by the

facility. These policies and procedures shall be available to staff, residents, residents' families or legal representatives and the public and shall be reviewed annually. (II, III)

63.21(2) Policies and procedures shall include a method for submitting complaints and recommendations by residents or their responsible parties and for ensuring a response and disposition by the facility. (II, III) The written procedures shall:

a. Ensure the provision of assistance to residents as necessary to complete and submit complaints and recommendations; (II, III)

b. Ensure protection of the resident from any form of reprisal or intimidation; (II, III)

c. Include designation of an employee responsible for handling grievances and recommendations; (II, III)

d. Include a method of investigating and assessing the validity of a grievance or recommendation; (II, III) and

e. Include methods of recording grievances and actions taken. (II, III)

63.21(3) Policies and procedures shall include provisions governing access to, duplication of, and dissemination of information from the residents' records. (II, III)

63.21(4) Policies and procedures shall include a provision that each resident shall be fully informed of the resident's rights and responsibilities as a resident and of all rules governing resident conduct and responsibilities. This information must be provided upon the resident's admission or, in the case of residents already in the facility, upon the facility's adoption or amendment of residents' rights policies. (II, III)

a. The facility shall communicate to residents prior to or within five days after admission what residents may expect from the facility and its staff and what is expected from residents. The communication shall be in writing, e.g., in a separate handout or brochure describing the facility, and interpreted verbally, e.g., as part of a preadmission interview, resident counseling, or in individual or group orientation sessions following the resident's admission. (II, III)

b. Residents' rights and responsibilities shall be presented in language understandable to the resident. If the facility serves residents who are non-English-speaking or deaf, steps shall be taken to translate the information into a foreign or sign language. In the case of blind residents, either Braille or a recording shall be provided. Residents shall be encouraged to ask questions about their rights and responsibilities, and these questions shall be answered. (II, III)

c. A statement shall be signed by the resident, or the resident's responsible party if applicable, indicating an understanding of these rights and responsibilities and shall be maintained in the resident's record. The statement shall be signed no later than five days after admission, and a copy of the signed statement shall be given to the resident or responsible party. (II, III)

d. In order to ensure that residents continue to be aware of these rights and responsibilities during their stay, a written copy shall be prominently posted in a location that is available to all residents. (II, III)

e. All residents shall be advised within 30 days following changes made in the statement of residents' rights and responsibilities. Appropriate means shall be utilized to inform non-English-speaking, deaf or blind residents of changes. (II, III)

63.21(5) Choice of primary care provider. Each resident shall be permitted free choice of a primary care provider, and pharmacy, if accessible. The facility may require the selected pharmacy to utilize a drug distribution system compatible with the system currently used by the facility. (II)

63.21(6) Each resident shall be afforded the opportunity to participate in the planning of the resident's total care and treatment, which may include, but shall not be limited to, medical care, nutritional needs, activities, and social work services. Each resident has the right to refuse treatment except as provided by Iowa Code chapter 229. In the case of a resident with a responsible party, the responsible party shall be afforded the opportunity to participate in the planning of the resident's total care and medical treatment and to be informed of the resident's medical condition. (II, III)

63.21(7) Each resident shall be encouraged and assisted throughout the resident's period of stay to exercise the resident's rights as a resident and as a citizen and may voice grievances and recommend

changes in policies and services to administrative staff or to outside representatives of the resident's choice, free from interference, coercion, discrimination, or reprisal. (II)

63.21(8) The facility shall provide ongoing opportunities for residents to be aware of and to exercise their rights as residents. Residents shall be kept informed of changes in policies and services that are more restrictive, and their views shall be solicited prior to action. (II)

63.21(9) The facility shall post in a prominent area the text of Iowa Code section 135C.46 (Retaliation by facility prohibited) and the name, telephone number, and address of the long-term care ombudsman, the department, and the local law enforcement agency to provide residents a further course of redress. (II)

63.21(10) All rights and responsibilities of the resident devolve to the resident's responsible party or any legal surrogate designated in accordance with state law, to the extent permitted by state law. This subrule is not intended to limit the authority of any individual acting pursuant to Iowa Code chapter 144A. (II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.22(135C) Dignity preserved. The resident shall be treated with consideration, respect, and full recognition of dignity and individuality, including privacy in treatment and in care for personal needs. (I, II)

63.22(1) Staff shall display respect for residents when speaking with, caring for, or talking about them, as constant affirmation of their individuality and dignity as human beings. (I, II)

63.22(2) Schedules of daily activities shall allow maximum flexibility for residents to exercise choice about what they will do and when they will do it. Residents' individual preferences regarding such things as menus, clothing, religious activities, friendships, activity programs, entertainment, sleeping and eating, also times to retire at night and arise in the morning shall be elicited and considered by the facility. (II)

63.22(3) Residents shall be examined and treated in a manner that maintains the privacy of their bodies. A closed door or a drawn curtain shall shield the resident from passersby. People not involved in the care of the residents shall not be present without the resident's consent while the resident is being examined or treated. (II)

63.22(4) Privacy of a resident's body also shall be maintained during toileting, bathing, and other activities of personal hygiene, except as needed for resident safety or assistance. (II)

63.22(5) Staff shall knock and be acknowledged before entering a resident's room unless the resident is not capable of a response. This shall not apply under emergency conditions. (II)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.23(135C) Communications. Each resident may communicate, associate, and meet privately with persons of the resident's choice, unless to do so would infringe upon the rights of other residents, and may send and receive personal mail unopened. (II)

63.23(1) Subject to reasonable scheduling restrictions, visiting policies and procedures shall permit residents to receive visits from anyone they wish. Visiting hours shall be posted. (II)

63.23(2) Reasonable, regular visiting hours shall not be less than 12 hours per day and shall take into consideration the special circumstances of each visitor. A particular visitor(s) may be restricted by the facility for one of the following reasons:

- a. The resident refuses to see the visitor(s). (II)
- b. The resident's primary care provider documents specific reasons why such a visit would be harmful to the resident's health. (II)
- c. The visitor's behavior is unreasonably disruptive to the functioning of the facility. This judgment must be made by the administrator, and the reasons shall be documented and kept on file. (II)

63.23(3) Decisions to restrict a visitor are reviewed and reevaluated:

- a. Each time the medical orders are reviewed by the primary care provider;
- b. At least quarterly by the facility's staff; or
- c. At the resident's request. (II)

63.23(4) Space shall be provided for residents to receive visitors in reasonable comfort and privacy. (II)

63.23(5) Telephones shall be available and accessible for residents to make and receive calls with privacy. Residents who need help shall be assisted in using the telephone. (II)

63.23(6) Arrangements shall be made to provide assistance to residents who require help in reading or sending mail. (II)

63.23(7) Residents, including residents court-ordered to the facility, shall be permitted to leave the facility at reasonable times unless there are justifiable reasons established in writing by court order, the primary care provider, the interdisciplinary team, or the facility administrator for refusing permission. (II)

63.23(8) Residents shall not have their personal lives regulated beyond reasonable adherence to meal schedules, bedtime hours, and other written policies which may be necessary for the orderly management of the facility and as required by these rules. However, residents shall be encouraged to participate in recreational programs. (II)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.24(135C) Resident property.

63.24(1) Residents shall be permitted to keep reasonable amounts of personal clothing and possessions for their use while in the facility. The facility shall offer the resident the opportunity to have personal property itemized and documented on an inventory sheet upon the resident's admission. The inventory sheet shall be kept in a safe location which is convenient for the resident to review and update. At discharge, residents may sign off on a list of the personal property they are taking with them. (II, III)

63.24(2) The facility shall provide for the safekeeping of personal effects, funds and other property of its residents. The facility may require that items of exceptional value or that would convey unreasonable responsibilities to the licensee be removed from the premises of the facility for safekeeping. (III)

63.24(3) Any funds or other property belonging to or due a resident, or expendable for the resident's account, which is received by the facility shall be trust funds; shall be kept separate from the funds and property of the facility and of its other residents, or specifically credited to such resident; and shall be used or otherwise expended only for the account of the resident. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.25(135C) Financial affairs—management. Each resident who has not been assigned a guardian or conservator by the court may manage the resident's own personal financial affairs. To the extent the facility assists in management, under written authorization by the resident, the management shall be carried out in accordance with Iowa Code section 135C.24. (II)

63.25(1) The facility shall maintain a written account of all residents' funds received by or deposited with the facility. (II)

63.25(2) An employee shall be designated in writing to be responsible for resident accounts. (II)

63.25(3) The facility shall keep on deposit personal funds over which the resident has control in accordance with Iowa Code section 135C.24. Should the resident request these funds, they shall be given to the resident on request with receipts maintained by the facility and a copy to the resident. In the case of a resident with impaired decision-making skills, the resident's legal representative shall designate a method of disbursing the resident's funds. (II)

63.25(4) If the facility makes financial transactions on a resident's behalf, the facility must document that it has prepared and sent an itemized accounting of disbursements and current balances at least quarterly. A copy of this statement shall be maintained in the resident's financial or business record. (II)

63.25(5) A resident's personal funds shall not be used without the written consent of the resident or the resident's legal representative. (I, II)

63.25(6) A resident's personal funds shall be returned to the resident when the funds have been used without the written consent of the resident or the resident's legal representative. The department

may report findings that resident funds have been used without written consent to the department's investigations division or to the local law enforcement agency, as appropriate. (II)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.26(135C) Resident work. No resident may be required to perform services for the facility, except as provided by Iowa Code section 347B.5. (II)

63.26(1) Residents may not be used to provide a source of labor for the facility against their will. Approval by the primary care provider or psychiatrist is required for all work programs. (I, II)

63.26(2) Residents who perform work for the facility must receive compensation unless the work is part of their approved training program. Persons on the resident census who perform work shall not be used to replace paid employees in fulfilling staffing requirements. (II)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.27(135C) Resident abuse prohibited. Each resident shall receive kind and considerate care at all times and shall be free from mental, physical, sexual, and verbal abuse, exploitation, neglect, and physical injury. (I, II)

63.27(1) Mental abuse includes, but is not limited to, humiliation, harassment, and threats of punishment or deprivation. (I, II)

63.27(2) Physical abuse includes, but is not limited to, corporal punishment and the use of restraints as punishment. (I, II)

63.27(3) Drugs such as tranquilizers shall only be used in accordance with orders of the primary care provider. (I, II)

63.27(4) Allegations of dependent adult abuse. Allegations of dependent adult abuse shall be reported and investigated pursuant to Iowa Code chapter 235E and 481—Chapter 52. (I, II, III)

63.27(5) Staff shall receive training relating to the identification and reporting of dependent adult abuse as required by Iowa Code section 235B.16. (I, II, III)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.28(135C) Crisis intervention. If a facility utilizes physical restraints, the facility shall have written policies that define the uses of physical restraints, designate the administrator or designee as the person who may authorize their use, establish a mechanism for monitoring and controlling their use, and provide staff with proper training. (I, II)

63.28(1) Temporary physical restraint of residents shall be used only under the following conditions: (I, II)

a. An emergency to prevent injury to the resident or to others; or (I, II)

b. For crisis intervention, but shall not be used for punishment, for the convenience of staff or as a substitution for supervision or programming; (I, II) and

c. No staff person shall use any restraint that obstructs the airway of the resident. (I, II)

63.28(2) Authorization for the use of physical restraints must be prior to or immediately after application of the restraint. (I, II)

63.28(3) Prone restraint is prohibited. Staff persons who find themselves involved in the use of a prone restraint when responding to an emergency must take immediate steps to end the prone restraint. (I, II)

63.28(4) The rationale and authorization for the use of physical restraint and staff action and procedures carried out to protect the resident's rights and to ensure safety shall be clearly set forth in the resident's record by the responsible staff persons. (I, II)

63.28(5) The primary care provider, the interdisciplinary team and the resident's responsible party shall be notified of any restraints administered. (I, II, III)

63.28(6) The facility shall provide to the staff a department-approved training program by qualified professionals on physical restraint techniques. (I, II)

a. The facility shall keep a record of training for review by the department and shall include attendance. (II, III)

b. Only staff with documented training in physical restraint and techniques shall be authorized to assist with physical restraint of a resident. (I, II)

c. Under no circumstances shall a resident be allowed to actively or passively assist in the restraint of another resident. (I, II)

63.28(7) Residents shall not be kept behind locked doors. (I, II)

63.28(8) Mechanical restraint is prohibited. Staff persons who find themselves involved in the use of a mechanical restraint when responding to an emergency must take immediate steps to end the mechanical restraint. (I, II)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.29(135C) Safety. The licensee of a residential care facility shall be responsible for the provision and maintenance of a safe environment for residents and personnel. (I, II, III)

63.29(1) Fire safety.

a. All residential care facilities shall meet the fire safety rules and regulations as promulgated by the state fire marshal. (I, II)

b. The size of the facility and needs of the residents shall be taken into consideration in evaluating safety precautions and practices.

63.29(2) Safety duties of administrator. The administrator shall have a written emergency plan to be followed in the event of fire, tornado, explosion, or other emergency. (III)

a. The plan shall be prominently posted in a common area of the building. (III)

b. In-service shall be provided to ensure that all employees are knowledgeable of the emergency plan. (II, III)

63.29(3) Resident safety.

a. Smoking shall be prohibited, except as allowed by Iowa Code chapter 142D, the smokefree air Act. (II, III)

b. Whenever full or empty tanks of oxygen are being used or stored, they shall be securely supported in an upright position. (II, III)

c. Residents shall receive adequate supervision to ensure against hazard from themselves, others, or elements in the environment. (I, II, III)

d. Storage areas for cleaning agents, bleaches, insecticides, or any other poisonous, dangerous, or flammable materials shall be locked. Residents permitted to access these materials shall have an order by their primary care provider stating the resident is able to utilize such materials, and staff shall supervise the residents as identified in the resident's service plan. (I, II, III)

e. Sufficient numbers of noncombustible trash containers with covers shall be available. (III)

f. Residents' personal possessions that may constitute a hazard to residents or others shall be removed and stored. (III)

63.29(4) First-aid kit. A first-aid emergency kit shall be available on each floor in every facility. (II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.30(135C) Housekeeping.

63.30(1) Each resident room shall be cleaned on a routine schedule. (III)

63.30(2) All rooms, corridors, storage areas, linen closets, attics, and basements shall be kept in a clean, orderly condition, free of unserviceable furniture and equipment and accumulations of refuse. (II, III)

63.30(3) A hallway or corridor shall not be used for storage of equipment. (II, III)

63.30(4) All odors shall be kept under control by cleanliness and proper ventilation. (III)

63.30(5) Clothing worn by personnel shall be clean and washable. (III)

63.30(6) All furniture, bedding, linens, and equipment shall be cleaned periodically and before use by another resident. (II, III)

63.30(7) Polishes used on floors shall provide a nonslip finish. (II, III)

63.30(8) Throw or scatter rugs shall have nonskid backing. (II, III)

63.30(9) Entrances, exits, steps, and outside walkways shall be kept free from ice, snow, and other hazards. (II, III)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.31(135C) Maintenance.

63.31(1) The building, grounds, and other buildings shall be maintained in a clean, orderly condition and in good repair. (II, III)

63.31(2) Window treatments and furniture shall be clean and in good repair. (II, III)

63.31(3) Cracks in plaster, peeling wallpaper or paint, and tears or splits in floor coverings shall be promptly repaired or replaced in a professional manner. (II, III)

63.31(4) The electrical systems, including appliances, cords, and switches, shall be maintained to guarantee safe functioning and comply with the National Electric Code. (II, III)

63.31(5) All plumbing fixtures shall function properly and comply with the state plumbing code. (II, III)

63.31(6) Yearly inspections of the heating and cooling systems shall be made to guarantee safe operation. (II, III)

63.31(7) The building, grounds, and other buildings shall be kept free of breeding areas for flies, other insects, and rodents. (II, III)

63.31(8) The facility shall be kept free of flies, other insects, and rodents. (II, III)
[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.32(135C) Laundry.

63.32(1) Residents' personal laundry shall be marked with an identification if commingled with other residents' personal laundry. (III)

63.32(2) Bed linens, towels, and washcloths shall be clean and stain-free. (III)

63.32(3) If laundry is done in the facility, a clean, dry, well-lit area to accommodate a washer and dryer of adequate size to serve the needs of the facility shall be provided. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.33(135C) Garbage and waste disposal.

63.33(1) All garbage shall be gathered, stored, and disposed of in a manner that will not permit transmission of disease, create a nuisance, or provide a breeding or feeding place for vermin or insects. (III)

63.33(2) All containers for refuse shall be watertight and rodent-proof and have tight-fitting covers. (III)

63.33(3) All unlined containers inside of the facility shall be thoroughly cleaned each time the containers are emptied. (III)

63.33(4) All waste shall be properly disposed of in compliance with local ordinances and state codes. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.34(135C) Supplies.

63.34(1) Linen supplies.

a. There shall be an adequate supply of linens so that each resident shall have at least three washcloths, hand towels, and bath towels per week. (III)

b. A complete change of bed linens shall be available in the linen storage area for each bed. (III)

c. Sufficient lightweight, clean, serviceable blankets shall be available. All blankets shall be laundered as often as necessary for cleanliness and freedom from odors. (III)

d. Each bed shall be provided with clean, washable bedspreads. There shall be a supply available when changes are necessary. (III)

e. Adequate storage shall be provided for linens, pillows, and bedding. (III)

63.34(2) Supplies, equipment and storage.

a. All equipment shall be properly cleaned and sanitized before use by another resident. (III)

- b. Clean and sanitary storage shall be provided for equipment and supplies. (III)
 - c. Locked storage should be available for potentially dangerous items such as scissors, knives, and toxic materials. (III)
- [ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.35(135C) Buildings, furnishings, and equipment.

63.35(1) Buildings—general requirements.

- a. All windows shall be supplied with window treatments that are kept clean and in good repair. (III)
- b. Whenever glass sliding doors or transparent panels are used, they shall be marked conspicuously. (III)
- c. The facility shall meet the equivalent requirements of the appropriate group occupancy of the state building code. (III)

63.35(2) Furnishings and equipment.

- a. All furnishings and equipment shall be durable, cleanable, and appropriate to their function. (III)
- b. All resident areas shall be decorated, painted, and furnished to provide a homelike atmosphere. (III)

63.35(3) Dining areas and living rooms.

- a. Living rooms shall be maintained for the use of residents and their visitors and may be used for recreational activities. Living rooms shall be suitably furnished. (III)
- b. Dining areas shall be furnished with dining tables and chairs appropriate to the size and function of the facility. Dining rooms and furnishings shall be kept clean and sanitary. (III)

63.35(4) Bedrooms.

- a. Each resident shall be provided with a standard, single, or twin bed, substantially constructed and in good repair. Rollaway beds, metal cots, or folding beds are not acceptable. (III)
- b. Each bed shall be equipped with the following: casters or glides; clean springs in good repair; a clean, comfortable, well-constructed mattress approximately five inches thick and standard in size for the bed; and clean, comfortable pillows of average bed size. (III)
- c. There shall be a comfortable chair, either a rocking chair or armchair, per resident bed. The resident's personal wishes shall be considered. (III)
- d. There shall be drawer space for each resident's clothing. In a bedroom in which more than one resident resides, drawer space shall be assigned to each resident. (III)
- e. Beds and other furnishings shall not obstruct free passage to and through doorways. (III)
- f. Beds shall not be placed in such a manner that the side of the bed is against the radiator or in close proximity to it unless the radiator is covered so as to protect the resident from contact with it or from excessive heat. (III)
- g. There shall be a wardrobe or closet in each resident's room. Minimum clear dimensions shall be 1 foot 10 inches deep by 1 foot 8 inches wide with full hanging space and provide a clothes rod and shelf. In a multiple bedroom, closet or wardrobe space shall be assigned each resident sufficient for the resident's needs. (III)
- h. Each room shall have sufficient accessible mirrors to serve resident's needs. (III)
- i. Useable floor space of a room shall be no less than 8 feet in any major dimension. (III)
- j. Bedrooms shall have a minimum of 60 square feet of useable floor space per bed for a double room, 80 square feet of useable floor space for a single room. (III)
- k. There shall be no more than two residents per room. (III)

63.35(5) Bath and toilet facilities.

- a. All sinks shall have paper towel dispensers and an available supply of soap. (III)
- b. Toilet paper shall be readily available to residents. (III)

c. There shall be a minimum of one toilet and bath facility for five residents. (III)

63.35(6) Heating. A centralized heating system shall be maintained in good working order and capable of maintaining a comfortable temperature for residents of the facility. Portable units or space heaters are prohibited from being used in the facility except in an emergency. (II, III)

63.35(7) Water supply.

a. Private sources of water supply shall be tested annually and the report made available for review by the department upon request. (III)

b. A bacterially unsafe source of water supply shall be grounds for denial, suspension, or revocation of license. (III)

c. The department may require testing of private sources of water supply at its discretion in addition to the annual test. The facility shall supply reports of such tests as directed by the department. (III)

d. Hot and cold running water under pressure shall be available in the facility. (II, III)

e. Prior to construction of a new facility or new water source, private sources of water supply shall be surveyed and shall comply with the requirements of the department. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.36(135C) Family and employee accommodations. If the family or employees live within the facility, separate living quarters and recreation facilities shall be required for the family or employees distinct from such areas provided for the residents. (III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

481—63.37(135C) Animals. No animals shall be allowed to reside in the facility except with written approval of the department and under controlled conditions. (II, III)

[ARC 3740C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code chapter 135C.

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◊ Two or more ARCs

- ¹ Effective date of 63.15(2) “a” and “b” delayed 70 days by the Administrative Rules Review Committee, IAB 2/26/86. Effective date of 63.15(2) “a” and “b” delayed until the expiration of 45 calendar days into the 1987 session of the General Assembly pursuant to Iowa Code section 17A.8(9), IAC 6/4/86.
- ² See IAB, Inspections and Appeals Department.
- ³ Rule 481—63.49(135C), effective 7/1/92.
- ⁴ September 7, 2016, effective date of 57.19(3) “d,” 62.15(2) “d,” and 63.18(3) “d” [ARC 2643C] delayed 70 days by the Administrative Rules Review Committee at its meeting held August 5, 2016.

ENVIRONMENTAL PROTECTION COMMISSION[567]

Former Water, Air and Waste Management[900], renamed by 1986 Iowa Acts, chapter 1245, Environmental Protection Commission under the “umbrella” of the Department of Natural Resources.

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DIVISION B
DRINKING WATER
CHAPTER 40
SCOPE OF DIVISION—DEFINITIONS—FORMS—RULES OF PRACTICE
[Prior to 12/3/86, Water, Air and Waste Management [900]]

567—40.1(455B) Scope of division. The department conducts the public water supply program and establishes minimum standards for the construction of private water supply systems. The public water supply program includes the following: the establishment of drinking water standards, including maximum contaminant levels, treatment techniques, maximum residual disinfectant levels, action levels, monitoring, viability assessment, consumer confidence reporting, public notice requirements, public water supply system operator certification standards, environmental drinking water laboratory certification program, and a state revolving loan program consistent with the federal Safe Drinking Water Act, and the establishment of construction standards. The construction, modification and operation of any public water supply system requires a specific permit from the department. Certain construction permits are issued upon certification by a licensed professional engineer that a project meets standards, and, in certain instances, permits are issued by local authorities pursuant to 567—Chapter 9. Private water supplies are regulated by local boards of health.

Chapter 38 contains requirements for private water well construction permits, including test wells and monitoring wells.

Chapter 39 contains requirements for the proper closure or abandonment of wells.

Chapter 40 includes rules of practice, including designation of forms, applicable to the public in the department's administration of the subject matter of this division.

Chapter 41 contains the drinking water standards and specific monitoring requirements for the public water supply program.

Chapter 42 contains the public notification, public education, consumer confidence reporting, and record-keeping requirements for the public water supply program.

Chapter 43 contains specific design, construction, fee, operating, and operation permit requirements for the public water supply program.

Chapter 44 contains the drinking water state revolving fund program for the public water supply program.

Chapter 49 contains the nonpublic water supply well requirements.

Chapters 50 to 52 contain the provisions for water withdrawal and allocation.

Chapter 55 contains the provisions for public water supply aquifer storage and recovery.

Chapter 81 contains the provisions for the certification of public water supply system operators.

Chapter 82 contains the provisions for the certification of water well contractors.

Chapter 83 contains the provisions for the certification of laboratories to provide environmental testing of drinking water supplies.

[ARC 9915B, IAB 12/14/11, effective 1/18/12]

567—40.2(455B) Definitions.

“*Act*” means the Safe Drinking Water Act as amended (42 U.S.C. 300f et seq.).

“*Action level*” is the concentration of lead or copper in water which determines, in some cases, the treatment requirements that a water system is required to complete.

“*Acute health effect*” means the health effect of a contaminant which is an immediate rather than a long-term risk to health.

“*Animal confinement*” means a lot, yard, corral, or similar structure in which the concentration of livestock or poultry is such that a vegetative cover is not maintained.

“*Animal pasturage*” means a fenced area where vegetative cover is maintained and in which animals are enclosed.

“*Animal waste*” means animal wastes consisting of excreta, leachings, feed losses, litter, washwaters or other associated wastes.

“*Animal waste stockpiles*” means the stacking, composting or containment of animal wastes.

“Animal waste storage basin or lagoon” means a fully or partially excavated or diked earthen structure used for containing animal waste, including earthen sideslopes or floor.

“Animal waste storage tank” means a completely fabricated structure, with or without a cover, either formed in place or transported to the site, used for containing animal wastes.

“Antisiphon device” means a device which will prevent back siphonage by means of a relief valve which automatically opens to the atmosphere, preventing the creation of subatmospheric pressure within a pipe, thereby preventing water from reversing its flow.

“Authority” means the Iowa finance authority (IFA) as established by Iowa Code chapter 16.

“Backflow” means the flow of water or other liquids, mixtures, or substances into the distribution system of a potable water supply from any source other than its permitted source.

“Backflow preventer” is a device or means to prevent backflow into a potable water system.

“Back siphon” means the flowing back of used, contaminated, or polluted water, from a plumbing fixture or vessel as a result of negative or subatmospheric pressure within the distribution system.

“Bag filters” means pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to the outside.

“Bank filtration” means a water treatment process that uses a well to recover surface water that has naturally infiltrated into groundwater through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s).

“Best available technology” or *“BAT”* means the best technology, treatment techniques, or other means which the state finds, after examination, for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration).

“Cartridge filters” means pressure-driven separation devices that remove particulate matter larger than 1 micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside.

“Cistern” means a tank in which rainwater from roof drains is stored.

“Clean compliance history” means, for the purposes of 567—paragraph 41.2(1)“e”(4)“2,” a record of no monitoring violations and no coliform treatment technique trigger exceedances or treatment technique violations under 567—subrule 41.2(1).

“Coagulation” means a process using coagulation chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

“Combined distribution system (CDS)” means the interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water.

“Commission” means the environmental protection commission of the state of Iowa.

“Community water system (CWS)” means a public water supply system which has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

“Compliance cycle” means the nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar year cycle begins January 1, 1993, and ends December 31, 2001; the second begins January 1, 2002, and ends December 31, 2010; the third begins January 1, 2011, and ends December 31, 2019, and continues every nine years thereafter.

“Compliance period” means a three-year (calendar year) period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first compliance period runs from January 1, 1993, to December 31, 1995; the second from January 1, 1996, to December 31, 1998; the third from January 1, 1999, to December 31, 2001, and continues every three years thereafter.

“Composite correction program (CCP)” is a systematic, comprehensive procedure that identifies and corrects the unique combination of factors, in the areas of design, operation, maintenance, and administration, that limit the performance of a filtration plant. The CCP is comprised of two elements:

comprehensive performance evaluation, which is the evaluation phase, and comprehensive technical assistance, which is the performance improvement phase.

“*Comprehensive performance evaluation (CPE)*” is a thorough review and analysis of a treatment plant’s performance-based capabilities and associated administrative, operation and maintenance practices. The CPE is conducted to identify factors that may be adversely impacting a plant’s capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. For purposes of compliance with surface water or influenced groundwater treatment plant requirements pursuant to 567—Chapters 41, 42, and 43, the comprehensive performance evaluation must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report.

“*Comprehensive technical assistance (CTA)*” is the performance improvement phase of the composite correction plan that is implemented if the comprehensive performance evaluation results indicate improved performance potential by a filtration plant, in which the system must identify and systematically address plant-specific factors.

“*Confluent growth*” means a continuous bacterial growth covering the entire filtration area of a membrane filter, or a portion thereof, in which bacterial colonies are not discrete.

“*Consecutive public water supply*” means an active public water supply which purchases or obtains all or a portion of its water from another, separate public water supply, also called a wholesale system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

“*Conservation easements*” means an interest in land that entitles a person to use the land possessed by another (affirmative easement), or to restrict uses of the land subject to the easement (negative easement). A conservation easement restricts the landowner to uses that are compatible with resource conservation.

“*Contaminant*” means any physical, chemical, biological, or radiological substance or matter in water.

“*Contiguous*” means directly adjacent or touching along all or most of one side of a legally defined piece of property. Tracts of land involved in the same operation or water supply and separated only by roads, railroads, or bike trails are deemed contiguous tracts.

“*Conventional filtration treatment*” means a series of processes including coagulation, flocculation, sedimentation, and filtration resulting in substantial particulate removal.

“*Corrosion inhibitor*” means a substance capable of reducing the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective film on the interior surface of those materials.

“*Corrosive water*” means a water which due to its physical and chemical characteristics may cause leaching or dissolving of the constituents of the transporting system in which it is contained.

“*Cross connection*” means any actual or potential connection between a potable water supply and any other source or system through which it is possible to introduce into the potable system any used water, industrial fluid, gas, or other substance other than the intended potable water with which the system is supplied.

“*Customers*” in consumer confidence reports are defined as billing units or service connections to which water is delivered by a community water system.

“*Deep well*” means a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

“*Department*” means the Iowa department of natural resources, which has jurisdiction over all nontribal public water systems in Iowa.

“*Diatomaceous earth filtration*” means a process resulting in substantial particulate removal in which (1) a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum), and (2) while the water is filtered by passing through the cake on the septum, additional filter

media known as body feed is continuously added to the feed water to maintain the permeability of the filter cake.

“*Direct filtration*” means a series of processes including coagulation and filtration but excluding sedimentation resulting in substantial particulate removal.

“*Director*” means the director of the Iowa department of natural resources or a designee.

“*Disinfectant*” means any oxidant, including but not limited to chlorine, chlorine dioxide, chloramines, and ozone added to water in any part of the treatment process or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

“*Disinfection*” means a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

“*Disinfection profile*” is a summary of *Giardia lamblia* inactivation through the treatment plant. The procedure for developing a disinfection profile is contained in 567—paragraph 43.9(2) “b” and 567—subrule 43.10(2).

“*Dose equivalent*” means the product of the absorbed dose from ionizing radiation and such factors as account for differences in biological effectiveness due to the type of radiation and its distribution in the body as specified by the International Commission on Radiological Units and Measurements (ICRU).

“*Drinking water state revolving fund*” or “*DWSRF*” means the department-administered fund intended to develop drinking water revolving loans to help finance drinking water infrastructure improvements, source water protection, system technical assistance, and other activities intended to encourage and facilitate public water supply system rule compliance and public health protection established by Iowa Code sections 455B.291 to 455B.299.

“*DWSRF funds*” means the combination of a particular fiscal year’s federal capitalization grant appropriation plus the 20 percent state of Iowa match and any additional funds made available through the program.

“*Effective corrosion inhibitor residual*” means a concentration of corrosion inhibitor sufficient to form a passivating film on the interior walls of a pipe.

“*Eligible cost*” means the cost of all labor, material, machinery, equipment, loan initiation and loan service fees, project planning, design and construction engineering services, legal fees and expenses directly related to the project, capitalized interest during construction of the project, and all other expansion, construction, and rehabilitation of all or part of a project included in the funding request placed on the draft intended use plan as a fundable project, subject to approval by the commission.

“*Enhanced coagulation*” means the addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment.

“*Enhanced softening*” means the improved removal of disinfection byproduct precursors by precipitative softening.

“*Federal cross-cutters*” means the federal laws and authorities that apply to projects funded through the DWSRF.

“*Filter profile*” is a graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed.

“*Filtration*” means a process for removing particulate matter from water by passage through a porous media.

“*Finished water*” means water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as treatment necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion chemicals).

“*First draw sample*” means a one-liter sample of tap water, collected in accordance with 567—paragraph 41.4(1) “c” that has been standing in plumbing pipes at least six hours and is collected without flushing the tap.

“*Fiscal year*” means the federal fiscal year starting October 1 and ending September 30.

“*Flocculation*” means a process to enhance agglomeration or collection of smaller floc particles into larger, more easily settleable particles through gentle stirring by hydraulic or mechanical means.

“*Flowing stream*” means a course of running water flowing in a definite channel.

“*GAC10*” means granular activated carbon filter beds with an empty-bed contact time of ten minutes based on average daily flow and a carbon reactivation frequency of every 180 days, except that the reactivation frequency for GAC10 is 120 days when used as a best available technology for compliance with the maximum contaminant level locational running annual average for total trihalomethanes and haloacetic acids.

“*GAC20*” means granular activated carbon filter beds with an empty-bed contact time of 20 minutes based on average daily flow and a carbon reactivation frequency of every 240 days.

“*Gross alpha particle activity*” means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

“*Gross beta particle activity*” means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

“*Haloacetic acids (HAA5)*” means the sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

“*Halogen*” means one of the chemical elements chlorine, bromine or iodine.

“*Health advisory (HA)*” means a group of levels set by EPA below which no harmful health effect is expected from a given contaminant in drinking water. The HAs used by the department are listed in the most current edition of the EPA “Drinking Water Regulations and Health Advisories” bulletin. The lifetime HA is the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects over a lifetime of exposure, with a margin of safety. The long-term HA is the concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects up to approximately seven years (10 percent of an individual’s lifetime of exposure), with a margin of safety.

“*Human consumption*” means water used as part of or in connection with drinking; washing; food processing or incidental to commercial food preparation, such as: water used in beverages or other food items; ice used in drinks or in salad bars; water for washing of vegetables or other food items; water used for washing dishes; pans or utensils used in food preparation or service; water used for cleanup and washing of food preparation or service areas; water for bathing, showering, hand washing, or oral hygiene purposes. Human consumption does not include: water for production of packaged or bulk food products regulated by other state or federal regulatory agencies, such as livestock slaughtering or bottled or canned food and beverages; cooling water; industrial or commercial wash waters used for nonfood products; irrigation water; water used in toilets or urinals.

“*Impoundment*” means a reservoir, pond, or lake in which surface water is retained for a period of time, ranging from several months upward, created by constructing a barrier across a watercourse and used for storage, regulation or control of water.

“*Influenced groundwater (IGW)*” means any groundwater which is under the direct or indirect influence of surface water, as determined by the presence of (1) significant occurrence of insects or other macroorganisms, algae or large-diameter pathogens such as *Giardia lamblia* or *Cryptosporidium*; or (2) significant and relatively rapid shifts in water characteristics such as turbidity (particulate content), temperature, conductivity, or pH which correlate to climatological or surface water conditions, or other parameters as specified in 567—43.5(455B).

“*Initial compliance period*” means the first full three-year compliance period of a compliance cycle.

“*Intended use plan (IUP)*” means a plan identifying the intended uses of funds available for loans in the DWSRF for each fiscal year as described in Section 1452 of the Safe Drinking Water Act.

“*Lake or reservoir*” means a natural or man-made basin or hollow on the Earth’s surface in which water collects or is stored that may or may not have a current or single direction of flow.

“*Large water system*” means a water system that serves more than 50,000 persons.

“*Lead free,*” when used with respect to solder and flux, refers to solders and flux containing not more than 0.2 percent lead; when used with respect to pipes and pipe fittings, refers to pipes and pipe fittings

containing not more than 8.0 percent lead; and, when used with respect to plumbing fittings and fixtures intended by the manufacturer to dispense water for human ingestion, refers to fittings and fixtures that are in compliance with standards established in accordance with 42 U.S.C. 300-g-6(e).

“Lead service line” means a service line made of lead which connects the water main to the building inlet and any lead pigtail, gooseneck, or other fitting which is connected to such lead line. A lead gooseneck is not considered a lead service line unless it exceeds 10 feet.

“Legionella” means a genus of bacteria, some species of which have caused a type of pneumonia called legionnaires’ disease.

“Level 1 assessment” means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform bacteria monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 1 assessment is conducted by the system operator or owner. Minimum elements of the assessment include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a groundwater system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The system owner or operator must conduct the assessment consistent with any department directives that tailor specific assessment elements with respect to the size and type of the system and the size, type, and characteristics of the distribution system.

“Level 2 assessment” means an evaluation to identify the possible presence of sanitary defects, defects in distribution system coliform bacteria monitoring practices, and (when possible) the likely reason that the system triggered the assessment. A Level 2 assessment provides a more detailed examination of the system (including the system’s monitoring and operational practices) than does a Level 1 assessment through the use of more comprehensive investigation and review of available information, additional internal and external resources, and other relevant practices. A Level 2 assessment is conducted by a department water supply inspector and will typically include the system operator. Minimum elements of the assessment include review and identification of atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., whether a groundwater system is disinfected); existing water quality monitoring data; and inadequacies in sample sites, sampling protocol, and sample processing. The department may tailor specific assessment elements with respect to the size and type of the system and the size, type and characteristics of the distribution system. The system must comply with any expedited actions or additional actions required by the department in the case of an *E. coli* MCL violation.

“Locational running annual average (LRAA)” means the average of the analytical results for samples taken at a particular monitoring location during the previous four calendar quarters.

“Maintenance” means the replacement of equipment or materials that are necessary to maintain the operation of the public water supply system but do not alter capacity, water quality or treatment method or effectiveness.

“Man-made beta particle and photon emitters” means all radionuclides emitting beta particles or photons or both listed in Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure, NBS Handbook 69, except the daughter products of thorium-232, uranium-235 and uranium-238.

“Maximum contaminant level” means the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

“Maximum contaminant level goal (MCLG)” means the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MCLGs are nonenforceable health goals.

“Maximum residual disinfectant level (MRDL)” means a level of a disinfectant added for water treatment that may not be exceeded at the consumer’s tap without an unacceptable possibility of adverse health effects.

“Maximum residual disinfectant level goal (MRDLG)” means the maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants.

“Medium-size water system” means a water system that serves greater than 3,300 and less than or equal to 50,000 persons.

“Membrane filtration” means a pressure- or vacuum-driven separation process in which particulate matter larger than 1 micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis.

“Nonacute health effect” means the health effect of a contaminant which is a long-term rather than immediate risk to health.

“Noncommunity water system” means a public water system that is not a community water system. A noncommunity water system is either a “transient noncommunity water system (TNC)” or a “nontransient noncommunity water system (NTNC).”

“Nontransient noncommunity water system” or *“NTNC”* means a public water system other than a community water system which regularly serves at least 25 of the same persons four hours or more per day, for four or more days per week, for 26 or more weeks per year. Examples of NTNCs are schools, day-care centers, factories, offices and other public water systems which provide water to a fixed population of 25 or more people. In addition, other service areas, such as hotels, resorts, hospitals and restaurants, are considered as NTNCs if they regularly serve at least 25 or more of the same persons for four or more hours per day, for four or more days per week, for 26 or more weeks of the year.

“Optimal corrosion control treatment” means the corrosion control treatment that minimizes the lead and copper concentrations at users’ taps while ensuring that the treatment does not cause the water system to violate any drinking water standards (567—Chapters 40 to 43).

“Performance evaluation sample” means a reference sample provided to a laboratory for the purpose of demonstrating that a laboratory can successfully analyze the sample within limits of performance specified by the department. The true value of the concentration of the reference material is unknown to the laboratory at the time of analysis.

“Picocurie (pCi)” means that quantity of radioactive material producing 2.22 nuclear transformations per minute.

“Plant intake” means the works or structures at the head of a conduit through which water is diverted from a surface water source (e.g., river, reservoir, or lake) into the treatment plant.

“Point of disinfectant application” is the point where the disinfectant is applied and water downstream of that point is not subject to recontamination by surface water runoff.

“Point-of-entry treatment device (POE)” is a treatment device applied to the drinking water entering a house or building for the purpose of reducing contaminants in the drinking water distributed throughout the house or building.

“Point-of-use treatment device (POU)” is a treatment device applied to a single tap or multiple taps used for the purpose of reducing contaminants in drinking water at those taps, but is not intended to treat all of the water in the facility.

“Population served” means the total number of persons served by a public water supply that provides water intended for human consumption. For municipalities which serve only the population within their incorporated boundaries, it is the last official U.S. census population (or officially amended census population). For all other community public water supply systems, it is either the actual population counted which is verifiable by the department, or population as calculated by multiplying the number of service connections by an occupancy factor of 2.5 persons per service connection. For municipalities which also serve outside their incorporated boundaries, the served population must be

added to the official census population determined either by verifiable count or by the 2.5 persons per service connection occupancy factor. For nontransient noncommunity (NTNC) and transient noncommunity (TNC) systems, it is the average number of daily employees plus the average number of other persons served such as customers or visitors during the peak month of the year regardless if each person actually uses the water for human consumption. Where a system provides water to another public water supply system (consecutive public water supply system) which is required to have an operation permit, the population of the recipient water supply shall not be counted as a part of the water system providing the water. Community and nontransient noncommunity public water supply systems will pay their operation permit fees based upon the population served.

“Presedimentation” means a preliminary treatment process used to remove gravel, sand, and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant.

“Privy” means a structure used for the deposition of human body wastes.

“Project” includes the planning, design, construction, alteration or extension of any public water supply system but does not include the maintenance of a system.

“Project priority list” means the list of projects in priority order that may qualify for DWSRF loan assistance contained in the IUP document prepared pursuant to rule 567—44.8(455B). The priority list shall identify all projects eligible for funding and the points assigned to each project pursuant to 567—subrule 44.7(7).

“Public water supply system control” is defined as one of the following forms of authority over a service line: authority to set standards for construction, repair, or maintenance of the service line; authority to replace, repair, or maintain the service line; or ownership of the line. Contaminants added to the water under circumstances controlled by the water consumer or user, with the exception of those contaminants resulting from the corrosion of piping and plumbing caused by water quality, are excluded from this definition of control.

“Public water supply system (PWS)” means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any “special irrigation district.” A public water system is either a “community water system” or a “noncommunity water system.”

“Regional water system” means a public water supply system in which the projected number of service connections in at least 50 percent of the length of the distribution system does not average more than eight service connections per linear mile of water main.

“Rem” means the unit of dose equivalent from ionizing radiation to the total body or any internal organ or organ system. A “millirem” (mrem) is 1/1000 of a rem.

“Repeat compliance period” means any subsequent compliance period after the initial compliance period.

“Residual disinfectant concentration” (“C” in CT calculations) means the concentration of disinfectant measured in mg/l in a representative sample of water.

“Sanitary defect” means a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.

“Sanitary sewer pipe” means a sewer complying with the department’s standards for sewer construction.

“Sanitary survey” means a review and on-site inspection conducted by the department of the water source, facilities, equipment, operation and maintenance and records of a public water supply system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water and identifying improvements necessary to maintain or improve drinking water quality, pursuant to 567—subrule 43.1(7).

“*SDWA*” means the Safe Drinking Water Act.

“*Seasonal system*” means a noncommunity water system that is not operated as a public water system on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

“*Sedimentation*” means a water treatment process for removal of solid particles from a suspension before filtration by gravity or separation.

“*Septic tank*” means a watertight tank which receives sewage.

“*Service connections*” means the total number of active and inactive service lines originating from a water distribution main for the purpose of delivering water intended for human consumption. For municipalities, rural water districts, mobile home parks, housing developments, and similar facilities, this includes, but is not limited to, occupied and unoccupied residences and buildings, provided that there is a service line connected to the water main (or another service line), and running onto the property. For rental properties which are separate public water supply systems, this includes, but is not limited to, the number of rental units such as apartments. Connections to a system that delivers water by a constructed conveyance other than a pipe are excluded from the definition, if:

1. The water is used exclusively for purposes other than human consumption;
2. The department determines that alternative water to achieve the equivalent level of public health protection provided by the applicable national primary drinking water regulation is provided for human consumption; or
3. The department determines that the water provided for human consumption is centrally treated or treated at the point of entry by the provider, a pass-through entity, or the user to achieve the equivalent level of protection provided by the applicable national primary drinking water regulations.

“*Service line sample*” means a one-liter sample of water, collected in accordance with 567—paragraph 41.4(1)“c” for the purpose of determining the concentration of lead and copper which has been standing for at least six hours in a service line.

“*Shallow well*” means a well located and constructed in such a manner that there is not a continuous layer of low permeability soil or rock (or equivalent retarding mechanism acceptable to the department) at least 5 feet thick, the top of which is located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

“*Significant deficiency*” includes a defect in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the department determines to be causing, or has the potential for causing the introduction of contamination into the water delivered to consumers.

“*Significant noncompliance*” means the failure to comply with any national primary drinking water standard as adopted by the state of Iowa according to criteria established by the administrator of the federal Environmental Protection Agency.

“*Single-family structure*” means a building constructed as a single-family residence that is currently used as either a residence or a place of business.

“*Slow sand filtration*” means a process involving passage of raw water through a bed of sand at low velocity (generally less than 0.4 m/h (0.02 ft/min)) resulting in substantial particulate removal by physical and biological mechanisms.

“*Small water system*” means a water system that serves 3,300 persons or fewer.

“*Special irrigation district*” means an irrigation district in existence prior to May 18, 1994, that provides primarily agricultural service through a piped water system with only incidental residential or similar use where the system or the residential or similar users of the system comply with numbered paragraphs “2” and “3” in the definition of “service connections.”

“*Standard methods*” means “Standard Methods for the Examination of Water and Wastewater,” American Public Health Association, 1015 15th Street N.W., Washington, DC 20005.

“*Standard sample*” means the aliquot of finished drinking water that is examined for the presence of coliform bacteria.

“*Standard specifications*” means specifications submitted to the department for use as a reference in reviewing future plans for proposed water main construction.

“*Supplier of water*” means any person who owns or operates a public water supply system.

“*Surface water*” means all water which is open to the atmosphere and subject to surface runoff.

“*SUVA*” means Specific Ultraviolet Absorption at 254 nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample’s ultraviolet absorption at a wavelength of 254 nm (in m⁻¹) by its concentration of dissolved organic carbon (in mg/L).

“*Ten States Standards*” means the “Recommended Standards for Water Works,” 2012 edition as adopted by the Great Lakes—Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

“*Too numerous to count*” means that the total number of bacterial colonies exceeds 200 on a 47-mm diameter membrane filter used for coliform detection.

“*Total organic carbon (TOC)*” means total organic carbon in milligrams per liter, measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two significant figures.

“*Total trihalomethanes (TTHM)*” means the sum of the concentration in milligrams per liter of the trihalomethane compounds trichloromethane (chloroform), dibromochloromethane, bromodichloromethane and tribromomethane (bromoform), rounded to two significant figures.

“*Transient noncommunity water system (TNC)*” means a noncommunity water system that does not regularly serve at least 25 of the same persons over six months per calendar year.

“*Treatment technique (TT)*” means a treatment process required to minimize the level of a contaminant in drinking water. A treatment technique is specified in cases where it is not technically or economically feasible to establish an MCL, and it is an enforceable procedure or level of technological performance which public water systems must follow to ensure control of a contaminant.

“*Trihalomethane (THM)*” means one of the family of organic compounds, named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

“*Two-stage lime softening*” means a process in which chemical addition and hardness precipitation occur in each of two distinct unit clarification processes in series prior to filtration.

“*Uncovered finished water storage facility*” means a tank, reservoir, or other facility used to store water that will undergo no further treatment to reduce microbial pathogens except residual disinfection and is directly open to the atmosphere. Such facilities are prohibited.

“*Unregulated contaminant*” means a contaminant for which no MCL has been set, but which does have federal monitoring requirements for certain public water systems set forth in CFR Title 40, Part 141.40, and additional reporting requirements in rule 567—42.3(455B).

“*Viability*” means the technical, financial, and managerial ability to comply with applicable national primary drinking water standards as adopted by the state of Iowa. Viability is the ability of a system to remain in compliance insofar as the requirements of the SDWA.

“*Virus*” means a virus of fecal origin which is infectious to humans by waterborne transmission.

“*Waterborne disease outbreak*” means the significant occurrence of acute infectious illness, epidemiologically associated with the ingestion of water from a public water system which is deficient in treatment, as determined by the Iowa department of public health.

“*Water distribution system*” means that portion of the water supply system in which water is conveyed from the water treatment plant or other supply point to the premises of the consumer, including any storage facilities and pumping stations.

“*Water main pipe*” means a water main complying with the department’s standards for water main construction.

“*Wholesale system*” means a public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one or more consecutive systems.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—40.3(17A,455B) Forms. The following forms are used by the public to apply for department approvals and to report on activities related to the public water supply program of the department. All

forms may be obtained from the department's website at www.iowadnr.gov (water supply pages) or from the Environmental Services Division, Administrative Support Station, Department of Natural Resources, Henry A. Wallace Building, 502 East Ninth Street, Des Moines, Iowa 50319-0034. Properly completed application forms shall be submitted to the Water Supply Section, Environmental Services Division. Water supply system monthly and other operation reporting forms shall be submitted to the appropriate field office (see 567—subrule 42.4(3)). Properly completed laboratory forms (reference 567—Chapter 83) shall be submitted to the State Hygienic Laboratory or as otherwise designated by the department.

40.3(1) *Construction permit application forms.* Schedules “1a” through “16d” are required.

| <u>Schedule No.</u> | <u>Name of Form</u> | <u>Form Number</u> |
|---------------------|---|--------------------|
| “1a” | General Information | 542-3178 |
| “1b” | Minor Water Main Construction Permit | 542-3151 |
| “1c” | Fee Schedule | 542-3179 |
| “2a” | Water Mains, General | 542-3030 |
| “2b” | Water Mains, Specifications | 542-3031 |
| “2c” | Notification of Minor Water Main Construction | 542-3152 |
| “3a” | Water System, Preliminary Data | 542-3032 |
| “3b” | Water Quality Data | 542-3029 |
| “3c” | Surface Water Quality Data | 542-3028 |
| “4” | Site Selection | 542-3078 |
| “5a” | Well Construction | 542-1005 |
| “5b” | Well Appurtenances | 542-3026 |
| “5c” | Well Profile | 542-1006 |
| “5d” | Surface Water Supply | 542-3139 |
| “6a” | Distribution Water Storage Facilities | 542-3140 |
| “7” | Schematic Flow Diagram | 542-3142 |
| “8” | Aeration | 542-3143 |
| “9” | Clarification/Sedimentation | 542-3144 |
| “10” | Suspended Solids Contact | 542-3145 |
| “11” | Cation Exchange Softening | 542-3146 |
| “12” | Filters | 542-3147 |
| “13a” | Chemical Addition | 542-3241 |
| “13b” | Dry Chemical Addition | 542-3130 |
| “13c” | Gas Chlorination | 542-3131 |
| “13d” | Fluoridation | 542-3132 |
| “13e” | Sampling and Tests | 542-3133 |
| “14” | Pumping Station | 542-3134 |
| “15” | Process Water Storage Facilities | 542-3135 |
| “16a” | Wastewater, General | 542-3136 |
| “16b” | Waste Treatment Ponds | 542-3137 |
| “16c” | Filtration and Mechanical | 542-3138 |
| “16d” | Discharge to Sewer | 542-3103 |

40.3(2) *Operation permit application forms.*

a. Form 13-2 — application for a new water supply 542-1300

b. Form 13-3 — renewal application for an existing water supply 542-1301

40.3(3) *Water supply reporting forms.* The monthly water supply operation report forms are available from the department's water supply operations section website. The laboratory analyses for compliance samples are reported via electronic means directly to the department by each certified laboratory.

40.3(4) *Laboratory certification application forms.* Reserved.
[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—40.4(17A,455B) Public water supply construction permit application procedures.

40.4(1) *General procedures.* Applications for written approval from the department for any new construction or for reconstruction pursuant to 567—Chapter 43 shall consist of complete plans and specifications, application fee, and appropriate water supply construction permit application schedules. Upon review, the department will issue a construction permit for approval of a project if the review shows that the project meets all departmental design standards in accordance with 567—Chapter 43. Approval of a project which does not meet all department design standards will be denied unless a variance as provided by 567—paragraph 43.3(2) “b” is granted. A variance may be requested at the time plans and specifications are submitted or after the design discrepancy is pointed out to the applicant.

The department may review submitted project plans and specifications and provide comments and recommendations to the applicant. Departmental comments and recommendations are advisory, except when departmental review determines that a facility does not comply with the plans or specifications as approved by the department or comply with the design standards pursuant to the criteria for certification of project design. The owner of the system must correct the deficiency in a timely manner as set forth by the department.

40.4(2) *Public water sources and below-ground level water storage facilities—site survey.* For public water sources and for below-ground level finished water storage facilities, a site survey and approval must be made by the department. The manner and procedures for applying for and processing a site survey are the same as in 40.4(1) except that the following information must be submitted by the applicant's engineer.

a. A preliminary engineering report or a cover letter which contains a brief description of the proposed source or storage facility and assurance that the project is in conformance with the long-range planning of the area.

b. Completed Schedule 1a — General Information

c. Completed Schedule 4 — Water Supply Facility Site Selection

d. A detailed map showing all potential sources of contamination (see 567—Chapter 43, Table A) within:

(1) 1,000 feet of a proposed well location. The scale shall not be smaller than 1 inch = 200 feet.

(2) 200 feet of a proposed below-ground level finished water storage facility.

(3) 2,500 feet from a proposed surface water source and a plat showing all facilities more than 2,500 feet from an impoundment (within the drainage area) that may be potential sources of contamination. The scale shall not be smaller than 1 inch = 660 feet.

(4) Six miles upstream of a proposed river intake.

40.4(3) *Modifications of an approved water supply construction project.* Persons seeking to make modifications to a water supply construction project after receiving a prior construction permit from the department shall submit an addendum to plans and specifications, a change order or revised plans and specifications at least 30 days prior to planned construction, and the appropriate fee. The department shall review the submitted material within 30 days of submission and shall issue a supplemental permit if the proposed modifications meet departmental standards.

40.4(4) *Certification of project design.* A permit shall be issued for the construction, installation or modification of a public water supply system or part of a system or for a water supply distribution system extension if a qualified, licensed professional engineer certifies that the plans and specifications comply with federal and state laws and regulations or that a variance to standards has been granted by the department. Refer to Schedule 1a.

567—40.5(17A,455B) Public water supply operation permit application procedures. A person requesting a water supply operation permit pursuant to 567—43.2(455B) must complete the appropriate application form, which will be provided by the department. Upon receipt of a completed application, the department will review the application and, if approved, will prepare and issue a water supply operation permit or draft permit, as applicable, and transmit it to the applicant. An annual operation fee pursuant to 567—subrule 43.2(1) is due by September 1 of each year. A permit or renewal will be denied when the applicant does not meet one or more requirements for issuance or renewal of this permit. An operation permit may be denied for any of the following reasons: system failed to pay the operation fee; system is not viable; system is not in compliance with the applicable maximum contaminant levels, treatment techniques, or action levels; system is in significant noncompliance with the provisions of 567—Chapter 41, 42, or 43.

567—40.6(455B) Drinking water state revolving fund loan application procedures. A person requesting a drinking water state revolving fund loan pursuant to 567—44.7(455B) must complete the appropriate application form, which will be provided by the department. The department will review the application package pursuant to 567—44.9(455B). Eligible projects will be ranked according to priority, with the highest-ranked projects receiving funding priority.

567—40.7(455B) Viability assessment procedures. A person required to complete a viability assessment pursuant to 567—43.8(455B) must submit the appropriate information as outlined in 567—43.8(455B) to the department. Self-assessment worksheets which can be used to prepare the viability assessment are available from the Water Supply Section, Department of Natural Resources, Henry A. Wallace Building, 502 East Ninth Street, Des Moines, Iowa 50319-0034.

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

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[◇] Two or more ARCs

¹ Effective date of definitions “Population served” and “Service connections” and rule 40.5(17A,455B) delayed until adjournment of the 1995 General Assembly by the Administrative Rules Review Committee at its meeting held March 13, 1995.

CHAPTER 41
WATER SUPPLIES

[These rules transferred from Health Department, 1971 IDR (Title II, Chs 1 and 2)]

[Prior to 7/1/83, DEQ Ch 22]

[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—41.1(455B) Primary drinking water regulations—coverage. 567—Chapters 40 through 44 and 83 shall apply to each public water supply system, unless the public water supply system meets all of the following conditions:

1. Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);
2. Obtains all of its water from, but is not owned or operated by, a public water supply system to which such regulations apply;
3. Does not sell water to any person; and
4. Is not a carrier which conveys passengers in interstate commerce.

567—41.2(455B) Biological maximum contaminant level (MCL), treatment technique (TT), and monitoring requirements.

41.2(1) *Coliform bacteria and E. coli.* The provisions of this subrule include both maximum contaminant level and treatment technique requirements. The provisions of this subrule apply to all public water systems. Failure to comply with the applicable requirements in this subrule is a violation of the national primary drinking water regulations.

a. Maximum contaminant level. A public water system must determine compliance with the MCL for *E. coli* for each month in which the system is required to monitor for total coliforms. A system is in compliance with the MCL for *E. coli* for samples taken under this subrule unless any of the following conditions occur. For purposes of the public notification requirements in 567—42.1(455B), violation of the MCL may pose an acute risk to health.

(1) *E. coli*-positive repeat sample. The system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

(2) *E. coli*-positive routine sample. The system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

(3) Failure to collect all required repeat samples following *E. coli*-positive routine samples. The system fails to take all required repeat samples following an *E. coli*-positive routine sample.

(4) Failure to test for *E. coli* on any total coliform-positive repeat sample. The system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

b. Analytical methodology.

(1) Sample volume. The standard sample volume required for analysis is 100 mL, regardless of the analytical method used.

(2) Presence/absence required. Only the presence or absence of total coliforms and *E. coli* is required to be determined in any compliance sample; a determination of density is acceptable but is not required.

(3) Holding time and temperature. The time from sample collection to initiation of test medium incubation may not exceed 30 hours. Systems are encouraged but not required to hold samples below 10° C during transit.

(4) Dechlorinating agent required for chlorinated water. If water having a residual chlorine (measured as free, combined, or total chlorine) is to be analyzed, sufficient sodium thiosulfate (Na₂S₂O₃) must be added to the sample bottle before sterilization to neutralize any residual chlorine in the water sample. Dechlorination procedures are addressed in Section 9060A.2 of Standard Methods for the Examination of Water and Wastewater (20th and 21st editions).

(5) Systems must conduct total coliform and *E. coli* analyses in accordance with one of the analytical methods in the following table.

| Methodology Category | Method ¹ | Citation ¹ |
|---|---|---|
| Total Coliform Bacteria Methods: | | |
| Lactose Fermentation Methods | Standard Total Coliform Fermentation Technique | Standard Methods 9221 B.1, B.2 (20th, 21st, and 22nd ed.) ^{2, 3} Standard Methods Online 9221 B.1, B.2-99, B-06 ^{2, 3} |
| | Presence-Absence (P-A) Coliform Test | Standard Methods 9221 D.1, D.2 (20th and 21st ed.) ^{2, 7} Standard Methods Online 9221 D.1, D.2-99 ^{2, 7} |
| Membrane Filtration Methods | Standard Total Coliform Membrane Filter Procedure | Standard Methods 9222 B, C (20th and 21st ed.) ^{2, 4} Standard Methods Online 9222 B-97 ^{2, 4} , 9222 C-97 ^{2, 4} |
| | Membrane Filtration using MI Medium | EPA Method 1604 ² |
| | m-ColiBlue24 Test ^{2, 4} | |
| | Chromocult ^{2, 4} | |
| Enzyme Substrate Methods | Colilert | Standard Methods 9223 B (20th, 21st and 22nd ed.) ^{2, 5} Standard Methods Online 9223 B-97, B-04 ^{2, 5} |
| | Colilert-18 | Standard Methods 9223 B (21st and 22nd ed.) ^{2, 5} Standard Methods Online 9223 B-04 ^{2, 5} |
| | Colisure | Standard Methods 9223 B (20th, 21st and 22nd ed.) ^{2, 5, 6} Standard Methods Online 9223 B-97, B-04 ^{2, 5, 6} |
| | E*Colite Test ² | |
| | Readycult Test ² | |
| | modified Colitag Test ² | |
| | Tecta EC/TC Test ² | |
| Escherichia coli (E. coli) Methods: | | |
| <i>Escherichia coli</i> Procedures (following Lactose Fermentation Methods) | EC-MUG Medium | Standard Methods 9221 F.1 (20th, 21st and 22nd ed.) ² Standard Methods Online 9221 F-06 ² |
| <i>Escherichia coli</i> Partition Method | EC broth with MUG (EC-MUG) | Standard Methods 9222 G.1c(2) (20th and 21st ed.) ^{2, 8} |
| | NA-MUG Medium | Standard Methods 9222 G.1c(1) (20th and 21st ed.) ² |
| Membrane Filtration Methods | Membrane Filtration using MI Medium | EPA Method 1604 ² |
| | m-ColiBlue24 Test ^{2, 4} | |
| | Chromocult ^{2, 4} | |
| Enzyme Substrate Methods | Colilert | Standard Methods 9223 B (20th, 21st and 22nd ed.) ^{2, 5} Standard Methods Online 9223 B-97, B-04 ^{2, 5, 6} |
| | Colilert-18 | Standard Methods 9223 B (21st and 22nd ed.) ^{2, 5} Standard Methods Online 9223 B-04 ^{2, 5} |
| | Colisure | Standard Methods 9223 B (20th, 21st and 22nd ed.) ^{2, 5, 6} Standard Methods Online 9223 B-97, 04 ^{2, 5, 6} |
| | E*Colite Test ² | |
| | Readycult Test ² | |
| | modified Colitag Test ² | |
| | Tecta EC/TC Test ² | |

¹The procedures must be done in accordance with the documents listed in 41.2(1)"a"(6). For Standard Methods, either the 20th (1998) or 21st (2005) edition may be used. For Standard Methods Online, the year in which each method was approved by the Standard Methods Committee is designated by the last two digits following the hyphen in the method number. The methods listed are the only

online versions that may be used. For vendor methods, the date of the method listed in 41.2(1)“a”(6) is the date/version of the approved method. The methods listed are the only versions that may be used for compliance with this rule. Laboratories should be careful to use only the approved versions of the methods, as product package inserts may not be the same as the approved versions of the methods.

²Incorporated by reference. See 41.2(1)“a”(6).

³Lactose broth, as commercially available, may be used in lieu of lauryl tryptose broth if the system conducts at least 25 parallel tests between lactose broth and lauryl tryptose broth using the water normally tested and if the findings from this comparison demonstrate that the false-positive rate and the false-negative rate for total coliforms, using lactose broth, is less than 10 percent.

⁴All filtration series must begin with membrane filtration equipment that has been sterilized by autoclaving. Exposure of filtration equipment to UV light is not adequate to ensure sterilization. Subsequent to the initial autoclaving, exposure of the filtration equipment to UV light may be used to sanitize the funnels between filtrations within a filtration series. Alternatively, membrane filtration equipment that is presterilized by the manufacturer (i.e., disposable funnel units) may be used.

⁵Multiple-tube and multi-well enumerative formats for this method are approved for use in presence-absence determination under this subrule.

⁶Colisure results may be read after an incubation time of 24 hours.

⁷A multiple-tube enumerative format, as described in Standard Methods for the Examination of Water and Wastewater 9221, is approved for this method for use in presence-absence determination under this subrule.

⁸The following changes must be made to the EC broth with MUG (EC-MUG) formulation: Potassium dihydrogen phosphate, KH₂PO₄, must be 1.5 g, and 4-methylumbelliferyl-beta-D-glucuronide must be 0.05 g.

(6) Methods incorporated by reference. The standards required in this subrule are incorporated by reference with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR Part 51. All approved material is available for inspection either electronically at www.regulations.gov, in hard copy at the Water Docket, or from the sources indicated below. The Docket ID is EPA-HQ-OW-2008-0878. Hard copies of these documents may be viewed at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301 Constitution Avenue, NW, Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202)566-1744, and the telephone number for the Water Docket is (202)566-2426. Copyrighted materials are only available for viewing in hard copy. These documents are also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202)741-6030 or go to www.archives.gov/federal-register/code-of-federal-regulations/ibr-locations.html.

1. American Public Health Association, 800 I Street, NW, Washington, DC 20001. Standard Methods for the Examination of Water and Wastewater, 20th edition (1998):

- Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” B.1, B.2, “Standard Total Coliform Fermentation Technique.”
- Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” D.1, D.2, “Presence-Absence (P-A) Coliform Test.”
- Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” B, “Standard Total Coliform Membrane Filter Procedure.”
- Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” C, “Delayed-Incubation Total Coliform Procedure.”
- Standard Methods 9223, “Enzyme Substrate Coliform Test,” B, “Enzyme Substrate Test,” Colilert and Colisure.
- Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” F.1, “*Escherichia coli* Procedure: EC-MUG Medium.”
- Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” G.1c(2), “*Escherichia coli* Partition Method: EC Broth with MUG (EC-MUG).”
- Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” G.1c(1), “*Escherichia coli* Partition Method: NA-MUG Medium.”

2. American Public Health Association, 800 I Street, NW, Washington, DC 20001. Standard Methods for the Examination of Water and Wastewater, 21st edition (2005):

- Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” B.1, B.2, “Standard Total Coliform Fermentation Technique.”
 - Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” D.1, D.2, “Presence-Absence (P-A) Coliform Test.”
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 - Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” C, “Delayed-Incubation Total Coliform Procedure.”
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 - Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” G.1.c(2), “*Escherichia coli* Partition Method: EC Broth with MUG (EC-MUG).”
 - Standard Methods 9222, “Membrane Filter Technique for Members of the Coliform Group,” G.1.c(1), “*Escherichia coli* Partition Method: NA-MUG Medium.”
3. American Public Health Association, 800 I Street, NW, Washington, DC 20001. “Standard Methods Online” available at www.standardmethods.org:
- Standard Methods Online 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group” (1999), B.1, B.2-99, B-06, “Standard Total Coliform Fermentation Technique.”
 - Standard Methods Online 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group” (1999), D.1, D.2-99, “Presence-Absence (P-A) Coliform Test.”
 - Standard Methods Online 9222, “Membrane Filter Technique for Members of the Coliform Group” (1997), B-97, “Standard Total Coliform Membrane Filter Procedure.”
 - Standard Methods Online 9222, “Membrane Filter Technique for Members of the Coliform Group” (1997), C-97, “Delayed-Incubation Total Coliform Procedure.”
 - Standard Methods Online 9223, “Enzyme Substrate Coliform Test” (1997), B-97, “Enzyme Substrate Test,” Colilert and Colisure.
4. Charm Sciences, Inc., 659 Andover Street, Lawrence, MA 01843-1032; telephone (800)343-2170: E*Colite—“Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water,” January 9, 1998.
5. CPI International, Inc., 5580 Skylane Blvd., Santa Rosa, CA 95403; telephone (800)878-7654: modified Colitag, ATP D05-0035—“Modified Colitag Test Method for the Simultaneous Detection of *E. coli* and other Total Coliforms in Water,” August 28, 2009.
6. EMD Millipore (a division of Merck KGaA, Darmstadt, Germany), 290 Concord Road, Billerica, MA 01821; telephone (800)645-5476:
- Chromocult—“Chromocult Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and *Escherichia coli* for Finished Waters,” November 2000, Version 1.0.
 - ReadyCult—“ReadyCult Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters,” January 2007, Version 1.1.
7. EPA’s Water Resource Center (MC-4100T), 1200 Pennsylvania Avenue, NW, Washington, DC 20460; telephone (202)566-1729: EPA Method 1604, EPA 821-R-02-024—“EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium),” September 2002, www.nemi.gov.
8. Hach Company, P.O. Box 389, Loveland, CO 80539; telephone (800)604-3493: m-ColiBlue24—“Membrane Filtration Method m-ColiBlue24 Broth,” Revision 2, August 17, 1999.
9. American Public Health Association, 800 I Street, NW, Washington, DC 20001. Standard Methods for the Examination of Water and Wastewater, 22nd edition (2012):
- Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” B.1, B.2, “Standard Total Coliform Fermentation Technique.”

- Standard Methods 9223, “Enzyme Substrate Coliform Test,” B, “Enzyme Substrate Test,” Colilert and Colisure.

- Standard Methods 9221, “Multiple-Tube Fermentation Technique for Members of the Coliform Group,” F.1, “*Escherichia coli* Procedure: EC-MUG Medium.”

10. Veolia Water Solutions and Technologies, Suite 4697, Biosciences Complex, 116 Barrie Street, Kingston, Ontario, Canada K7L 3N6: Tecta EC/TC. “Presence/Absence Method for Simultaneous Detection of Total Coliforms and *Escherichia coli* in Drinking Water,” April 2014.

(7) Laboratory certification. Systems must have all compliance samples required under this subrule analyzed by a laboratory certified by the department in accordance with 567—Chapter 83 to analyze drinking water samples. The laboratory used by the system must be certified for each method and associated contaminant used for compliance monitoring analyses under this subrule.

c. Sampling plan.

(1) Written sampling plan required. Systems must collect total coliform samples according to the written sampling plan.

1. Systems must develop a written sampling plan that identifies sample locations and a sample collection schedule that are representative of water throughout the distribution system. Major elements of the plan shall include, but not be limited to, the following:

- Map of the distribution system served by the system;
- List of routine compliance sample locations for each sample period;
- List of repeat compliance sample locations for each routine compliance sample location;
- Any other sample locations necessary to meet the requirements of this subrule;
- Sample collection schedule;
- Proper sampling technique instructions;
- Log of samples taken; and
- For groundwater systems subject to 567—41.7(455B), triggered source water monitoring plan.

2. The system shall review the sampling plan every two years and update it as needed and shall retain the sampling plan on file at the facility. The plan must be made available to the department upon request and for review during sanitary surveys and must be revised by the system at the direction of the department.

3. Monitoring under this subrule may take place at a customer’s premises, dedicated sampling station, or other designated compliance sampling location.

(2) Sampling schedule. Systems must collect routine samples at regular time intervals throughout the month. Systems that use only groundwater and serve 4,900 or fewer people, or regional water systems that use only groundwater and serve less than 121 miles of pipe, may collect all required routine samples on a single day if the samples are taken from different sites.

(3) Minimum number of required routine samples. Systems must take at least the minimum number of required routine samples even if the system has had an *E. coli* MCL violation or has exceeded the coliform treatment technique triggers in 41.2(1)“l.” Such samples must be designated as “routine” when submitted to the laboratory.

(4) Additional compliance monitoring samples. A system may conduct more compliance monitoring than is required to investigate potential problems in the distribution system and may use monitoring as a tool to assist in uncovering problems. A system may take more than the minimum number of required routine samples and must include the results when calculating whether the coliform treatment technique trigger in 41.2(1)“l”(1)“1” and “2” has been exceeded only if the samples are taken in accordance with the existing sampling plan and are representative of water throughout the distribution system. Such samples must be designated as “routine” when submitted to the laboratory.

(5) Repeat samples. Systems must identify repeat monitoring locations in the sampling plan. Repeat samples must be analyzed at the same laboratory as the corresponding original routine sample(s), unless written approval for use of a different laboratory is granted by the department. The system must collect at least one repeat sample from the sampling tap where the original routine total coliform-positive sample was taken, at least one repeat sample at a tap within five service connections upstream of the original sample location, and at least one repeat sample at a tap within five service

connections downstream of the original sample location. Such samples must be designated as “repeat” when submitted to the laboratory.

1. If the sampling location of a total coliform-positive sample is at or within one service connection from the end of the distribution system, the system must still take all required repeat samples. However, the department may allow an alternative sampling location in lieu of one of the upstream or downstream sampling locations.

2. A groundwater system with two or more wells that is required to conduct triggered source water monitoring under subrule 41.7(3) must collect groundwater source sample(s) in addition to the required repeat samples.

3. A groundwater system with a single well that is required to conduct triggered source water monitoring may, with written department approval, collect one of its required repeat samples at the triggered source water sample monitoring location. The system must demonstrate to the department’s satisfaction that the sampling plan remains representative of water quality in the distribution system. If approved, the sample result may be used to meet the requirements of subrule 41.7(3) and this subrule. If a repeat sample taken at the triggered source water monitoring location is *E. coli*-positive, the system has violated the *E. coli* MCL, and must also comply with the requirements for additional source water samples under 41.7(3) “a”(3).

4. The department may review, revise, and approve, as appropriate, repeat sampling proposed by the system under 41.2(1) “c”(5). The system must demonstrate that the sampling plan remains representative of the water quality in the distribution system.

(6) Special purpose samples. Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, must not be used to determine whether the coliform treatment technique trigger has been exceeded. Repeat samples are not considered special purpose samples and must be used to determine whether the coliform treatment technique trigger has been exceeded. Such samples must be designated as “special” when submitted to the laboratory and cannot be used for compliance.

(7) Residual disinfectant measurement. Any system adding a chemical disinfectant to the water must meet the requirements specified in 567—subparagraph 42.4(3) “b”(1). The minimum required residual disinfectant measurements are as follows, unless otherwise directed by the department in writing:

1. Groundwater systems. A system that uses only groundwater and adds a chemical disinfectant or provides water that contains a disinfectant must measure and record the free and total chlorine residual disinfectant concentration at least at the same points in the distribution system and at the same time as routine and repeat total coliform bacteria samples are collected, as specified in 41.2(1) “e” through 41.2(1) “j.” The system shall report the residual disinfectant concentration to the laboratory with the bacteria sample and comply with the applicable reporting requirements of 567—subrule 42.4(3).

2. Surface water and influenced groundwater systems.

- Any surface water or IGW PWS must meet the requirements for minimum residual disinfectant entering the distribution system pursuant to 567—paragraph 43.5(4) “b”(2) “1”; and

- A system that uses surface water or IGW must comply with the requirements specified in 567—paragraph 43.5(4) “b”(2) “2” for daily distribution system residual disinfectant monitoring. The system must measure and record the free and total chlorine residual disinfectant concentration at least at the same points in the distribution system and at the same time as routine and repeat total coliform bacteria samples are collected, as specified in 41.2(1) “e” through 41.2(1) “j.” The residual disinfectant measurements required as a part of this subrule may be used to satisfy the requirement in 567—paragraph 43.5(4) “b”(2) “2” on the day(s) when a routine or repeat total coliform bacteria sample(s) is collected, in lieu of separate samples. The system shall report the residual disinfectant concentration to the laboratory with the bacteria sample and comply with the applicable reporting requirements of 567—subrule 42.4(3).

d. *Invalidation of total coliform samples.* A total coliform-positive sample invalidated under this paragraph does not count toward meeting the minimum monitoring requirements of this subrule.

(1) The department may invalidate a total coliform-positive sample only if the following conditions are met:

1. The laboratory establishes that improper sample analysis caused the total coliform-positive result.

2. The department, on the basis of the results of the required repeat samples, determines that the total coliform-positive sample resulted from a domestic or other non-distribution system plumbing problem. "Domestic or other non-distribution system plumbing problem" means a coliform contamination problem in a public water system with more than one service connection that is limited to the specific service connection from which the coliform-positive sample was taken. The department cannot invalidate a sample on the basis of repeat sample results unless all repeat samples collected at the same tap as the original total coliform-positive sample are also total coliform-positive and all repeat samples collected at a location other than the original tap are total coliform-negative. The department cannot invalidate a total coliform-positive sample on the basis of repeat samples if all the repeat samples are total coliform-negative or if the system has only one service connection.

3. The department has substantial grounds to believe that the total coliform-positive result is due to a circumstance or condition that does not reflect water quality in the distribution system. The system must still collect all repeat samples required under 41.2(1)"j" and use them to determine whether a coliform treatment technique trigger in 41.2(1)"l" has been exceeded.

The decision and supporting rationale for invalidating a total coliform-positive sample under 41.2(1)"d"(1) must be documented in writing, and approved and signed by the supervisor of the water supply operations section or water supply engineering section and the department official who recommended the decision. The department must make this document available to EPA and the public. The written documentation must state the specific cause of the total coliform-positive sample and what action the system has taken, or will take, to correct this problem. The department may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative or because of poor sampling technique.

- (2) Laboratory invalidation. A laboratory must invalidate a total coliform sample (unless total coliforms are detected, in which case the sample is valid) if the sample produces a turbid culture in the absence of gas production using an analytical method where gas formation is examined (e.g., the multiple-tube fermentation technique), produces a turbid culture in the absence of an acid reaction in the presence-absence (P-A) coliform test, or exhibits confluent growth or produces colonies too numerous to count with an analytical method using a membrane filter (e.g., membrane filter technique). If a laboratory invalidates a sample because of such interference, the system must collect another sample from the same location as that of the original sample within 24 hours of being notified of the interference problem and must have the sample analyzed for the presence of total coliforms. The system must continue to resample within 24 hours and have the samples analyzed until a valid result is obtained. The department may waive the 24-hour time limit on a case-by-case basis.

- e. Routine monitoring for specific groundwater noncommunity water systems serving 1,000 or fewer people.* This paragraph applies to noncommunity water systems using only groundwater (not IGW) as a source and serving 1,000 or fewer people. Groundwater noncommunity water systems that serve schools, preschools, and child care facilities, and all public water systems owned or managed by state agencies, such as parks and rest areas, must monitor at the same frequency as a like-sized community water system, in accordance with 41.2(1)"f," 41.2(1)"g," or 41.2(1)"h."

- (1) General. Following any total coliform-positive sample taken under 41.2(1)"e," systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in 41.2(1)"j." Once all monitoring required by 41.2(1)"e" and 41.2(1)"j" for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in 41.2(1)"l" have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by 41.2(1)"l."

- (2) Monitoring frequency for total coliforms. Systems must monitor each calendar quarter that the system provides water to the public, with the following exceptions:

1. A system on quarterly monitoring that experiences any of the following events must begin monthly monitoring in the month following the event. The system must continue on monthly monitoring until the system meets the requirements for returning to quarterly monitoring.

- The system has an *E. coli* MCL violation.
- The system triggers one Level 2 assessment under the provisions of 41.2(1)“l” in a rolling 12-month period.
- The system triggers two Level 1 assessments under the provisions of 41.2(1)“l” in a rolling 12-month period.
- The system has a coliform treatment technique violation.
- The system has two coliform monitoring violations in a rolling 12-month period.
- The system has one monitoring coliform violation and one Level 1 assessment under the provisions of 41.2(1)“l” in a rolling 12-month period.

2. A system on monthly monitoring for reasons other than those identified in 41.2(1)“e”(2)“1” is not considered to be on increased monitoring for the purposes of 41.2(1).

3. Seasonal systems must sample each month in which they are in operation. All seasonal systems must also demonstrate completion of a department-approved start-up procedure before serving water to the public, which includes a requirement for a coliform-negative start-up sample.

(3) Evaluation of sampling frequency during a sanitary survey. During each sanitary survey, the department must evaluate the status of the system including the distribution system, to determine whether the system is on an appropriate monitoring schedule. The department may modify the system’s monitoring schedule, as necessary, or may allow the system to stay on its existing monitoring schedule, consistent with the provisions of 41.2(1)“e.”

(4) Requirements for returning from monthly to quarterly sampling frequency for nonseasonal noncommunity systems. The department may reduce the monitoring frequency for a nonseasonal noncommunity system on monthly monitoring triggered under 41.2(1)“e”(2)“1” to quarterly monitoring if the system meets the following criteria. For the purposes of 41.2(1)“e”(4), “protected water source” means the well meets separation distances from sources of microbial contamination pursuant to 567—subrule 43.3(7), Table A; or the system has 4-log virus inactivation treatment that is approved by the department and is in continuous usage.

1. Within the previous 12 months, the system must have a completed sanitary survey or voluntary Level 2 assessment, be free of sanitary defects, and have a protected water source;

2. The system must have a clean compliance history for a minimum of the previous 12 months; and

3. The department must review the approved sampling plan, which must designate the time period(s) for monitoring based on site-specific considerations (e.g., during periods of highest demand or highest vulnerability to contamination). The system must collect compliance samples during these time periods.

(5) Additional routine monitoring for systems on quarterly sampling in the month following a total coliform-positive routine sample. Systems collecting samples on a quarterly frequency must conduct additional routine monitoring the month following one or more total coliform-positive samples (with or without a Level 1 treatment technique trigger). Systems must collect at least three routine samples during the next month. Systems may either collect samples at regular time intervals throughout the month or may collect all required routine samples on a single day if samples are taken from different sites. Systems must use the results of additional routine samples in coliform treatment technique trigger calculations under 41.2(1)“l.”

f. Routine monitoring for groundwater community water systems serving 1,000 or fewer people. This paragraph applies to community water systems using only groundwater (not IGW) as a source and serving 1,000 or fewer people.

(1) General. Following any total coliform-positive sample taken under 41.2(1)“f,” systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in 41.2(1)“j.” Once all monitoring required by 41.2(1)“f” and 41.2(1)“j” for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in 41.2(1)“l” have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by 41.2(1)“l.”

(2) Monitoring frequency for total coliforms. The routine monitoring frequency for total coliforms is one sample per month.

g. Routine monitoring requirements for SW/IGW public water systems serving 1,000 or fewer people. This paragraph applies to all public water supply systems serving 1,000 or fewer people that use surface water/influenced groundwater sources, including consecutive systems.

(1) General. Following any total coliform-positive sample taken under 41.2(1)“g,” systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in 41.2(1)“j.” Once all monitoring required by 41.2(1)“g” and 41.2(1)“j” for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in 41.2(1)“l” have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by 41.2(1)“l.”

(2) Monitoring frequency for total coliforms. The routine monitoring frequency for total coliforms is one sample per month. Systems may not reduce monitoring frequency.

(3) Seasonal systems must sample each month in which they are in operation, and the monitoring frequency cannot be reduced. All seasonal systems must also demonstrate completion of a department-approved start-up procedure before serving water to the public, which includes a requirement for a coliform-negative start-up sample.

h. Routine monitoring requirements for public water systems serving more than 1,000 people. The provisions of this paragraph apply to all public water systems serving more than 1,000 people except regional water systems. The requirements for regional water systems are listed in 41.2(1)“i.”

(1) General. Following any total coliform-positive sample taken under 41.2(1)“h,” systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in 41.2(1)“j.” Once all monitoring required by 41.2(1)“h” and 41.2(1)“l” for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in 41.2(1)“l” have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by 41.2(1)“l.”

(2) Monitoring frequency for total coliforms. The routine monitoring frequency for total coliforms is based upon the population served by the system, as follows:

| Population Served | Minimum Number of Routine Samples per Month |
|-------------------|---|
| 1,001 to 2,500 | 2 |
| 2,501 to 3,300 | 3 |
| 3,301 to 4,100 | 4 |
| 4,101 to 4,900 | 5 |
| 4,901 to 5,800 | 6 |
| 5,801 to 6,700 | 7 |
| 6,701 to 7,600 | 8 |
| 7,601 to 8,500 | 9 |
| 8,501 to 12,900 | 10 |
| 12,901 to 17,200 | 15 |
| 17,201 to 21,500 | 20 |
| 21,501 to 25,000 | 25 |
| 25,001 to 33,000 | 30 |
| 33,001 to 41,000 | 40 |
| 41,001 to 50,000 | 50 |
| 50,001 to 59,000 | 60 |
| 59,001 to 70,000 | 70 |
| 70,001 to 83,000 | 80 |

| Population Served | Minimum Number of Routine Samples per Month |
|----------------------|---|
| 83,001 to 96,000 | 90 |
| 96,001 to 130,000 | 100 |
| 130,001 to 220,000 | 120 |
| 220,001 to 320,000 | 150 |
| 320,001 to 450,000 | 180 |
| 450,001 to 600,000 | 210 |
| 600,001 to 780,000 | 240 |
| 780,001 to 970,000 | 270 |
| 970,001 to 1,230,000 | 300 |

(3) Seasonal systems must sample each month in which they are in operation, and the monitoring frequency cannot be reduced. All seasonal systems must also demonstrate completion of a department-approved start-up procedure before serving water to the public, which includes a requirement for a coliform-negative start-up sample.

(4) Reduced monitoring. Community systems may not reduce the number of required routine samples.

(5) Increased monitoring. If the department, on the basis of a sanitary survey or monitoring results history, determines that some greater frequency of monitoring is more appropriate, that frequency shall be the frequency required under these rules. The increased frequency shall be confirmed or changed on the basis of subsequent surveys.

i. Routine monitoring requirements for regional public water systems. The provisions of 41.2(1)“i” apply to all regional water systems. The supplier of water for a regional water system as defined in 567—40.2(455B) shall sample for coliform bacteria at a frequency based upon the miles of pipe in its distribution system.

(1) General. Following any total coliform-positive sample taken under 41.2(1)“i,” systems must comply with the repeat monitoring requirements and *E. coli* analytical requirements in 41.2(1)“j.” Once all monitoring required by 41.2(1)“i” and 41.2(1)“j” for a calendar month has been completed, systems must determine whether any coliform treatment technique triggers specified in 41.2(1)“l” have been exceeded. If any trigger has been exceeded, systems must complete assessments as required by 41.2(1)“l.”

(2) Monitoring frequency for total coliforms. The routine monitoring frequency for total coliforms is based upon the miles of pipe in the system’s distribution system, as indicated in the following chart. In no case shall the sampling frequency for a regional water system be less than as set forth in 41.2(1)“h” based upon the population equivalent served. The following chart represents sampling frequency per miles of pipe in the distribution system and is determined by calculating one-half the square root of the miles of pipe.

| Miles of Pipe | Minimum Number of Routine Samples per Month |
|---------------|---|
| 0 – 9 | 1 |
| 10 – 25 | 2 |
| 26 – 49 | 3 |
| 50 – 81 | 4 |
| 82 – 121 | 5 |
| 122 – 169 | 6 |

| Miles of Pipe | Minimum Number of Routine Samples per Month |
|-------------------|---|
| 170 – 225 | 7 |
| 226 – 289 | 8 |
| 290 – 361 | 9 |
| 362 – 441 | 10 |
| 442 – 529 | 11 |
| 530 – 625 | 12 |
| 626 – 729 | 13 |
| 730 – 841 | 14 |
| 842 – 961 | 15 |
| 962 – 1,089 | 16 |
| 1,090 – 1,225 | 17 |
| 1,226 – 1,364 | 18 |
| 1,365 – 1,521 | 19 |
| 1,522 – 1,681 | 20 |
| 1,682 – 1,849 | 21 |
| 1,850 – 2,025 | 22 |
| 2,026 – 2,209 | 23 |
| 2,210 – 2,401 | 24 |
| 2,402 – 2,601 | 25 |
| 2,602 – 2,809 | 26 |
| 2,810 – 3,025 | 27 |
| 3,026 – 3,249 | 28 |
| 3,250 – 3,481 | 29 |
| 3,482 – 3,721 | 30 |
| 3,722 – 3,969 | 31 |
| 3,970 – 4,225 | 32 |
| 4,226 – 4,489 | 33 |
| 4,490 – 4,671 | 34 |
| 4,672 – 5,041 | 35 |
| 5,042 – 5,329 | 36 |
| 5,330 – 5,625 | 37 |
| 5,626 – 5,929 | 38 |
| 5,930 – 6,241 | 39 |
| 6,242 – 6,561 | 40 |
| 6,562 and greater | 41 |

(3) Reduced monitoring. Regional water systems may not reduce the number of required routine samples.

(4) Increased monitoring. If the department, on the basis of a sanitary survey or monitoring results history, determines that some greater frequency of monitoring is more appropriate, that frequency shall be the frequency required under these rules. The increased frequency shall be confirmed or changed on the basis of subsequent surveys.

j. Repeat monitoring. If a routine sample taken under 41.2(1)“e” through 41.2(1)“i” is total coliform-positive, the system must collect a set of repeat samples. The department cannot waive the requirement for a system to collect repeat samples.

(1) The system must collect no fewer than three repeat samples for each total coliform-positive routine sample found.

(2) The system must collect the repeat samples within 24 hours of being notified of the positive routine sample result. The department may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. In the case of an extension, the department must specify how much time the system has to collect the repeat samples.

(3) The system must collect all repeat samples on the same day, except that the department may allow a system with a single service connection to collect the required set of repeat samples over a three-day period. “System with a single service connection” means a system which supplies drinking water to consumers through a single service line.

(4) The system must collect an additional set of repeat samples in the manner specified in 41.2(1)“j”(1) to (3) if one or more repeat samples in the current set of repeat samples is total coliform-positive. The system must collect the additional set of repeat samples within 24 hours of being notified of the positive result, unless the department extends the limit as provided in 41.2(1)“j”(2). The system must continue to collect additional sets of repeat samples until either total coliforms are not detected in one complete set of repeat samples or the system determines that a coliform treatment technique trigger specified in 41.2(1)“l” has been exceeded as a result of a total coliform-positive repeat sample and notifies the department. If a trigger identified in 41.2(1)“l” is exceeded as a result of a total coliform-positive routine sample, systems are required to conduct only one round of repeat monitoring for each total coliform-positive routine sample.

(5) Results of all routine and repeat samples taken under 41.2(1)“e” through 41.2(1)“i” that are not invalidated by the department must be used to determine whether a coliform treatment technique trigger specified in 41.2(1)“l” has been exceeded.

k. E. coli testing requirements.

(1) If any routine or repeat sample is total coliform-positive, the system must analyze that total coliform-positive culture medium to determine the presence of *E. coli*. If *E. coli* are present, the system must notify the department by the end of the same day when the system is notified of the test result. If the notification is outside of the department’s routine office hours, the system shall call the department’s Environmental Emergency Reporting Hotline at (515)725-8694.

(2) The department has the discretion to allow a system, on a case-by-case basis, to forgo *E. coli* testing on a total coliform-positive sample if that system assumes that the total coliform-positive sample is *E. coli*-positive. Accordingly, the system must notify the department as specified in 41.2(1)“k”(1), and the provisions of 41.2(1)“a” apply.

l. Coliform treatment technique triggers. Systems must conduct assessments in accordance with 41.2(1)“m” after exceeding any treatment technique trigger.

(1) Level 1 treatment technique triggers.

1. For systems taking 40 or more samples per month, the system exceeds 5.0 percent total coliform-positive samples for the month.

2. For systems taking fewer than 40 samples per month, the system has two or more total coliform-positive samples in the same month.

3. The system fails to take every required repeat sample after any single total coliform-positive sample.

(2) Level 2 treatment technique triggers.

1. An *E. coli* MCL violation, as specified in 41.2(1)“p”(1).

2. A second Level 1 trigger as defined in 41.2(1)“l”(1) within a rolling 12-month period, unless the department has determined a likely reason that the samples that caused the first Level 1 treatment technique trigger were total coliform-positive and has established that the system has corrected the problem.

m. Assessment requirements. Systems must ensure that Level 1 and 2 assessments are conducted in order to identify the possible presence of sanitary defects and defects in distribution system coliform monitoring practices. Level 1 assessments may be conducted by the system owner or operator. Level 2 assessments must be conducted by the department with the assistance of the system owner or operator.

(1) General. When conducting assessments, systems must ensure that the assessor evaluates minimum elements that include review and identification of inadequacies in sample sites; sampling protocol; sample processing; atypical events that could affect distributed water quality or indicate that distributed water quality was impaired; changes in distribution system maintenance and operation that could affect distributed water quality (including water storage); source and treatment considerations that bear on distributed water quality, where appropriate (e.g., small groundwater systems); and existing water quality monitoring data. The system must conduct the assessment consistent with any department directives that tailor specific assessment elements with respect to the size and type of the system, and the size type, and characteristics of the distribution system.

(2) Level 1 assessment. A system must conduct a Level 1 assessment consistent with the department requirements if the system exceeds one of the treatment technique triggers in 41.2(1)“l”(1).

1. The system must complete the Level 1 assessment as soon as practical after any trigger in 41.2(1)“l”(1). In the completed assessment form, the system must describe sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. The system may also note on the assessment form that no sanitary defects were identified. The system must submit the completed Level 1 assessment form to the department within 30 days after the system learns that it has exceeded a trigger.

2. If the department reviews the completed Level 1 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the department must consult with the system. If the department requires revisions after consultation, the system must submit a revised assessment form to the department on an agreed-upon schedule not to exceed 30 days from the date of the consultation.

3. Upon completion and submission of the assessment form by the system, the department must determine if the system has identified the likely cause for the Level 1 trigger and, if so, establish that the system has corrected the problem or has included a schedule acceptable to the department for correction of the problem.

(3) Level 2 assessment. A system must ensure that a Level 2 assessment is conducted if the system exceeds one of the treatment technique triggers in 41.2(1)“l”(2). The system must comply with any expedited actions or additional actions required by the department in the case of an *E. coli* MCL violation.

1. The system must ensure that a Level 2 assessment is completed by the department as soon as practical after any trigger in 41.2(1)“l”(2). The system must submit a completed Level 2 assessment form to the department within 30 days after the system learns that it has exceeded a trigger. The assessment form must contain a description of the sanitary defects detected, corrective actions completed, and a proposed timetable for any corrective actions not already completed. It may also be noted on the assessment form that no sanitary defects were identified.

2. If the department reviews the completed Level 2 assessment and determines that the assessment is not sufficient (including any proposed timetable for any corrective actions not already completed), the department must consult with the system. If the department requires revisions after consultation, the system must submit a revised assessment form to the department on an agreed-upon schedule not to exceed 30 days.

3. Upon completion and submission of the assessment form by the system, the department must determine if the system has identified the likely cause for the Level 2 trigger and determine whether the system has corrected the problem or has included a schedule acceptable to the department for correction of the problem.

(4) Corrective actions. A system must correct sanitary defects found through either a Level 1 or 2 assessment conducted under 41.2(1)“l.” For corrections not completed by the time of submission of the assessment form, the system must complete the corrective action(s) in compliance with a timetable

approved by the department in consultation with the system. The system must notify the department when each scheduled corrective action is completed.

(5) Consultation. At any time during the assessment or corrective actions phase, either the water system or the department may request a consultation with the other party to determine the appropriate actions to be taken. The system may consult with the department on all relevant information that may impact on its ability to comply with a requirement of this subrule, including the method of accomplishment, an appropriate time frame, and other relevant information.

n. Reporting requirements.

(1) *E. coli.*

1. The system must notify the department by the end of the same day when the system learns of an *E. coli*-positive violation. If the notification is outside of the department's routine office hours, the system shall call the department's Environmental Emergency Reporting Hotline at (515)725-8694.

2. The system must notify the department by the end of the same day when the system learns of the *E. coli*-positive routine sample. If the notification is outside of the department's routine office hours, the system shall call the department's Environmental Emergency Reporting Hotline at (515)725-8694.

(2) A system that has violated the treatment technique for coliforms in 41.2(1)"l" must report the violation to the department no later than the end of the next business day after it learns of the violation, and must notify the public in accordance with rule 567—42.1(455B).

(3) A system required to conduct an assessment under the provisions of 41.2(1)"l" must submit the assessment report within 30 days. The system must notify the department in accordance with 41.2(1)"m"(4) when each scheduled corrective action is completed for any corrections that were not completed by the time of submission of the assessment form.

(4) A system that has failed to comply with a coliform monitoring requirement must report the monitoring violation to the department within 10 days after the system discovers the violation, and must notify the public in accordance with rule 567—42.1(455B).

(5) A seasonal system must certify, prior to serving water to the public, that it has complied with the department-approved start-up procedure.

o. Record-keeping requirements. Additional record-keeping requirements are listed in 567—paragraph 42.5(1)"j."

p. Violations.

(1) *E. coli* MCL violation. A system is in violation of the MCL for *E. coli* when any of the following occurs, and must conduct public notice in accordance with rule 567—42.1(455B):

1. The system has an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

2. The system has a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

3. The system fails to take all required repeat samples following an *E. coli*-positive routine sample.

4. The system fails to test for *E. coli* when any repeat sample tests positive for total coliform.

(2) Treatment technique violation. A system is in violation of a treatment technique trigger when any of the following occurs, and must conduct public notice in accordance with rule 567—42.1(455B):

1. A system exceeds a treatment technique trigger specified in 41.2(1)"l" and then fails to conduct the required assessment within the time frame specified in 41.2(1)"m."

2. A system exceeds a treatment technique trigger specified in 41.2(1)"l" and then fails to conduct the required corrective actions within the time frame specified in 41.2(1)"m"(4).

3. A seasonal system fails to complete a department-approved start-up procedure prior to serving water to the public, including collection of a finished water sample that tests total coliform-negative.

(3) Monitoring violation. A system is in violation of monitoring requirements when any of the following occurs, and must conduct public notice in accordance with rule 567—42.1(455B):

1. Failure to take every required routine or additional routine sample in a compliance period.

2. Failure to analyze for *E. coli* following a total coliform-positive routine sample.

(4) Reporting violation. A system is in violation of reporting requirements when any of the following occurs, and must conduct public notice in accordance with rule 567—42.1(455B):

1. Failure to submit a monitoring report after a system properly conducts monitoring in a timely manner.
2. Failure to submit a completed assessment form after a system properly conducts an assessment in a timely manner.
3. Failure to notify the department following an *E. coli*-positive sample as required by 41.2(1) “k”(1) in a timely manner.
4. Failure to submit the certification of completion of department-approved start-up procedure by a seasonal system.

q. Best available technology (BAT). The U.S. Environmental Protection Agency (EPA) identifies, and the department has adopted, the following as the best technology, treatment techniques, or other means available for all systems in achieving compliance with the maximum contaminant level for *E. coli* in 41.2(1) “a.” The following is also identified as affordable technology, treatment techniques, or other means available to systems serving 10,000 or fewer people for achieving compliance with the *E. coli* maximum contaminant level.

(1) Well protection. Protection of wells from fecal contamination by appropriate placement and construction.

(2) Disinfectant residual. Maintenance of a disinfectant residual throughout the distribution system.

(3) Distribution system maintenance. Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs, cross-connection control, and continual maintenance of a minimum positive water pressure of 20 psi in all parts of the distribution system at all times.

(4) Filtration or disinfection. Filtration and disinfection of surface water or groundwater under the direct influence of surface water in accordance with 567—43.5(455B), 567—43.9(455B), and 567—43.10(455B), or disinfection of groundwater in accordance with rule 567—41.7(455B) using strong oxidants such as, but not limited to, chlorine, chlorine dioxide, or ozone.

(5) Wellhead protection program. For groundwater systems, compliance with the requirements of the department’s wellhead protection program.

41.2(2) *Giardia.* Reserved.

41.2(3) *Heterotrophic plate count bacteria (HPC).*

a. Applicability. All public water systems that use a surface water source or source under the direct influence of surface water must provide treatment consisting of disinfection, as specified in 567—subrule 43.5(2), and filtration treatment which complies with 567—subrule 43.5(3). The heterotrophic plate count is an alternate method to demonstrate a detectable disinfectant residual in accordance with 567—paragraph 43.5(2) “d.”

b. Maximum contaminant levels. Reserved.

c. Monitoring requirements. Reserved.

d. BAT. Reserved.

e. Analytical methodology. Public water systems shall conduct heterotrophic plate count bacteria analysis in accordance with 567—subrule 43.5(2) and the following analytical method. Measurements for heterotrophic plate count bacteria must be conducted by a laboratory certified by the department to do such analysis, when heterotrophic plate count bacteria are being measured in lieu of a detectable residual disinfectant pursuant to 567—paragraph 43.5(2) “d.” In addition, the time from sample collection to initiation of analysis may not exceed eight hours, and the systems must hold the samples below 10 degrees Celsius during transit to the laboratory.

(1) Method. The heterotrophic plate count shall be performed in accordance with one of the following methods:

1. Method 9215B Pour Plate Method, Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, 19th edition, 1995, 20th edition, 1998, 21st edition, 2005, and 22nd edition, 2012. The cited method in any of these editions may be used. Standard Methods Online method 9215 B-04 may be used.

2. SimPlate Method, “IDEXX SimPlate™ HPC Test Method for Heterotrophs in Water,” November 2000, IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, ME 04092, telephone (800)321-0207.

(2) Reporting. The public water system shall report the results of heterotrophic plate count in accordance with 567—subparagraph 42.4(3)“c”(2).

41.2(4) Macroscopic organisms and algae.

a. *Applicability.* These rules apply to both community and noncommunity public water supply systems using surface water or groundwater under direct influence of surface water as defined by 567—subrule 43.5(1).

b. *Maximum contaminant levels (MCLs) for macroscopic organisms and algae.* Finished water shall be free of any macroscopic organisms such as plankton, worms, or cysts. The finished water algal cell count shall not exceed 500 organisms per milliliter or 10 percent of the total cells found in the raw water, whichever is greater.

c. *Monitoring requirements.* Reserved.

d. *BAT.* Reserved.

e. *Analytical methodology.* Measurement of the algal cells shall be in accordance with Method 10200F: Phytoplankton Counting Techniques, Standard Methods for the Examination of Water and Wastewater, 18th edition, pp. 10-13 to 10-16. Such measurement shall be required only when the department determines on the basis of complaints or otherwise that excessive algal cells may be present. [ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.3(455B) Maximum contaminant levels (MCLs) and monitoring requirements for inorganic contaminants other than lead or copper.

41.3(1) MCLs and other requirements for inorganic contaminants.

a. *Applicability.* Maximum contaminant levels for inorganic contaminants (IOCs) specified in 41.3(1)“b” apply to community water systems and nontransient noncommunity water systems as specified herein. The maximum contaminant level specified for fluoride applies only to community water systems and nontransient noncommunity systems which primarily serve children (child care facilities and schools). The maximum contaminant levels specified for nitrate, nitrite, and total nitrate and nitrite apply to community, nontransient noncommunity, and transient noncommunity water systems. At the discretion of the department, nitrate levels not to exceed 20.0 mg/L may be allowed in a noncommunity water system if the supplier of water demonstrates to the satisfaction of the department that:

- (1) Such water will not be available to children under 6 months of age; and
- (2) The system is meeting the public notification requirements of rule 567—42.1(455B), including continuous posting of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure; and
- (3) The following public health authorities will be notified annually of nitrate levels that exceed 10 mg/L, in addition to the reporting requirements of 567—Chapters 41 and 42: county board of health, county health department, county sanitarian, county public health administrator, and Iowa department of public health; and
- (4) No adverse health effects shall result.

The requirements also contain monitoring requirements, best available technology (BAT) identification, and analytical method requirements pursuant to 41.3(1)“c,” and 567—paragraphs 41.3(1)“e” and 43.3(10)“b,” respectively.

b. *Maximum contaminant levels for inorganic chemicals (IOCs).*

- (1) IOC MCLs. The following table specifies the MCLs for IOCs:

| Contaminant | EPA Contaminant Code | Maximum Contaminant Level (mg/L) |
|---------------------------|----------------------|--|
| Antimony | 1074 | 0.006 |
| Arsenic* | 1005 | 0.010 |
| Asbestos | 1094 | 7 million fibers/liter (longer than 10 micrometers in length) |
| Barium | 1010 | 2 |
| Beryllium | 1075 | 0.004 |
| Cadmium | 1015 | 0.005 |
| Chromium | 1020 | 0.1 |
| Cyanide (as free Cyanide) | 1024 | 0.2 |
| Fluoride** | 1025 | 4.0 |
| Mercury | 1035 | 0.002 |
| Nitrate | 1040 | 10 (as nitrogen) |
| Nitrite | 1041 | 1.0 (as nitrogen) |
| Total Nitrate and Nitrite | 1038 | 10 (as nitrogen) |
| Selenium | 1045 | 0.05 |
| Thallium | 1085 | 0.002 |

*The arsenic MCL changed from 0.05 mg/L to 0.010 mg/L on January 23, 2006.

**The recommended fluoride level is 0.7 milligrams per liter as published by the U.S. Department of Health and Human Services, Public Health Service (July-August 2015). At this optimum level in drinking water, fluoride has been shown to have beneficial effects in reducing the occurrence of tooth decay.

(2) Compliance calculations. Compliance with 41.3(1) "b"(1) shall be determined based on the analytical result(s) obtained at each source/entry point. When the department requires a system to collect nitrate or nitrite samples in its distribution system, compliance with 41.3(1) "b"(1) shall also be determined based on the analytical result(s) obtained at each discrete sampling point in the distribution system. Arsenic sampling results must be reported to the nearest 0.001 mg/L.

1. Sampling frequencies greater than annual (e.g., monthly or quarterly). For public water supply systems which are conducting monitoring at a frequency greater than annual, compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium is determined by a running annual average at any sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

2. Sampling frequencies of annual or less. For public water supply systems which are monitoring annually, or less frequently, the system is out of compliance with the maximum contaminant levels for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the department, it must be collected as soon as possible from the same sampling location, but not to exceed two weeks, and the determination of compliance will be based on the average of the two samples. If a system fails to collect the required number of samples, compliance (average concentration) will be based on the total number of samples collected.

3. Compliance calculations for nitrate and nitrite. Compliance with the maximum contaminant levels for nitrate and nitrite is determined based on one sample if the level of these contaminants is below the MCLs. If the level of nitrate or nitrite exceeds the MCLs in the initial sample, a confirmation sample may be required in accordance with 41.3(1) "c"(7)"2," and compliance shall be determined based on the average of the initial and confirmation samples.

(3) Additional requirements. The department may assign additional requirements as deemed necessary to protect the public health, including public notification requirements and earlier compliance dates than indicated in rule. When a system is not in compliance with an MCL as determined in subparagraph 41.3(1)“b”(2), the supplier of the water shall notify the department according to 567—subrule 42.4(1) and give notice to the public according to 567—42.1(455B).

c. Inorganic chemicals—monitoring requirements.

(1) Routine IOC monitoring (excluding asbestos, nitrate, and nitrite). Community public water supply systems and nontransient noncommunity water systems shall conduct monitoring to determine compliance with the MCLs specified in 41.3(1)“b” in accordance with this subrule. Transient noncommunity water systems shall conduct monitoring to determine compliance with the nitrate and nitrite maximum contaminant levels in 41.3(1)“b” as required by 41.3(1)“c”(5) and (6). All new systems or systems that use a new source of water must demonstrate compliance with the MCLs specified in 41.3(1)“b” within a period of time specified by the department. The system must also comply with the initial sampling frequencies specified by the department to ensure the system can demonstrate compliance with the MCLs. Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in paragraph 41.3(1)“c.” A source of water that is determined by the department to be a new source/entry point is considered to be a new source for the purposes of this rule.

(2) Department designated sampling schedules: Each public water system shall monitor at the time designated by the department during each compliance period. The monitoring protocol is as follows:

1. Groundwater sampling points. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a source/entry point) beginning in the compliance period starting January 1, 1993. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. Surface water sampling points. Surface water systems shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment (hereafter called a source/entry point) beginning in the compliance period starting January 1, 1993. (For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.) The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

3. Multiple sources. If a public water supply system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

4. Composite sampling. The department may reduce the total number of samples which must be analyzed by the use of compositing. In systems serving less than or equal to 3,300 persons, composite samples from a maximum of five samples are allowed, provided that the detection limit of the method used for analysis is less than one-fifth of the MCL. Compositing of samples must be done in the laboratory. If the concentration in the composite sample is greater than or equal to one-fifth of the MCL of any inorganic chemical, then a follow-up sample must be taken within 14 days at each sampling point included in the composite. These samples must be analyzed for the contaminants which exceeded one-fifth of the MCL in the composite sample. If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these duplicates instead of resampling, provided the holding time of the duplicate samples is not exceeded. The duplicate must be analyzed and the results reported to the department within 14 days after completing analysis of the composite sample. If the population served by the system is greater than 3,300 persons, then compositing may only be permitted by the department as sampling points within a single system. In systems serving less than or equal to 3,300 persons, the department may permit compositing among different systems provided the five-sample limit is maintained. Detection limits for each inorganic contaminant analytical method are contained in 41.3(1)“e”(1).

(3) Asbestos routine and repeat monitoring frequency. The frequency of monitoring conducted to determine compliance with the maximum contaminant level for asbestos specified in 41.3(1)“b” shall be conducted as follows:

1. Initial sampling frequency. Each community and nontransient noncommunity water system is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning in the compliance period starting January 1, 1993.

2. Sampling during waiver. If the public water supply system believes it is not vulnerable to either asbestos contamination in its source water or due to corrosion of asbestos-cement pipe, or both, it may apply for a waiver of the monitoring requirement in 41.3(1)“c”(3)“1.” If the department grants the waiver, the system is not required to monitor.

3. Bases of an asbestos waiver. The department may grant a waiver based on a consideration of potential asbestos contamination of the water source, the use of asbestos-cement pipe for finished water distribution, and the corrosive nature of the water.

4. Effect of an asbestos waiver. A waiver remains in effect until the completion of the three-year compliance period. Systems not receiving a waiver must monitor in accordance with 41.3(1)“c”(3)“1.”

5. Distribution system vulnerability for asbestos. A public water supply system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

6. Source water vulnerability for asbestos. A public water supply system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provision of 41.3(1)“c”(2).

7. Combined asbestos vulnerability. A public water supply system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe and under conditions where asbestos contamination is most likely to occur.

8. Exceedance of the asbestos MCL. A public water supply system which exceeds the maximum contaminant levels as determined in 41.3(1)“b” shall monitor quarterly beginning in the next quarter after the violation occurred.

9. Asbestos reliably and consistently below the MCL. The department may decrease the quarterly monitoring requirement to the frequency specified in 41.3(1)“c”(3)“1” provided the system is reliably and consistently below the maximum contaminant level. In no case can the department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

10. Grandfathered asbestos data. If monitoring data collected after January 1, 1990, are generally consistent with the requirements of 41.3(1)“c”(3), then the department may allow public water supply systems to use that data to satisfy the monitoring requirement for the initial compliance period beginning January 1, 1993.

(4) Monitoring frequency for other IOCs. The frequency of monitoring conducted to determine compliance with the maximum contaminant levels in 41.3(1)“b” for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, selenium, and thallium shall be as follows:

1. IOCs sampling frequency. Groundwater systems shall take one sample at each sampling point once every three years. Surface water systems (or combined surface/groundwater systems) shall take one sample annually at each sampling point.

2. IOC sampling waiver. The public water supply system may apply for a waiver from the monitoring frequencies specified in 41.3(1)“c”(4)“1.”

3. IOC sampling during a waiver. A condition of the waiver shall require that a public water supply system shall take a minimum of one sample while the waiver is effective. The term during which the waiver is effective shall not exceed one compliance cycle (i.e., nine years).

4. Bases of an IOC waiver and grandfathered data. The department may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since

January 1, 1990.) Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the maximum contaminant level. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed. Systems may be granted a waiver for monitoring of cyanide, provided that the department determines that the system is not vulnerable due to lack of any industrial source of cyanide.

5. Bases of the IOC sampling frequency during a waiver. In determining the appropriate reduced monitoring frequency, the department will consider: reported concentrations from all previous monitoring; the degree of variation in reported concentrations; and other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in stream flows or characteristics.

6. Effect of an IOC waiver. A decision to grant a waiver shall be made in writing and shall include the basis for the determination. The determination may be initiated by the department or upon an application by the public water supply system. The public water supply system shall specify the basis for its request. The department may review and, where appropriate, revise its determination of the appropriate monitoring frequency when the system submits new monitoring data or when other data relevant to the system's appropriate monitoring frequency become available.

7. Exceedance of an IOC MCL. Public water supply systems which exceed the maximum contaminant levels as calculated in 41.3(1)"b" shall monitor quarterly beginning in the next quarter after the violation occurred.

8. IOCs reliably and consistently below the MCL. The department may decrease the quarterly monitoring requirement to the frequencies specified in 41.3(1)"c"(4)"1" and "3" provided it has determined that the public water supply system is reliably and consistently below the maximum contaminant level. In no case can the department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(5) Routine and repeat monitoring frequency for nitrates. All public water supply systems (community; nontransient noncommunity; and transient noncommunity systems) shall monitor to determine compliance with the maximum contaminant level for nitrate in 41.3(1)"b."

1. Initial nitrate sampling. Community and nontransient noncommunity water systems served by groundwater systems shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993. Transient noncommunity water systems shall monitor annually beginning January 1, 1993.

2. Groundwater repeat nitrate sampling frequency. For community and noncommunity water systems, the repeat monitoring frequency for groundwater systems shall be:

- Quarterly for at least one year following any one sample in which the concentration is greater than or equal to 5.0 mg/L as N. The department may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than 5.0 mg/L as N.

- Monthly for at least one year following any one sample in which the concentration is greater than or equal to 10.0 mg/L as N.

3. Surface water repeat nitrate sampling frequency. For community and noncommunity water systems, the department may allow a surface water system to reduce the sampling frequency to:

- Annually if all analytical results from four consecutive quarters are less than 5.0 mg/L as N.
- Quarterly for at least one year following any one sample in which the concentration is greater than or equal to 5.0 mg/L as N. The department may allow a surface water system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than 5.0 mg/L as N.

- Monthly for at least one year following any nitrate MCL exceedance.

4. Scheduling annual nitrate repeat samples. After the initial round of quarterly sampling is completed, each community and nontransient noncommunity system which is monitoring annually shall take subsequent samples during the quarter(s) which previously resulted in the highest analytical result.

(6) Routine and repeat monitoring frequency for nitrite. All public water supply systems (community; nontransient noncommunity; and transient noncommunity systems) shall monitor to determine compliance with the maximum contaminant level for nitrite in 41.3(1)“b.”

1. Initial nitrite sampling. All public water systems shall take one sample at each sampling point in the compliance period beginning January 1, 1993, and ending December 31, 1995.

2. Nitrite repeat monitoring. After the initial sample, systems where an analytical result for nitrite is less than 0.50 mg/L as N shall monitor at the frequency specified by the department.

3. Nitrite increased monitoring. For community, nontransient noncommunity, and transient noncommunity water systems, the repeat monitoring frequency for any water system shall be:

- Quarterly for at least one year following any one sample in which the concentration is greater than or equal to 0.50 mg/L as N. The department may allow a system to reduce the sampling frequency to annually after determining the system is reliably and consistently less than 0.50 mg/L.

- Monthly for at least one year following any nitrite MCL exceedance.

4. Scheduling of annual nitrite repeat samples. Systems which are monitoring annually shall take each subsequent sample during the quarter(s) which previously resulted in the highest analytical result.

(7) Confirmation sampling.

1. Deadline for IOCs confirmation samples. Where the results of an analysis for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, or thallium indicate an exceedance of the maximum contaminant level, the department may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point.

2. Deadline for nitrate and nitrite confirmation samples. Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level and the sampling frequency is quarterly or annual, the system shall take a confirmation sample within 24 hours of the system’s receipt of notification of the analytical results of the first sample. Public water supply systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the area served by the public water system in accordance with 567—42.1(455B) Tier 1 public notice and complete an analysis of a confirmation sample within two weeks of notification of the analytical results of the first sample. Where the sampling frequency is monthly, a confirmation sample will not be used to determine compliance with the MCL.

3. Rescinded IAB 1/7/04, effective 2/11/04.

4. Compliance calculations and confirmation samples. If a required confirmation sample as collected within the time specified in 41.3(1)“c”(7)“1” is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system’s compliance in accordance with 41.3(1)“b.” The department has the discretion to invalidate results of obvious sampling errors.

(8) Designation of increased sampling frequency. The department may require more frequent monitoring than specified in 41.3(1)“c”(3) through (6) or may require confirmation samples for positive and negative results at its discretion. Public water supply systems may apply to conduct more frequent monitoring than the minimum monitoring frequencies specified in this subrule. Any increase or decrease in monitoring under this subparagraph will be designated in an operation permit or administrative order. To increase or decrease such frequency, the department shall consider the following factors:

1. Reported concentrations from previously required monitoring,

2. The degree of variation in reported concentrations,

3. Blending or treatment processes conducted for the purpose of complying with a maximum contaminant level, treatment technique, or action level, and

4. Other factors include changes in pumping rates in groundwater supplies or significant changes in the system’s configuration, operating procedures, source of water and changes in streamflows.

(9) Grandfathered data. For the initial analysis required by 41.3(1)“c,” data for surface waters acquired within one year prior to the effective date and data for groundwaters acquired within three years prior to the effective date of 41.3(1)“c” may be substituted at the discretion of the department.

d. *Best available treatment technologies (BATs) for IOCs.* Rescinded IAB 8/11/99, effective 9/15/99.

e. *Analytical methodology.*

(1) Analytical methods for IOCs. Analysis for the listed inorganic contaminants shall be conducted using the following methods, or their equivalent as determined by EPA. Criteria for analyzing arsenic, barium, beryllium, cadmium, chromium, copper, lead, nickel, selenium, sodium, and thallium with digestion or directly without digestion, and other analytical test procedures are contained in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October, 1994. This document is available from the National Technical Information Service, NTIS PB95-104766, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. The toll-free number is (800)553-6847.

INORGANIC CONTAMINANTS ANALYTICAL METHODS

| Contaminant | Methodology ¹⁵ | EPA | ASTM ³ | SM | SM Online ²⁶ | Other | Detection Limit, mg/L |
|-----------------------|--|-----------------------------------|----------------------|-----------------------------|-------------------------|-------|-----------------------|
| Antimony | Atomic absorption; furnace | | | 3113B ^{4, 27, 33} | 3113 B-04, B-10 | | 0.003 |
| | Atomic absorption; platform | 200.9 ² | | | | | 0.0008 ¹² |
| | ICP-Mass spectrometry | 200.8 ² | | | | | 0.0004 |
| | Atomic absorption; hydride | | D3697-92, 02, 07, 12 | | | | 0.001 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| Arsenic ¹⁶ | ICP-Mass spectrometry | 200.8 ² | | | | | 0.0014 |
| | Atomic absorption; platform | 200.9 ² | | | | | 0.0005 ¹⁵ |
| | Atomic absorption; furnace | | D2972-97C, 03C, 08C | 3113B ^{4, 27, 33} | 3113 B-04, B-10 | | 0.001 |
| | Atomic absorption; hydride | | D2972-97B, 03B, 08B | 3114B ^{4, 27, 33} | 3114 B-09 | | 0.001 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| Asbestos | Transmission electron microscopy | 100.1 ⁹ | | | | | 0.01 MFL |
| | Transmission electron microscopy | 100.2 ¹⁰ | | | | | |
| Barium | Inductively coupled plasma | 200.7 ² | | 3120B ^{18, 27, 33} | 3120 B-99 | | 0.002 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | |
| | Atomic absorption; direct | | | 3111D ^{4, 27, 33} | 3111 D-99 | | 0.1 |
| | Atomic absorption; furnace | | | 3113B ^{4, 27, 33} | 3113 B-04, B-10 | | 0.002 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| Beryllium | Inductively coupled plasma | 200.7 ² | | 3120B ^{18, 27, 33} | 3120 B-99 | | 0.0003 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | 0.0003 |
| | Atomic absorption; platform | 200.9 ² | | | | | 0.00002 ¹² |
| | Atomic absorption; furnace | | D3645-97B, 03B, 08B | 3113B ^{4, 27, 33} | 3113 B-04, B-10 | | 0.0002 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| Cadmium | Inductively coupled plasma | 200.7 ² | | | | | 0.001 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | |
| | Atomic absorption; platform | 200.9 ² | | | | | |
| | Atomic absorption; furnace | | | 3113B ^{4, 27, 33} | 3113 B-04, B-10 | | 0.0001 |

| Contaminant | Methodology ¹⁵ | EPA | ASTM ³ | SM | SM Online ²⁶ | Other | Detection Limit, mg/L |
|-------------|--|--|--------------------------------|---------------------------------|-------------------------|--|-----------------------|
| Chromium | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| | Inductively coupled plasma | 200.7 ² | | 3120B ^{18, 27, 33} | 3120 B-99 | | 0.007 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | |
| | Atomic absorption; platform | 200.9 ² | | | | | |
| Cyanide | Atomic absorption; furnace | | | 3113B ^{4, 27, 33} | 3113 B-04, B-10 | | 0.001 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| | Manual distillation (followed by one of the following four analytical methods:) | | D2036-98A, D2036-06A | 4500-CN-C ^{18, 27, 33} | | | |
| | Spectrophotometric; amenable ¹⁴ | | D2036-98B, D2036-06B | 4500-CN-G ^{18, 27, 33} | 4500-CN-G-99 | | 0.02 |
| | Spectrophotometric; manual ¹³ | | D2036-98A, D2036-06A | 4500-CN-E ^{18, 27, 33} | 4500-CN-E-99 | I-3300-85 ⁵ | 0.02 |
| | Spectrophotometric; semi-automated ¹³ | 335.4 ⁶ | | | | | 0.005 |
| | Selective electrode ¹³ | | | 4500-CN-F ^{18, 27, 33} | 4500-CN-F-99 | | 0.05 |
| | UV, distillation, spectrophotometric ²² | | | | | Kelada 01 ²⁰ | 0.0005 |
| | Micro distillation, flow injection, spectrophotometric ¹³ | | | | | QuikChem 10-204-00-1-X ²¹ | 0.0006 |
| | Ligand exchange with amperometry ¹⁴ | | | D6888-04 | | OIA-1677, DW ²⁵ | 0.0005 |
| Fluoride | Gas chromatography/mass spectrometry headspace | | | | | ME355.01 ²⁹ | |
| | Ion chromatography | 300.0 ⁶ , 300.1 ²³ | D4327-97, 03, 11 | 4110B ^{18, 27, 33} | 4110 B-00 | | |
| | Manual distillation; colorimetric; SPADNS | | | 4500F-B,D ^{18, 27, 33} | 4500 F-B,D-97 | | |
| | Manual electrode | | D1179-93B, 99B, D1179-04B, 10B | 4500F-C ^{18, 27, 33} | 4500 F-C-97 | | |
| | Automated electrode | | | | | 380-75WE ¹¹ | |
| | Automated alizarin | | | 4500F-E ^{18, 27, 33} | 4500 F-E-97 | 129-71W ¹¹ | |
| | Capillary ion electrophoresis | | | | | D6508, Rev. ²⁴ | |
| | Arsenite-free colorimetric; SPADNS | | | | | Hach SPADNS 2 Method 10225 ³¹ | |
| Magnesium | Atomic absorption; direct | | D511-93, 03B, 09B, 14B | 3111B ^{4, 27, 33} | 3111 B-99 | | |
| | ICP | 200.7 ¹ | | 3120B ^{18, 27, 33} | 3120 B-99 | | |
| | Complexation Titrimetric Methods | | D511-93, 03A, 09A, 14B | 3500-Mg E ⁴ | | | |
| | Ion chromatography | | D6919-03, 09 | 3500-Mg B ^{19, 27, 33} | 3500-Mg B-97 | | |

| Contaminant | Methodology ¹⁵ | EPA | ASTM ³ | SM | SM Online ²⁶ | Other | Detection Limit, mg/L |
|-------------|--|--|--------------------|---|----------------------------|--|-----------------------|
| Mercury | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| | Manual, cold vapor | 245.1 ² | D3223-97, 02, 12 | 3112B ^{4, 27, 33} | 3112 B-09 | | 0.0002 |
| Nickel | Automated, cold vapor | 245.2 ¹ | | | | | 0.0002 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | |
| | Inductively coupled plasma | 200.7 ² | | 3120B ^{18, 27, 33} | 3120 B-99 | | 0.005 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | 0.0005 |
| | Atomic absorption; platform | 200.9 ² | | | | | 0.0006 ¹² |
| Nitrate | Atomic absorption; direct | | | 3111B ^{4, 27, 33} | 3111 B-99 | | |
| | Atomic absorption; furnace | | | 3113B ^{4, 27, 33} | 3113 B-04, 10 | | 0.001 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| | Ion chromatography | 300.0 ⁶ , 300.1 ²³ | D4327-97, 03, 11 | 4110B ^{18, 27, 33} | 4110 B-00 | B-1011 ⁸ | 0.01 |
| | Automated cadmium reduction | 353.2 ⁶ | D3867-90A | 4500-NO ₃ -F ^{18, 27, 33} | 4500-NO ₃ -F-00 | | 0.05 |
| | Ion selective electrode | | | 4500-NO ₃ -D ^{18, 27, 33} | 4500-NO ₃ -D-00 | 601 ⁷ | 1 |
| | Manual cadmium reduction | | D3867-90B | 4500-NO ₃ -E ^{18, 27, 33} | 4500-NO ₃ -E-00 | | 0.01 |
| | Capillary ion electrophoresis | | | | | D6508, Rev.2 ²⁴ | 0.076 |
| | Reduction/colorimetric | | | | | Systema Easy (1-Reagent) ³⁰ NECi Nitrate-Reductase ³⁴ | |
| | Colorimetric; direct | | | | | Hach TNTplus TM 835/836 Method 10206 ³² | |
| Nitrite | Ion chromatography | 300.0 ⁶ , 300.1 ²³ | D4327-97, 03, 11 | 4110B ^{18, 27, 33} | 4110 B-00 | B-1011 ⁸ | 0.004 |
| | Automated cadmium reduction | 353.2 ⁶ | D3867-90A | 4500-NO ₃ -F ^{18, 27, 33} | 4500-NO ₃ -F-00 | | 0.05 |
| | Manual cadmium reduction | | D3867-90B | 4500-NO ₃ -E ^{18, 27, 33} | 4500-NO ₃ -E-00 | | 0.01 |
| | Spectrophotometric | | | 4500-NO ₂ -B ^{18, 27, 33} | 4500-NO ₂ -B-00 | | 0.01 |
| | Capillary ion electrophoresis | | | | | D6508, Rev. 2 ²⁴ | 0.103 |
| | Reduction/colorimetric | | | | | Systema Easy (1-Reagent) ³⁰ NECi Nitrate-Reductase ³⁴ | |
| Selenium | Atomic absorption; hydride | | D3859-98, 03A, 08A | 3114B ^{4, 27, 33} | 3114 B-09 | | 0.002 |
| | ICP-Mass spectrometry | 200.8 ² | | | | | |
| | Atomic absorption; platform | 200.9 ² | | | | | |
| | Atomic absorption; furnace | | D3859-98, 03B, 08B | 3113B ^{4, 27, 33} | 3113 B-04, 10 | | 0.002 |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |

| Contaminant | Methodology ¹⁵ | EPA | ASTM ³ | SM | SM Online ²⁶ | Other | Detection Limit, mg/L |
|-------------|--|--|-------------------|----------------------------|-------------------------|-------|-----------------------|
| Sodium | Inductively coupled plasma | 200.7 ² | D6919-03, 09 | 3111B ^{4, 27, 33} | 3111 B-99 | | |
| | Atomic absorption; direct Ion chromatography | | | | | | |
| Thallium | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Revision 4.2 ²⁸ | | | | | |
| | ICP-Mass spectrometry Atomic absorption; platform | 200.8 ² 200.9 ² | | | | | 0.0007 ¹² |

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room B102, Washington, DC 20460 (telephone: (202)566-2426); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

¹“Methods for Chemical Analysis of Water and Wastes,” EPA-600/4-79-020, March 1983. Available at NTIS, PB84-128677.

²“Methods for the Determination of Metals in Environmental Samples—Supplement I,” EPA-600/R-94-111, May 1994. Available at NTIS, PB95-125472.

³Annual Book of ASTM Standards, 1994, 1996, 1999 or 2003, Vols. 11.01 and 11.02, American Society for Testing and Materials (ASTM) International; the methods listed are the only versions that may be used. Copies may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

⁴18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, respectively, American Public Health Association; either edition may be used. Copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

⁵Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A-1, 3rd edition, 1989, Method I-3300-85. Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

⁶“Methods for the Determination of Inorganic Substances in Environmental Samples,” EPA-600-R-93-100, August 1993. Available at NTIS, PB94-120821.

⁷The procedure shall be done in accordance with the Technical Bulletin 601, “Standard Method of Test for Nitrate in Drinking Water,” July 1994, PN221890-001, Analytical Technology, Inc. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129.

⁸Method B-1011, “Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography,” August 1987. Copies may be obtained from Waters Corporation, Technical Services Division, 34 Maple Street, Milford, MA 01757; telephone: (508)482-2131.

⁹Method 100.1, “Analytical Method for Determination of Asbestos Fibers in Water,” EPA-600/4-83-043, EPA, September 1983. Available at NTIS, PB83-260471.

¹⁰Method 100.2, “Determination of Asbestos Structure Over 10 Microns in Length in Drinking Water,” EPA-600/R-94-134, June 1994. Available at NTIS, PB94-201902.

¹¹Industrial Method No. 129-71W, “Fluoride in Water and Wastewater,” December 1972, and Method No. 380-75WE, “Fluoride in Water and Wastewater,” February 1976, Technicon Industrial Systems. Copies may be obtained from Bran & Luebbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.

¹²Lower MDLs are reported using stabilized temperature graphite furnace atomic absorption.

¹³Screening method for total cyanides.

¹⁴Measures “free” cyanides when distillation, digestion, or ligand exchange is omitted.

¹⁵Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium by Method 200.7, sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony and thallium by Method 200.9, and antimony by Method 3113B, unless multiple in-furnace depositions are made.

¹⁶If ultrasonic nebulization is used in the determination of arsenic by Method 200.8, the arsenic must be in the pentavalent state to provide uniform signal response. For direct analysis of arsenic with Method 200.8 using ultrasonic nebulization, samples and standards must contain 1 mg/L of sodium hypochlorite.

¹⁷Reserved.

¹⁸The 18th, 19th, and 20th editions of Standard Methods for the Examination of Water and Wastewater, 1992, 1995, and 1998, respectively, American Public Health Association; any edition may be used, except that the versions of 3111B, 3111D, 3113B, and 3114B in the 20th edition may not be used. Copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹⁹The 20th edition of Standard Methods for the Examination of Water and Wastewater, 1998, American Public Health Association. Copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

²⁰The description for the Kelada 01 Method, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, and Thiocyanate," Revision 1.2, August 2001, EPA #821-B-01-009 for cyanide is available from NTIS PB 2001-108275. NOTE: A 450W UV lamp may be used in this method instead of the 550W lamp specified if it provides performance within the quality control acceptance criteria of the method in a given instrument. Similarly, modified flow cell configurations and flow conditions may be used in the method, provided that the quality control acceptance criteria are met.

²¹The description for the QuikChem Method 10-204-00-1-X, "Digestion and distillation of total cyanide in drinking water and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis," Revision 2.1, November 30, 2000, for cyanide is available from Lachat Instruments, 6645 W. Mill Road, Milwaukee, WI 53218, telephone (414)358-4200.

²²Measures total cyanides when UV-digestor is used, and "free" cyanides when UV-digestor is bypassed.

²³"Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Volume 1, EPA 815-R-00-014, August 2000. Available at NTIC, PB2000-106981.

²⁴Method D6508, Rev. 2, "Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte," available from Waters Corp., 34 Maple Street, Milford, MA 01757; telephone: (508)482-2131; fax: (508)482-3625.

²⁵Method OIA-1677, DW "Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," January 2004. EPA-821-R-04-001. Available from ALPKEM, a division of OI Analytical, P.O. Box 9010, College Station, TX 77542-9010.

²⁶Standard Methods Online is available at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

²⁷Standard Methods for the Examination of Water and Wastewater, 21st edition (2005). Available from American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

²⁸EPA Method 200.5, Revision 4.2: "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry," 2003. EPA/600/R-06/115. Available at www.nemi.gov.

²⁹Method ME355.01, Revision 1.0, "Determination of Cyanide in Drinking Water by GC/MS Headspace," May 26, 2009. Available at www.nemi.gov or from H & E Testing Laboratory, 221 State Street, Augusta, ME 04333; telephone: (207)287-2727.

³⁰Systea Easy (1-Reagent), "Systea Easy (1-Reagent) Nitrate Method," February 4, 2009. Available at www.nemi.gov or from Systea Scientific, LLC, 900 Jorie Blvd., Suite 35, Oak Brook, IL 60523.

³¹Hach Company Method, "Hach Company SPADNS 2 (Arsenic-free) Fluoride Method 10225 – Spectrophotometric Measurement of Fluoride in Water and Wastewater," January 2011. 5600 Lindbergh Drive, P.O. Box 389, Loveland, CO 80539. Available at www.hach.com.

³²Hach Company Method, "Hach Company TNTplus™ 835/836 Nitrate Method 10206 – Spectrophotometric Measurement of Nitrate in Water and Wastewater," January 2011. 5600 Lindbergh Drive, P.O. Box 389, Loveland, CO 80539. Available at www.hach.com.

³³Standard Methods for the Examination of Water and Wastewater, 22nd edition (2012), American Public Health Association. Available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

³⁴Nitrate Elimination Company, Inc. (NECi). "Method for Nitrate Reductase Nitrate-Nitrogen Analysis of Drinking Water," February 2016. Superior Enzymes, Inc., 334 Hecla Street, Lake Linden, MI 49945.

(2) Sampling methods for IOCs. Sample collection for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, nitrate, nitrite, selenium, and thallium under this subparagraph shall be conducted using the sample preservation, container, and maximum holding time procedures specified in the table below:

SAMPLING METHODS FOR IOCs

| Contaminant | Preservative ¹ | Container ² | Time ³ |
|------------------------------|--------------------------------|------------------------|--------------------------------------|
| Antimony | HNO ₃ | P or G | 6 months |
| Arsenic | HNO ₃ | P or G | 6 months |
| Asbestos | 4 degrees C | P or G | 48 hours for filtration ⁵ |
| Barium | HNO ₃ | P or G | 6 months |
| Beryllium | HNO ₃ | P or G | 6 months |
| Cadmium | HNO ₃ | P or G | 6 months |
| Chromium | HNO ₃ | P or G | 6 months |
| Cyanide | 4 degrees C, NaOH | P or G | 14 days |
| Fluoride | None | P or G | 1 month |
| Mercury | HNO ₃ | P or G | 28 days |
| Nickel | HNO ₃ | P or G | 6 months |
| Nitrate ⁴ | 4 degrees C | P or G | 48 hours |
| Nitrate-Nitrite ⁴ | H ₂ SO ₄ | P or G | 28 days |
| Nitrite ⁴ | 4 degrees C | P or G | 48 hours |
| Selenium | HNO ₃ | P or G | 6 months |
| Thallium | HNO ₃ | P or G | 6 months |

¹When indicated, samples must be acidified at the time of collection to pH < 2 with concentrated acid, or adjusted with sodium hydroxide to pH > 12. Samples collected for metals analysis may be preserved by acidification at the laboratory, using a 1:1 nitric acid solution (50 percent by volume), provided the shipping time and other instructions in Section 8.3 of EPA Methods 200.7, 200.8, and 200.9 are followed. When chilling is indicated, the sample must be shipped and stored at 4 degrees C or less.

²P: plastic, hard or soft; G: glass, hard or soft.

³In all cases, samples should be analyzed as soon after collection as possible. Follow additional (if any) information on preservation, containers, or holding times that is specified in the method.

⁴Nitrate may only be measured separate from nitrite in samples that have not been acidified. Measurement of acidified samples provides a total nitrate (sum of nitrate plus nitrite) concentration. Acidification of total nitrate (nitrate plus nitrite) samples must be done in the field at the time of sample collection.

⁵Instructions for containers, preservation procedures, and holding times as specified in Method 100.2 must be adhered to for all compliance analyses, including those conducted with Method 100.1.

f. Unregulated inorganic chemicals. Rescinded IAB 1/7/04, effective 2/11/04.

41.3(2) Other inorganic chemical contaminants. Reserved.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.4(455B) Lead, copper, and corrosivity.

41.4(1) Lead, copper, and corrosivity regulation by the setting of a treatment technique requirement. The lead and copper rules establish a treatment technique that includes requirements for corrosion control treatment, source water treatment, lead service line replacement, and public education. These requirements are triggered, in some cases, by lead and copper action levels measured in samples collected at consumers' taps.

a. Applicability. Unless otherwise indicated, each of the provisions of this subrule applies to community water systems and nontransient noncommunity water systems (hereinafter referred to as "water systems" or "systems").

b. Action levels.

(1) Lead action level. The lead action level is exceeded if the concentration of lead in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with 41.4(1) "c" is greater than 0.015 mg/L (i.e., if the "90th percentile" lead level is greater than 0.015 mg/L).

(2) Copper action level. The copper action level is exceeded if the concentration of copper in more than 10 percent of tap water samples collected during any monitoring period conducted in accordance with 41.4(1)“c” is greater than 1.3 mg/L (i.e., if the “90th percentile” copper level is greater than 1.3 mg/L).

(3) Calculation of 90th percentile. The 90th percentile lead and copper levels shall be computed as follows:

1. The results of all lead or copper samples taken during a monitoring period shall be placed in ascending order from the sample with the lowest concentration to the sample with the highest concentration. Each sampling result shall be assigned a number, ascending by single integers beginning with the number 1 for the sample with the lowest contaminant level. The number assigned to the sample with the highest contaminant level shall be equal to the total number of samples taken.

2. The number of samples taken during the monitoring period shall be multiplied by 0.9.

3. The contaminant concentration in the numbered sample yielded by this calculation is the 90th percentile contaminant level.

4. For water systems serving fewer than 100 people that collect five samples per monitoring period, the 90th percentile is computed by taking the average of the highest and second highest concentrations.

5. For a public water system that has been allowed by the department to collect fewer than five samples in accordance with 41.4(1)“c”(3), the sample result with the highest concentration is considered the 90th percentile value.

c. Lead and copper tap water monitoring requirements.

(1) Sample site selection.

1. General. Public water supply systems shall complete a materials evaluation of their distribution systems by the date indicated in 41.4(1)“c”(4) in order to identify a pool of sampling sites that meets the requirements of this subrule, and which is sufficiently large to ensure that the water system can collect the number of lead and copper tap samples required in 41.4(1)“c”(3). All sites from which first-draw samples are collected shall be selected from this pool of targeted sampling sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices designed to remove inorganic contaminants.

2. Information sources. A public water supply system shall use the information on lead, copper and galvanized steel that it is required to collect under 41.4(1)“f” as part of its responsibility for the special monitoring for corrosivity characteristics when conducting a materials evaluation. When an evaluation of the information collected is insufficient to locate the requisite number of lead and copper sampling sites that meet the targeting criteria in 41.4(1)“c”(1), the water system shall review all plumbing codes, permits, and records in the files of the building department(s) which indicate the plumbing materials that are installed within publicly and privately owned structures connected to the distribution system; all inspections and records of the distribution system that indicate the material composition of the service connections that connect a structure to the distribution system; and all existing water quality information, which includes the results of all prior analyses of the system or individual structures connected to the system, indicating locations that may be particularly susceptible to high lead or copper concentrations. In addition, the system shall seek to collect such information where possible in the course of its normal operations (e.g., checking service line materials when reading water meters or performing maintenance activities).

3. Tier 1 community sampling sites. The sampling sites selected for a community water system’s sampling pool (“tier 1 sampling sites”) shall consist of single-family structures that contain copper pipes with lead solder installed after 1982 or contain lead pipes; or are served by a lead service line. When multiple-family residences comprise at least 20 percent of the structures served by a water system, the system may include these types of structures in its sampling pool.

4. Tier 2 community sampling sites. Any community water system with insufficient tier 1 sampling sites shall complete its sampling pool with “tier 2 sampling sites,” consisting of buildings, including multiple-family residences that contain copper pipes with lead solder installed after 1982 or contain lead pipes; or are served by a lead service line.

5. Tier 3 community sampling sites. Any community water system with insufficient Tier 1 and Tier 2 sampling sites shall complete its sampling pool with “Tier 3 sampling sites,” consisting of single-family structures that contain copper pipes with lead solder installed before 1983. A community water system with insufficient Tier 1, Tier 2, and Tier 3 sampling sites shall complete its sampling pool with representative sites throughout the distribution system. A representative site is defined as a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

6. Tier 1 NTNC sampling sites. The sampling sites selected for a nontransient noncommunity water system (“tier 1 sampling sites”) shall consist of buildings that: contain copper pipes with lead solder installed after 1982 or contain lead pipes; or are served by a lead service line.

7. Other NTNC sampling sites. A nontransient noncommunity water system with insufficient Tier 1 sites that meet the targeting criteria in 41.4(1) “c”(1)“6” shall complete its sampling pool with sampling sites that contain copper pipes with lead solder installed before 1983. If additional sites are needed to complete the sampling pool, the NTNC system shall use representative sites throughout the distribution system. A representative site is defined as a site in which the plumbing materials used at that site would be commonly found at other sites served by the water system.

8. LSL sampling sites. Any public water supply system whose distribution system contains lead service lines shall draw 50 percent of the samples it collects during each monitoring period from sites that contain lead pipes, or copper pipes with lead solder, and 50 percent of those samples from sites served by a lead service line. A water system that cannot identify a sufficient number of sampling sites served by a lead service line shall collect first-draw samples from all of the sites identified as being served by such lines.

(2) Sample collection methods.

1. Tap samples for lead and copper collected in accordance with this subparagraph, with the exception of lead service line samples collected under 567—subrule 43.7(4) and 41.4(1) “c”(2)“5,” shall be first-draw samples.

2. First-draw tap samples for lead and copper shall be one liter in volume and have stood motionless in the plumbing system of each sampling site for at least six hours. First-draw samples from residential housing shall be collected from the cold-water kitchen tap or bathroom sink tap. First-draw samples from a nonresidential building shall be collected at an interior tap from which water is typically drawn for consumption. Non-first-draw samples collected in lieu of first-draw samples pursuant to 41.4(1) “c”(2)“5” shall be one liter in volume and shall be collected at an interior tap from which water is typically drawn for consumption. First-draw samples may be collected by the system or the system may allow residents to collect first-draw samples after instructing the residents of the sampling procedures specified in this paragraph. To avoid problems of residents handling nitric acid, acidification of first-draw samples may be done up to 14 days after the sample is collected. After acidification to resolubilize the metals, the sample must stand in the original container for the time specified in the approved EPA method before the sample can be analyzed. If a system allows residents to perform sampling, the system may not challenge, based on alleged errors in sample collection, the accuracy of sampling results.

3. Service line samples collected to determine if the service line is directly contributing lead (as described in 567—subrule 43.7(4)) shall be one liter in volume and have stood motionless in the lead service line for at least six hours and be collected at the tap after flushing the volume of water between the tap and the lead service line. The volume of water shall be calculated based on the interior diameter and length of the pipe between the tap and the lead service line; tapping directly into the lead service line; or if the sampling site is a building constructed as a single-family residence, allowing the water to run until there is a significant change in temperature which would be indicative of water that has been standing in the lead service line.

4. A public water supply system shall collect each first-draw tap sample from the same sampling site from which it collected a previous sample. If, for any reason, the water system cannot gain entry to a sampling site in order to collect a follow-up tap sample, the system may collect the follow-up tap

sample from another sampling site in its sampling pool as long as the new site meets the same targeting criteria, and is within reasonable proximity of the original site.

5. An NTNC system, or a CWS system that meets the criteria of 567—subparagraph 42.2(2)“b”(7) that does not have enough taps that can supply first-draw samples, as defined in 567—40.2(455B), may apply to the department in writing to substitute non-first-draw samples. Such systems must collect as many first-draw samples from appropriate taps as possible and identify sampling times and locations that would likely result in the longest standing time for the remaining sites. The department may waive the requirement for prior department approval of non-first-draw sample sites selected by the system, through written notification to the system.

(3) Number of samples. Water systems shall collect at least one sample during each monitoring period specified in 41.4(1)“c”(4) from the number of sites as listed in the column below titled “standard monitoring.” A system conducting reduced monitoring under 41.4(1)“c”(4) shall collect at least one sample from the number of sites specified in the column titled “reduced monitoring” during each monitoring period specified in 41.4(1)“c”(4). Such reduced monitoring sites shall be representative of the sites required for standard monitoring. A public water system that has fewer than five drinking water taps that can be used for human consumption meeting the sample site criteria of 41.4(1)“c”(1) to reach the required number of sample sites listed in 41.4(1)“c”(3) must collect at least one sample from each tap and then must collect additional samples from those taps on different days during the monitoring period to meet the required number of sites. Alternatively, the department may allow these systems to collect a number of samples less than the number of sites specified in 41.4(1)“c”(1), provided that 100 percent of all taps that can be used for human consumption are sampled. The department must approve this reduction of the minimum number of samples in writing based upon a request from the system or on-site verification by the department. The department may specify sampling locations when a system is conducting reduced monitoring.

REQUIRED NUMBER OF LEAD/COPPER SAMPLES

| System Size (Number of People Served) | Standard Monitoring (Number of Sites) | Reduced Monitoring (Number of Sites) |
|--|--|---|
| greater than 100,000 | 100 | 50 |
| 10,001 to 100,000 | 60 | 30 |
| 3,301 to 10,000 | 40 | 20 |
| 501 to 3,300 | 20 | 10 |
| 101 to 500 | 10 | 5 |
| less than or equal to 100 | 5 | 5 |

(4) Timing of monitoring.

1. Initial tap sampling. The first six-month monitoring period for small, medium-size and large systems shall begin on the following dates:

| System Size (Number of People Served) | First Six-month Monitoring Period Begins on: |
|--|--|
| greater than 50,000 (large system) | January 1, 1992 |
| 3,301 to 50,000 (medium system) | July 1, 1992 |
| less than or equal to 3,300 (small system) | July 1, 1993 |

All large systems shall monitor during two consecutive six-month periods. All small and medium-size systems shall monitor during each six-month monitoring period until the system exceeds the lead or copper action level and is, therefore, required to implement the corrosion control treatment requirements under 567—paragraph 43.7(1)“a,” in which case the system shall continue monitoring in accordance with 41.4(1)“c”(4), or the system meets the lead and copper action levels during two consecutive

six-month monitoring periods, in which case the system may reduce monitoring in accordance with 41.4(1)“c”(4).

2. Monitoring after installation of corrosion control and source water treatment. Large systems which install optimal corrosion control treatment pursuant to 567—subparagraph 43.7(1)“d”(4) shall monitor during two consecutive six-month monitoring periods by the date specified in 567—subparagraph 43.7(1)“d”(5). Small or medium-size systems which install optimal corrosion control treatment pursuant to 567—subparagraph 43.7(1)“e”(5) shall monitor during two consecutive six-month monitoring periods as specified in 567—subparagraph 43.7(1)“e”(6). Systems which install source water treatment shall monitor during two consecutive six-month monitoring periods by the date specified in 567—subparagraph 43.7(3)“a”(4).

3. Monitoring after the department specifies water quality parameter values for optimal corrosion control. After the department specifies the values for water quality control parameters under 567—paragraph 43.7(2)“f,” the system shall monitor during each subsequent six-month monitoring period, with the first monitoring period to begin on the date the department specifies the optimal values under 567—paragraph 43.7(2)“f.”

4. Reduced monitoring.

- A small or medium-size water system that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the number of lead and copper samples according to 41.4(1)“c”(3) and reduce the frequency of sampling to once per year. A small or medium-size water system collecting fewer than five samples as specified in 41.4(1)“c”(3) that meets the lead and copper action levels during each of two consecutive six-month monitoring periods may reduce the frequency of sampling to once per year. The system may not ever reduce the number of samples required below the minimum of one sample per available tap. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

- Any public water supply system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under 567—paragraph 43.7(2)“f” during each of two consecutive six-month monitoring periods may reduce the monitoring frequency to once per year and reduce the number of lead and copper samples according to 41.4(1)“c”(3), upon written approval by the department. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period. The department shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with 567—subrule 42.4(2), and shall notify the system in writing when it determines that the system is eligible to commence reduced monitoring. The department will review and, where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

- A small or medium-size water system that meets the lead and copper action levels during three consecutive years of monitoring may reduce the frequency of monitoring for lead and copper from annually to once every three years. Any water system that meets the lead action level and maintains the range of values for the water quality control parameters reflecting optimal corrosion control treatment specified by the department under 567—paragraph 43.7(2)“f” during three consecutive years of monitoring may reduce the frequency of monitoring from annually to once every three years if it receives written approval by the department. Samples collected once every three years shall be collected no later than every third calendar year. The department shall review monitoring, treatment, and other relevant information submitted by the water system in accordance with 567—subrule 42.4(2), and shall notify the system in writing when it determines that the system is eligible to reduce the monitoring frequency to once every three years. The department will review and, where appropriate, revise its determination when the system submits new monitoring or treatment data, or when other data relevant to the number and frequency of tap sampling becomes available.

- A water system that reduces the number and frequency of sampling shall collect these samples from sites included in the pool of targeted sampling sites identified in 41.4(1)“c”(1). Systems sampling annually or less frequently shall conduct the lead and copper tap sampling during the months of June

through September, unless the department, at its discretion, has approved a different sampling period. If approved by the department, the period shall be no longer than four consecutive months and must represent a time of normal operation where the highest levels of lead are most likely to occur. The department shall designate a period that represents a time of normal operation for an NTNC system that does not operate during the months of June through September, and for which the period of normal operation where the highest levels of lead are most likely to occur is not known. This sampling shall begin during the period approved or designated by the department in the calendar year immediately following the end of the second consecutive six-month monitoring period for systems initiating annual monitoring and during the three-year period following the end of the third consecutive calendar year of annual monitoring for systems initiating triennial monitoring.

Systems monitoring annually that have been collecting samples during the months of June through September and that receive department approval to alter their sample collection period must collect their next round of samples during a time period that ends no later than 21 months after the previous round of sampling.

Systems monitoring triennially that have been collecting samples during the months of June through September and that receive department approval to alter the sampling collection period must collect their next round of samples during a time period that ends no later than 45 months after the previous round of sampling.

Subsequent rounds of sampling must be collected annually or triennially, as required by 41.4(1)“c.”

Small systems that have been granted waivers pursuant to 41.4(1)“c”(7), that have been collecting samples during the months of June through September and that receive department approval to alter their sample collection period as previously stated must collect their next round of samples before the end of the nine-year period.

- Any water system that demonstrates for two consecutive six-month monitoring periods that the 90th percentile tap water level computed under 41.4(1)“b”(3) is less than or equal to 0.005 mg/L for lead and is less than or equal to 0.65 mg/L for copper may reduce the number of samples in accordance with 41.4(1)“c”(3) and reduce the frequency of sampling to once every three calendar years, if approved by the department.

- A small or medium-size water system subject to reduced monitoring that exceeds the lead or copper action level shall resume sampling according to 41.4(1)“c”(4)“3” and collect the number of samples specified for standard monitoring in 41.4(1)“c”(3). Any such system shall also conduct water quality parameter monitoring in accordance with 41.4(1)“d”(2), (3), or (4), as appropriate, during the monitoring period in which it exceeded the action level. Any such system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in 41.4(1)“c”(3) after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of 41.4(1)“c”(4)“4,” first bulleted paragraph, and may resume triennial monitoring for lead and copper at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either 41.4(1)“c”(4)“4,” third bulleted paragraph or fifth bulleted paragraph, and has received department approval.

Any water system subject to reduced monitoring frequency that fails to meet the lead action level during any four-month monitoring period or that fails to operate at or above the minimum value or within the range of values for the water quality control parameters specified by the department under 567—paragraph 43.7(2)“f” for more than nine days in any six-month period specified in 41.4(1)“d”(4) shall resume tap water sampling according to 41.4(1)“c”(4)“3,” collect the number of samples specified for standard monitoring in 41.4(1)“c”(3), and resume monitoring for water quality parameters within the distribution system in accordance with 41.4(1)“d”(4). This standard tap water sampling shall begin no later than the six-month period beginning January 1 of the calendar year following the lead action level exceedance or water quality parameter excursion. The system may resume reduced monitoring for lead and copper at the tap and for water quality parameters within the distribution system under the following conditions:

The system may resume annual monitoring for lead and copper at the tap at the reduced number of sites specified in 41.4(1)“c”(3) after it has completed two subsequent six-month rounds of monitoring

that meet the criteria of 41.4(1) "c"(4)"4," second bulleted paragraph, and upon written approval from the department to resume reduced annual monitoring. This sampling shall begin during the calendar year immediately following the end of the second consecutive six-month monitoring period.

The system may resume triennial monitoring for lead and copper at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria of either 41.4(1) "c"(4)"4," third bulleted paragraph or fifth bulleted paragraph, and upon written approval from the department to resume triennial monitoring.

The system may reduce the number of water quality parameter tap water samples required in 41.4(1) "d"(5)"1" and the sampling frequency required in 41.4(1) "d"(5)"2." Such a system may not resume triennial monitoring for water quality parameters at the tap until it demonstrates that it has requalified for triennial monitoring, pursuant to 41.4(1) "d"(5)"2."

- Any water system subject to a reduced monitoring frequency under 41.4(1) "c"(4)"4" must notify the department in writing in accordance with 567—subparagraph 42.4(2) "a"(3) of any upcoming long-term change in treatment or addition of a new source as described in that subparagraph. The department must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the system. The department may require the system to resume sampling pursuant to 41.4(1) "c"(4)"3" and collect the number of samples specified for standard monitoring under 41.4(1) "c"(3), or take other appropriate steps such as increased water quality parameter monitoring or reevaluation of its corrosion control treatment given the potentially different water quality considerations.

(5) Additional monitoring by systems. The results of any monitoring conducted in addition to the minimum requirements of 41.4(1) "c" shall be considered by the system and the department in making any determinations (i.e., calculating the 90th percentile lead or copper level) under this subrule.

(6) Invalidation of lead or copper tap water samples. A sample invalidated under this paragraph does not count toward determining the lead or copper 90th percentile levels under 41.4(1) "b"(3) or toward meeting the minimum monitoring requirements of 41.4(1) "c"(3).

1. The department may invalidate a lead or copper tap water sample if at least one of the following conditions is met:

- The laboratory establishes that improper sample analysis caused erroneous results.
- The department determines that the sample was taken from a site that did not meet the site selection criteria of 567—41.4(455B).
- The sample container was damaged in transit to the laboratory.
- There is a substantial reason to believe that the sample was subject to tampering.
- The sample is not representative of water that would be consumed from the tap.
- The department determined that a major disruption of the water flow occurred in the system or building plumbing prior to sample collection, which resulted in lead or copper levels that were not representative of the system.

2. The system must report the results of all samples to the department and all supporting documentation for samples the system believes should be invalidated.

3. To invalidate a sample under 41.4(1) "c"(6)"1," the decision and the rationale for the decision must be documented in writing. The department may not invalidate a sample solely on the grounds that a follow-up sample result is higher or lower than that of the original sample.

4. The system must collect replacement samples for any samples invalidated under subparagraph 41.4(1) "c"(6) if, after the invalidation of one or more samples, the system has too few samples to meet the minimum requirements of 41.4(1) "c"(3). Any such replacement samples must be taken as soon as possible, but no later than 20 days after the date the department invalidates the sample, or by the end of the applicable monitoring period, whichever occurs later. Replacement samples taken after the end of the applicable monitoring period shall not also be used to meet the monitoring requirements of a subsequent monitoring period. The replacement samples shall be taken at the same locations as the invalidated samples or, if that is not possible, at locations other than those already used for sampling during the monitoring period.

(7) Monitoring waivers for small systems. Any small system that meets the criteria of this subparagraph may apply to the department to reduce the frequency of monitoring for lead and copper

under subrule 41.4(1) to once every nine years if it meets all of the materials criteria specified in 41.4(1) “c”(7)“1” and the monitoring criteria specified in 41.4(1) “c”(7)“2.”

1. Materials criteria. The system must demonstrate that its distribution system and service lines and all drinking water supply plumbing, including plumbing conveying drinking water within all residences and buildings connected to the system, are free of lead-containing materials and copper-containing materials, as defined below:

- Lead. The water system must provide certification and supporting documentation to the department that the system is free of all lead-containing materials. The system does not contain any plastic pipes which contain lead plasticizers, or plastic service lines which contain lead plasticizers. The system must be free of lead service lines, lead pipes, lead soldered pipe joints, and leaded brass or bronze alloy fittings and fixtures, unless such fittings and fixtures meet the specifications of any standard established pursuant to 42 U.S.C. 300-g-6(e).

- Copper. The water system must provide certification and supporting documentation to the department that the system contains no copper pipes or copper service lines.

2. Monitoring criteria. The system must have completed at least one six-month round of standard tap water monitoring for lead and copper at sites approved by the department and from the number of sites required by 41.4(1) “c”(3), and demonstrate that the 90th percentile levels for any and all rounds of monitoring conducted since the system became free of all lead-containing and copper-containing materials meet the following criteria:

- Lead levels. The system must demonstrate that the 90th percentile lead level does not exceed 0.005 mg/L.

- Copper levels. The system must demonstrate that the 90th percentile copper level does not exceed 0.65 mg/L.

3. Department approval of waiver application. The department shall notify the system of its waiver determination in writing, including the basis of its decision and any condition of the waiver. The department may require as a waiver condition that the system conduct specific activities, such as limited monitoring and periodic outreach to customers to remind them to avoid installation of materials that would void the waiver. The system must continue monitoring for lead and copper at the tap as required by 41.4(1) “c”(4)“1” through “4,” as appropriate, until the system receives written approval for the waiver from the department.

4. Monitoring frequency of systems with waivers.

- A system must conduct tap water monitoring for lead and copper in accordance with 41.4(1) “c”(4)“4” at the reduced number of sampling sites identified in subparagraph 41.4(1) “c”(3) at least once every nine years and provide the materials certification specified in 41.4(1) “c”(7)“1” for both lead and copper to the department along with the monitoring results. Samples collected every nine years shall be collected no later than every ninth calendar year.

- A system with a waiver must notify the department in writing pursuant to 567—subparagraph 42.4(2) “a”(3) of any upcoming long-term change in treatment or addition of a new source, as described in that subparagraph. The department must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the system. The department has the authority to require the system to add or modify waiver conditions, such as to require recertification that the system is free of lead-containing and copper-containing materials or to require additional monitoring, if the department deems such modifications are necessary to address treatment or source water changes at the system.

- If a system with a waiver becomes aware that it is no longer free of lead-containing or copper-containing materials, such as from new construction or repairs, the system shall notify the department in writing no later than 60 days after becoming aware of such a change.

5. Continued eligibility. If the system continues to satisfy the requirements of 41.4(1) “c”(7)“4,” the waiver will be renewed automatically, unless any of the conditions listed below occur. A system whose waiver has been revoked may reapply for a waiver at such time as it again meets the appropriate materials and monitoring criteria of 41.4(1) “c”(7)“1” and 41.4(1) “c”(7)“2.”

- A system no longer satisfies the materials criteria of 41.4(1)“c”(7)“1,” or has a 90th percentile lead level greater than 0.005 mg/L or a 90th percentile copper level greater than 0.65 mg/L.
- The department notifies the system in writing that the waiver has been revoked, including the basis of its decision.

6. Requirements following waiver revocation. A system whose waiver has been revoked by the department is subject to the corrosion control treatment and lead and copper tap water monitoring requirements as follows:

- If the system exceeds the lead or copper action level, the system must implement corrosion control treatment in accordance with the deadlines specified in 567—paragraph 43.7(1)“e,” and any other applicable parts of 567—41.4(455B).
- If the system meets both the lead and copper action levels, the system must monitor for lead and copper at the tap no less frequently than once every three years using the reduced number of sample sites specified in subparagraph 41.4(1)“c”(3).

d. Water quality parameter monitoring requirements. All large public water supply systems (and all small and medium-size public water supply systems that exceed the lead or copper action level) shall monitor water quality parameters in addition to lead and copper in accordance with this subrule. The requirements of this subrule are summarized in the table at the end of 41.4(1)“d”(6). The water quality parameters must be reported in accordance with the monthly operation report requirements listed in 567—subrule 42.4(3).

(1) General requirements.

1. Sample collection methods. Tap samples shall be representative of water quality throughout the distribution system taking into account the number of persons served, the different sources of water, the different treatment methods employed by the system, and seasonal variability. Tap sampling under this subrule is not required to be conducted at taps targeted for lead and copper sampling under 41.4(1)“c”(1)“1.” Systems may conduct tap sampling for water quality parameters at sites used for coliform sampling. Samples collected at the entry point(s) to the distribution system shall be from locations representative of each source after treatment. If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

2. Number of samples.

- Systems shall collect two tap samples for applicable water quality parameters during each monitoring period specified in 41.4(1)“d”(2) through (5) from the following number of sites.

REQUIRED NUMBER OF SAMPLES: WATER QUALITY PARAMETERS

| System Size (Number of People Served) | Number of Sites for Water Quality Parameters |
|---------------------------------------|--|
| greater than 100,000 | 25 |
| 10,001 to 100,000 | 10 |
| 3,301 to 10,000 | 3 |
| 501 to 3,300 | 2 |
| 101 to 500 | 1 |
| less than or equal to 100 | 1 |

- Except as provided in 41.4(1)“d”(3)“3,” systems shall collect two samples for each applicable water quality parameter at each entry point to the distribution system during each six-month monitoring period specified in 41.4(1)“d”(2). During each monitoring period specified in 41.4(1)“d”(2). During each monitoring period specified in 41.4(1)“d”(3) through (5), systems shall collect one sample for each applicable water quality parameter at each entry point to the distribution system.

(2) Initial sampling. Large water systems shall measure the applicable water quality parameters as specified below at taps and at each entry point to the distribution system during each six-month monitoring period specified in 41.4(1)“c”(4)“1.” Small and medium-size systems shall measure the

applicable water quality parameters at taps and at each entry point to the distribution system during each six-month monitoring period specified in 41.4(1) "c"(4)"1" during which the system exceeds the lead or copper action level. Tap water and entry point monitoring shall include: pH; alkalinity; orthophosphate, when an inhibitor containing a phosphate compound is used; silica, when an inhibitor containing a silicate compound is used; calcium; conductivity; and water temperature.

(3) Monitoring after installation of corrosion control. Large systems which install optimal corrosion control treatment pursuant to 567—subparagraph 43.7(1) "d"(4) shall measure the water quality parameters at the locations and frequencies specified below during each six-month monitoring period specified in 41.4(1) "c"(4)"2." Small or medium-size systems which install optimal corrosion control treatment shall conduct such monitoring during each six-month monitoring period specified in 41.4(1) "c"(4)"2" in which the system exceeds the lead or copper action level.

1. Tap water monitoring shall include two samples for: pH; alkalinity; orthophosphate, when an inhibitor containing a phosphate compound is used; silica, when an inhibitor containing a silicate compound is used; calcium, when calcium carbonate stabilization is used as part of corrosion control.

2. Except as provided for in 41.4(1) "d"(3)"3," monitoring at each entry point to the distribution system shall include one sample every two weeks (biweekly) for: pH; a reading of the dosage rate of the chemical used to adjust alkalinity, and the alkalinity concentration when alkalinity is adjusted as part of optimal corrosion control; and a reading of the dosage rate of the inhibitor used, and the concentration of orthophosphate or silica (whichever is applicable) when a corrosion inhibitor is used as part of optimal corrosion control.

3. Any groundwater system can limit entry point sampling described in 41.4(1) "d"(3)"3" to those entry points that are representative of water quality and treatment conditions throughout the system. If water from untreated groundwater sources mixes with water from treated groundwater sources, the system must monitor for water quality parameters both at representative entry points receiving treatment and representative entry points receiving no treatment. Prior to the start of any monitoring under this paragraph, the system shall provide to the department written information identifying the selected entry points and documentation sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system, including information on seasonal variability.

(4) Monitoring after the department specifies water quality parameter values for optimal corrosion control. After the department specifies the values for applicable water quality control parameters reflecting optimal corrosion control treatment, all large systems shall measure the applicable water quality parameters according to 41.4(1) "d"(3) and determine compliance with the requirements of 567—paragraph 43.7(2) "g" every six months, with the first six-month period to begin on either January 1 or July 1, whichever comes first, after the department specifies the optimal values under 567—paragraph 43.7(2) "f." Any small or medium-size system shall conduct such monitoring during each monitoring period specified in 41.4(1) "c"(4)"3" in which the system exceeds the lead or copper action level. For any such small and medium-size system that is subject to a reduced monitoring frequency pursuant to 41.4(1) "c"(4)"4" at the time of the action level exceedance, the start of the applicable six-month monitoring period under this paragraph shall coincide with the end of the applicable monitoring period under 41.4(1) "c"(4)"4." Compliance with department-designated optimal water quality parameter values shall be determined as specified in 567—paragraph 43.7(2) "g."

(5) Reduced monitoring.

1. Public water supply systems that maintain the range of values for the water quality parameters reflecting optimal corrosion control treatment during each of two consecutive six-month monitoring periods under 41.4(1) "c"(4) shall continue monitoring at the entry point(s) to the distribution system as specified in 567—paragraph 43.7(2) "f." Such system may collect two tap samples for applicable water quality parameters from the following reduced number of sites during each six-month monitoring period.

REDUCED WATER QUALITY PARAMETER MONITORING

| System Size (Number of People Served) | Reduced Number of Sites for Water Quality Parameters |
|--|---|
| greater than 100,000 | 10 |
| 10,001 to 100,000 | 7 |
| 3,301 to 10,000 | 3 |
| 501 to 3,300 | 2 |
| 101 to 500 | 1 |
| less than or equal to 100 | 1 |

2. A public water system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under 567—paragraph 43.7(2)“f” during three consecutive years of monitoring may reduce the frequency with which the system collects the number of tap samples for applicable water quality parameters specified in 41.4(1)“d”(5) from every six months to annually. This sampling shall begin during the calendar year immediately following the end of the monitoring period in which the third consecutive year of six-month monitoring occurs. Any system that maintains the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under 567—paragraph 43.7(2)“f” during three consecutive years of annual monitoring may reduce the frequency with which it collects the number of tap samples for applicable water quality parameters specified in 41.4(1)“d”(5) from annually to every three years. This sampling shall begin no later than the third calendar year following the end of the monitoring period in which the third consecutive year of monitoring occurs.

A water system may reduce the frequency with which it collects tap samples for applicable water quality parameters specified in 41.4(1)“d”(5)“1” to every three years if it demonstrates during two consecutive monitoring periods that its tap water lead level at the 90th percentile is less than or equal to 0.005 mg/L, that its tap water copper level at the 90th percentile is less than or equal to 0.65 mg/L, and that it also has maintained the range of values for the water quality parameters reflecting optimal corrosion control treatment specified by the department under 567—paragraph 43.7(2)“f.” Monitoring conducted every three years shall be done no later than every third calendar year.

3. A public water system that conducts sampling annually shall collect these samples evenly throughout the year so as to reflect seasonal variability.

4. Any water system subject to the reduced monitoring frequency that fails to operate at or above the minimum value or within the range of values for the water quality parameters specified by the department under 567—paragraph 43.7(2)“f” for more than nine days in any six-month period specified in 567—paragraph 43.7(2)“g” shall resume distribution system tap water sampling in accordance with the number and frequency requirements in 41.4(1)“d”(3). Such a system may resume annual monitoring for water quality parameters at the tap at the reduced number of sites specified in 41.4(1)“d”(5)“1” after it has completed two subsequent consecutive six-month rounds of monitoring that meet the criteria of that paragraph or may resume triennial monitoring for water quality parameters at the tap at the reduced number of sites after it demonstrates through subsequent rounds of monitoring that it meets the criteria in 41.4(1)“d”(5)“2.”

(6) Additional monitoring by systems. The results of any monitoring conducted in addition to the minimum requirements of this subrule shall be considered in making any determinations (i.e., determining concentrations of water quality parameters) under this subrule or 567—subrule 43.7(2).

SUMMARY OF MONITORING REQUIREMENTS FOR WATER QUALITY PARAMETERS¹

| Monitoring Period | Location | Parameters ² | Frequency |
|---|--|--|--|
| Initial Monitoring | Taps and at entry point(s) to distribution systems | pH, alkalinity, orthophosphate or silica ³ , calcium, conductivity, temperature | Every 6 months |
| After Installation of Corrosion Control | Taps | pH, alkalinity, orthophosphate or silica ³ , calcium ⁴ | Every 6 months |
| | Entry point(s) to distribution system ⁶ | pH, alkalinity, if alkalinity is adjusted as part of corrosion control then include the chemical additive dosage rate and concentration, inhibitor dosage rate and inhibitor residual ⁵ | At least every two weeks |
| After Department Specifies Parameter Values for Optimal Corrosion Control | Taps | pH, alkalinity, orthophosphate or silica ³ , calcium ⁴ | Every 6 months |
| | Entry point(s) to distribution system ⁶ | pH, alkalinity, if alkalinity is adjusted as part of corrosion control then include the chemical additive dosage rate and concentration, inhibitor dosage rate and inhibitor residual ⁵ | At least every two weeks |
| Reduced Monitoring | Taps | pH, alkalinity, orthophosphate or silica ³ , calcium ⁴ | Every 6 months, annually ⁷ , or every 3 years ⁸ , at a reduced number of sites |
| | Entry point(s) to distribution system ⁶ | pH, alkalinity, if alkalinity is adjusted as part of corrosion control then include the chemical additive dosage rate and concentration, inhibitor dosage rate and inhibitor residual ⁵ | At least every two weeks |

¹Table is for illustrative purposes; consult the text of this subrule for precise regulatory requirements.

²Small and medium-size systems have to monitor for water quality parameters only during monitoring periods in which the system exceeds the lead or copper action level.

³Orthophosphate must be measured only when an inhibitor containing a phosphate compound is used. Silica must be measured only when an inhibitor containing silicate compound is used.

⁴Calcium must be measured only when calcium carbonate stabilization is used as part of corrosion control.

⁵Inhibitor dosage rates and inhibitor residual concentrations (orthophosphate or silica) must be measured only when an inhibitor is used.

⁶Groundwater systems may limit monitoring to representative locations throughout the systems.

⁷Water systems may reduce frequency of monitoring for water quality parameters at the tap from every six months to annually if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during three consecutive years of monitoring.

⁸Water systems may further reduce the frequency of monitoring for water quality parameters at the tap from annually to once every three years if they have maintained the range of values for water quality parameters reflecting optimal corrosion control during three consecutive years of annual monitoring. Water systems may accelerate to triennial monitoring for water quality parameters at the tap if they have maintained 90th percentile lead levels less than or equal to 0.005 mg/L, 90th percentile copper levels less than or equal to 0.65mg/L, and the range of water quality parameters designated by the department under 567—paragraph 43.7(2)“f” as representing optimal corrosion control during two consecutive six-month monitoring periods.

e. Lead and copper source water monitoring requirements.

(1) Sample location, collection methods, and number of samples.

1. A water system that fails to meet the lead or copper action level on the basis of tap samples collected in accordance with 41.4(1)“c” shall collect lead and copper source water samples in accordance with the following requirements regarding sample location, number of samples, and collection methods:

- Groundwater systems shall take a minimum of one sample at every entry point to the distribution system (source entry point) which is representative of each well after treatment. The system shall take one sample at the same source entry point unless conditions make another sampling location more representative of each source or treatment plant.

- Surface water systems and any system with a combination of surface water and groundwater shall take a minimum of one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point which is representative of each source after treatment. The system shall take each sample at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

- If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions, when water is representative of all sources being used.

2. Where the results of sampling indicate an exceedance of maximum permissible source water levels established under 567—subparagraph 43.7(3)“b”(4), the department may require that one additional sample be collected as soon as possible after the initial sample was taken (but not to exceed two weeks) at the same sampling point. If a confirmation sample is taken for lead or copper, then the results of the initial and confirmation samples shall be averaged in determining compliance with the maximum permissible levels. Lead and copper analytical results below the detection limit shall be considered to be zero. Analytical results above the detection limit but below the practical quantification level (PQL) shall either be considered as the measured value or be considered one-half the PQL.

(2) Monitoring after system exceeds tap water action level. Any system which exceeds the lead or copper action level at the tap shall collect one source water sample from each entry point to the distribution system no later than six months after the end of the monitoring period during which the lead or copper action level was exceeded. For monitoring periods that are annual or less frequent, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs or, if the department has established an alternate monitoring period, the last day of that period.

(3) Monitoring after installation of source water treatment. Any system which installs source water treatment pursuant to 567—subparagraph 43.7(3)“a”(3) shall collect an additional source water sample from each entry point to the distribution system during two consecutive six-month monitoring periods by the deadline specified.

(4) Monitoring frequency after the department specifies maximum permissible source water levels or determines that source water treatment is not needed.

1. A system shall monitor at the frequency specified below in cases where the department specifies maximum permissible source water levels under 567—subparagraph 43.7(3)“b”(4) or determines that the system is not required to install source water treatment under 567—subparagraph 43.7(3)“b”(2). A water system using only groundwater shall collect samples once during the three-year compliance period in effect when the department makes this determination. Such systems shall collect samples once during each subsequent compliance period. Triennial samples shall be collected every third calendar year. A public water system using surface water (or a combination of surface and groundwater) shall collect samples once during each year, the first annual monitoring period to begin during the year in which the department determination is made under this subparagraph.

2. A system using only groundwater is not required to conduct source water sampling for lead or copper if the system meets the action level for the specific contaminant in tap water samples during the entire source water sampling.

(5) Reduced monitoring frequency.

1. A water system using only groundwater may reduce the monitoring frequency for lead and copper in source water to once during each nine-year compliance cycle provided that the samples are collected no later than every ninth calendar year and if the system meets one of the following criteria:

- The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead or copper concentrations specified by the department in 567—subparagraph 43.7(3)“b”(4) during at least three consecutive compliance periods under 41.4(1)“e”(4)“1”; or

- The department has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive compliance periods in which sampling was conducted under 41.4(1)“e”(4)“1,” the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

2. A water system using surface water (or a combination of surface water and groundwater) may reduce the monitoring frequency in 41.4(1)“e”(4)“1” to once during each nine-year compliance cycle provided that the samples are collected no later than every ninth calendar year and if that system meets one of the following criteria:

- The system demonstrates that finished drinking water entering the distribution system has been maintained below the maximum permissible lead and copper concentrations specified by the department in 567—subparagraph 43.7(3)“b”(4) for at least three consecutive years; or

- The department has determined that source water treatment is not needed and the system demonstrates that, during at least three consecutive years, the concentration of lead in source water was less than or equal to 0.005 mg/L and the concentration of copper in source water was less than or equal to 0.65 mg/L.

3. A water system that uses a new source of water is not eligible for reduced monitoring for lead or copper until concentrations in samples collected from the new source during three consecutive monitoring periods are below the maximum permissible lead and copper concentrations specified.

f. Corrosivity monitoring protocol—special monitoring for corrosivity characteristics. Suppliers of water for community public water systems shall collect samples from a representative entry point to the water distribution system for the purpose of analysis to determine the corrosivity characteristics of the water. The determination of corrosivity characteristics of water shall only include one round of sampling, except in cases where the department concludes additional monitoring is necessary due to variability of the raw water sources. Sampling requirements and approved analytical methods are as follows:

(1) Surface water systems. Systems utilizing a surface water source either in whole or in part shall collect two samples per plant for the purpose of determining the corrosivity characteristics. One of these samples is to be collected during the midwinter months and the other during midsummer.

(2) Groundwater systems. Systems utilizing groundwater sources shall collect one sample per plant or source, except systems with multiple plants that do not alter the corrosivity characteristics identified in 41.4(1)“f”(3) or systems served by multiple wells drawing raw water from a single aquifer may, with departmental approval, be considered one treatment plant or source when determining the number of samples required.

(3) Corrosivity characteristics analytical parameters. Determination of corrosivity characteristics of water shall include measurements of pH, calcium hardness, alkalinity, temperature, total dissolved solids (total filterable residue), and calculation of the Langelier Index. In addition, sulfate and chloride monitoring may be required by the department. At the department’s discretion, the Aggressiveness Index test may be substituted for the Langelier Index test.

(4) Corrosivity indices methodology. The following methods must be used to calculate the corrosivity indices:

1. Aggressiveness Index—“ANSI/AWWA C401-93: AWWA Standard for the Selection of Asbestos Cement Pressure Pipe, 4”–16” for Water Distribution Systems,” American Water Works Association, Denver, CO.

2. Langelier Index—“Standard Methods for the Examination of Water and Wastewater,” 14th edition, American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710, (1975), Method 203, pp. 61-63.

(5) Distribution system construction materials. Community and nontransient noncommunity water supply systems shall identify whether the following construction materials are present in their distribution system and report to the department:

1. Lead from piping, solder, caulking, interior lining of distribution mains, alloys, and home plumbing.

2. Copper from piping and alloys, service lines, and home plumbing.

3. Galvanized piping, service lines, and home plumbing.

4. Ferrous piping materials such as cast iron and steel.

5. Asbestos cement pipe.

6. Vinyl lined asbestos cement pipe.

7. Coal tar lined pipes and tanks.

8. Pipe with asbestos cement lining.

g. Lead, copper, and water quality parameter analytical methods.

(1) Analytical methods. Analyses for alkalinity, calcium, conductivity, orthophosphate, pH, silica, and temperature may be performed by a Grade I, II, III, or IV certified operator meeting the requirements

of 567—Chapter 81, any person under the supervision of a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83. Analyses under this subrule for lead and copper shall only be conducted by laboratories that have been certified by the department, pursuant to 567—Chapter 83. The following methods must be used:

LEAD, COPPER AND WATER QUALITY PARAMETER ANALYTICAL METHODS

| Contaminant | Methodology ⁹ | Reference (Method Number) | | | | |
|-------------------------------------|--|--|--------------------------------------|--|---------------------------|-----------------------------|
| | | EPA | ASTM ³ | SM | SM Online ¹⁶ | USGS ⁵ or Other |
| Alkalinity | Titrimetric | | D1067-92B, 02B, 06B, 11B | 2320 B ^{11, 15, 18} | 2320 B-97 | |
| | Electrometric titration | | | | | I-1030-85 |
| Calcium | EDTA titrimetric | | D511-93A, 03A, 09A, 14A | 3500-Ca D ⁴ | 3500-Ca B-97 | |
| | Atomic absorption; direct aspiration | | D511-93B, 03B, 09B, 14B | 3500-Ca B ^{12, 15, 18} 3111 B ^{4, 15, 18} | 3500-Ca B-97 3111 B-99 | |
| | Inductively coupled plasma | 200.7 ² | | 3120 B ^{11, 15, 18} | 3120 B-99 | |
| | Ion chromatography Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Rev. 4.2 ¹⁷ | D6919-03, 09 | | | |
| Chloride | Ion chromatography | 300.0 ⁸ , 300.1 ¹³ | D4327-97, 03 | 4110 B ^{11, 15} | 4550 B-00 | |
| | Potentiometric titration | | | 4500-Cl ⁻ D ^{11, 15} | 4500-Cl ⁻ D-97 | |
| | Argentometric titration | | D512-89B (reapproved 1999), D512-04B | 4500-Cl ⁻ B ^{11, 15} | 4500-Cl ⁻ B-97 | |
| | Capillary ion electrophoresis | | | | | D6508, Rev. 2 ¹⁴ |
| Conductivity | Conductance | | D1125-95A (reapproved 1999), 14A | 2510 B ^{11, 15, 18} | 2510 B-97 | |
| Copper ⁶ | Atomic absorption; furnace technique | | D1688-95C, 02C, 07C, 12C | 3113 B ^{4, 15, 18} | 3113 B-99, 04, 10 | |
| | Atomic absorption; direct aspiration | | D1688-95A, 02A, 07A, 12A | 3111 B ^{4, 15, 18} | 3111 B-99 | |
| | Inductively coupled plasma | 200.7 ² | | 3120 B ^{11, 15, 18} | 3120 B-99 | |
| | Inductively coupled plasma; mass spectrometry | 200.8 ² | | | | |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Rev. 4.2 ¹⁷ | | | | |
| Atomic absorption; platform furnace | 200.9 ² | | | | | |

| Contaminant | Methodology ⁹ | Reference (Method Number) | | | | |
|---|---|---|------------------------------|---|---|--|
| | | EPA | ASTM ³ | SM | SM Online ¹⁶ | USGS ⁵ or Other |
| | Colorimetric | | | | | Hach Method 8026 ¹⁹ ; Hach Method 10272 ²⁰ |
| Lead ⁶ | Atomic absorption; furnace technique Inductively coupled plasma; mass spectrometry Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) Atomic absorption; platform furnace technique Differential pulse anodic stripping voltammetry | 200.8 ² 200.5, Rev. 4.2 ¹⁷ 200.9 ² | D3559-96D, 03D, 08D | 3113 B ^{4, 15, 18} | 3113 B-99, 04, 10 | Method 1001 ¹⁰ |
| pH | Electrometric | 150.1 ¹ 150.2 ¹ | D1293-95, 99, 12 | 4500-H ⁺ B ^{11, 15, 18} | 4500-H ⁺ B-00 | |
| Orthophosphate (Unfiltered, no digestion or hydrolysis) | Colorimetric, automated, ascorbic acid Colorimetric, ascorbic acid, single reagent Colorimetric, phosphomolybdate; Automated-segmented flow Automated discrete Ion chromatography Capillary ion electrophoresis | 365.1 ⁸ 300.0 ⁷ , 300.1 ¹³ | D515-88A D4327-97, 03, 11 | 4500-P F ^{11, 15, 18} 4500-P E ^{11, 15, 18} 4110 B ^{11, 15, 18} | 4500-P F-99 4500-P E-99 4110 B-00 | Thermo Fisher Discrete Analyzer ²¹ I-1602-85 I-2601-90 ⁸ I-2598-85 D6508, Rev. 2 ¹⁴ |
| Silica | Colorimetric, molybdate blue Automated-segmented flow Colorimetric Molybdosilicate Heteropoly blue Automated method for molybdate-reactive silica Inductively coupled plasma ⁶ | 200.7 ² | D859-95, 00, 05, 10 | 4500-Si D ⁴ 4500-SiO ₂ C ^{12, 15, 18} 4500-Si E ¹⁵ 4500-SiO ₂ D ^{12, 15, 18} 4500-Si F 4500-SiO ₂ E ^{12, 15, 18} 3120 B ^{11, 15, 18} | 4500-SiO ₂ C-97 4500-SiO ₂ C-97 4500-SiO ₂ D-97 4500-SiO ₂ D-97 4500-SiO ₂ E-97 3120 B-99 | I-1700-85 I-2700-85 |

| Contaminant | Methodology ⁹ | Reference (Method Number) | | | | |
|--------------------------------|--|--------------------------------|-------------------|--|------------------------------|-----------------------------|
| | | EPA | ASTM ³ | SM | SM Online ¹⁶ | USGS ⁵ or Other |
| | Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) | 200.5, Rev. 4.2 ¹⁷ | | | | |
| Sulfate | Ion chromatography | 300.07, 300.1 ¹³ | D4327-97, 03 | 4110 ^{11, 15, 18} | 4110 B-00 | |
| | Automated methylthymol blue | 375.27 | | 4500-SO ₄ F ^{11, 15} | 4500-SO ₄ -2 F-97 | |
| | Gravimetric | | | 4500-SO ₄ C ^{11, 15} | 4500-SO ₄ -2 C-97 | |
| | | | | 4500-SO ₄ D ^{11, 15} | 4500-SO ₄ -2 D-97 | |
| | Turbidimetric | | D516-90, 02, 07 | 4500-SO ₄ E ^{11, 15} | 4500-SO ₄ -2 E-97 | |
| | Capillary ion electrophoresis | | | | | D6508, Rev. 2 ¹⁴ |
| Temperature | Thermometric | | | 2550 B ^{11, 15, 18} | 2550-00, 10 | |
| Total Filterable Residue (TDS) | Gravimetric | | | 2540 C ^{11, 15} | 2540 C-97 | |

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

¹"Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983. Available at NTIS as PB84-128677.

²"Methods for the Determination of Metals in Environmental Samples," EPA-600/4-91-010, June 1991. Available at NTIS as PB91-231498.

³Annual Book of ASTM Standards, 1994, 1996, 1999, or 2003, Vols. 11.01 and 11.02, American Society for Testing and Materials, International; the methods listed are the only versions that may be used. The previous versions of D1688-95A and D1688-95C (copper), D3559-95D (lead), D1293-95 (pH), D1125-91A (conductivity), and D859-94 (silica) are also approved. These previous versions, D1688-90A, C, D3559-90D, D1293-84, D1125-91A and D859-88, respectively, are located in the Annual Book of ASTM Standards, 1994, Volume 11.01. Copies may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428 or www.astm.org.

⁴18th and 19th editions of Standard Methods for the Examination of Water and Wastewater, 1992 and 1995, respectively, American Public Health Association. Either edition may be used. Copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

⁵Techniques of Water Resources Investigation of the U.S. Geological Survey, Book 5, Chapter A-1, 3rd ed., 1989. Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

⁶Samples may not be filtered. Samples that contain less than 1 NTU (Nephelometric turbidity unit) and are properly preserved (concentrated nitric acid to pH < 2) may be analyzed directly (without digestion) for total metals; otherwise, digestion is required. When digestion is required, the total recoverable technique as defined in the method must be used.

⁷"Methods for the Determination of Inorganic Substances in Environmental Samples," EPA/600/R-93/100, August 1993. Available at NTIS as PB94-120821.

⁸"Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediments, Open File Report 93-125." Available from Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425.

⁹Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. Preconcentration may be required for direct analysis of lead by Methods 200.9, 3113B, and 3559-90D unless multiple in-furnace depositions are made.

¹⁰The description for Method 1001 is available from Palintest, Ltd., 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018; or from the Hach Company, P.O. Box 389, Loveland, CO 80538.

¹¹The 18th, 19th, and 20th editions of Standard Methods for the Examination of Water and Wastewater, 1992, 1995, and 1998, respectively, American Public Health Association. Any edition may be used, except that the versions of 3111B and 3113B in the 20th edition may not be used. Copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹²The 20th edition of Standard Methods for the Examination of Water and Wastewater, 1998, American Public Health Association. Copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹³"Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Vol. 1, EPA 815-R-00-014, August 2000. Available at NTIS, PB2000-106981.

¹⁴Method D6508, Rev. 2, "Test Method for Determination of Dissolved Inorganic Anions in Aqueous Matrices Using Capillary Ion Electrophoresis and Chromate Electrolyte," available from Waters Corp., 34 Maple Street, Milford, MA 01757; telephone: (508)482-2131.

¹⁵Standard Methods for the Examination of Water and Wastewater, 21st edition (2005), American Public Health Association. Available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹⁶Standard Methods Online is available at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

¹⁷EPA Method 200.5, Revision 4.2: "Determination of Trace Elements in Drinking Water by Axially Viewed Inductively Coupled Plasma-Atomic Emission Spectrometry," 2003. EPA/600/R-06/115. Available at www.nemi.gov.

¹⁸Standard Methods for the Examination of Water and Wastewater, 22nd edition (2012), American Public Health Association. Available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹⁹Hach Company. "Hach Method 8026 – Spectrophotometric Measurement of Copper in Finished Drinking Water," December 2015, Revision 1.2. Available from www.hach.com.

²⁰Hach Company. "Hach Method 10272 – Spectrophotometric Measurement of Copper in Finished Drinking Water," December 2015, Revision 1.2. Available from www.hach.com.

²¹Thermo Fisher. "Thermo Fisher Scientific Drinking Water Orthophosphate Method for Thermo Scientific Gallery Discrete Analyzer," February 2016. Revision 5. Thermo Fisher Scientific, Ratastie 2 01620 Vantaa, Finland.

(2) Certified laboratory requirements. Lead and copper analyses under this subrule shall only be conducted by laboratories that have been certified by the department and are in compliance with the requirements of 567—Chapter 83.

(3) All lead and copper levels measured between the practical quantitation limit (PQL) and method detection limit (MDL) must be either reported as measured or they can be reported as one-half the PQL specified for lead and copper in 567—paragraph 83.6(7) "a"(5) "2." All levels below the lead and copper MDLs must be reported as zero.

41.4(2) Lead, copper, and corrosivity regulation by the setting of an MCL. Reserved.
[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.5(455B) Organic chemicals.

41.5(1) MCLs and other requirements for organic chemicals. Maximum contaminant levels for two classes of organic chemical contaminants specified in 41.5(1) "b" apply to community water systems and nontransient noncommunity water systems as specified herein. The two referenced organic chemical classes are volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs).

The requirements also contain analytical method requirements and monitoring requirements referenced in 41.5(1) "b" and "c." Best available technology (BAT) for control of these organic contaminants is referenced in 567—paragraph 43.3(10) "a."

a. Applicability. The maximum contaminant levels for volatile and synthetic organic contaminants apply to community and nontransient noncommunity water systems. Compliance with the volatile and synthetic organic contaminant maximum contaminant level is calculated pursuant to 41.5(1) "b."

b. Maximum contaminant levels (MCLs) and analytical methodology for organic compounds. The maximum contaminant levels for organic chemicals are listed in the table in subparagraph 41.5(1) "b"(1). Analyses for the contaminants in this subrule shall be conducted using the following methods, or their

equivalent as approved by EPA. For analysis of a compliance sample, a certified laboratory must be able to achieve at least the method detection limit for the specific contaminant as listed in the following table.

(1) Table:

ORGANIC CHEMICAL CONTAMINANTS, CODES, MCLS, ANALYTICAL METHODS,
AND DETECTION LIMITS

| Contaminant | EPA Contaminant Code | MCL (mg/L) | Methodology ¹ | Detection Limit (mg/L) |
|-------------------------------------|----------------------|------------|---|------------------------|
| Volatile Organic Chemicals (VOCs): | | | | |
| Benzene | 2990 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Carbon tetrachloride | 2982 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ , 551.1 | 0.0005 |
| Chlorobenzene (mono) | 2989 | 0.1 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,2-Dichlorobenzene (ortho) | 2968 | 0.6 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,4-Dichlorobenzene (para) | 2969 | 0.075 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,2-Dichloroethane | 2980 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,1-Dichloroethylene | 2977 | 0.007 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| cis-1,2-Dichloroethylene | 2380 | 0.07 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| trans-1,2-Dichloroethylene | 2979 | 0.1 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Dichloromethane | 2964 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,2-Dichloropropane | 2983* | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Ethylbenzene | 2992 | 0.7 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Styrene | 2996 | 0.1 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Tetrachloroethylene | 2987 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ , 551.1 | 0.0005 |
| Toluene | 2991 | 1 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,1,1-Trichloroethane | 2981 | 0.2 | 502.2, 524.2, 524.3, 524.4 ⁷ , 551.1 | 0.0005 |
| Trichloroethylene | 2984 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ , 551.1 | 0.0005 |
| 1,2,4-Trichlorobenzene | 2378 | 0.07 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| 1,1,2-Trichloroethane | 2985 | 0.005 | 502.2, 524.2, 524.3, 524.4 ⁷ , 551.1 | 0.0005 |
| Vinyl chloride | 2976 | 0.002 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Xylenes (total) | 2955* | 10 | 502.2, 524.2, 524.3, 524.4 ⁷ | 0.0005 |
| Synthetic Organic Chemicals (SOCs): | | | | |
| Alachlor ³ | 2051 | 0.002 | 505, 507, 508.1, 525.2, 525.3, 551.1 | 0.0002 |
| Aldicarb | 2047 | 0.003 | 531.1, 6610 | 0.0005 |

| Contaminant | EPA Contaminant Code | MCL (mg/L) | Methodology ¹ | Detection Limit (mg/L) |
|--|----------------------|------------|--|------------------------|
| Aldicarb sulfone | 2044 | 0.002 | 531.1, 6610 | 0.0008 |
| Aldicarb sulfoxide | 2043 | 0.004 | 531.1, 6610 | 0.0005 |
| Atrazine ³ | 2050 | 0.003 | 505, 507, 508.1, 523, 525.2, 525.3, 536, 551.1, Syngenta AG-625 ⁵ | 0.0001 |
| Benzo(a)pyrene | 2306 | 0.0002 | 525.2, 525.3, 550, 550.1 | 0.00002 |
| Carbofuran | 2046 | 0.04 | 531.1, 531.2, 6610, 6610B, 6610 B-04 ² | 0.0009 |
| Chlordane ³ | 2959 | 0.002 | 505, 508, 508.1, 525.2, 525.3 | 0.0002 |
| 2,4-D ⁶ (as acids, salts, and esters) | 2105 | 0.07 | 515.1, 515.2, 515.3, 515.4, 555, D5317-93, 98 (Reapproved 2003), 6610B, 6640-B, 6640 B-01, 6640 B-06 | 0.0001 |
| Dalapon | 2031 | 0.2 | 515.1, 515.3, 515.4, 552.1, 552.2, 552.3, 557, 6640, 6610B, 6640-B, 6640 B-01, 6640 B-06 | 0.001 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 2931 | 0.0002 | 504.1, 524.3, 551.1 | 0.00002 |
| Di(2-ethylhexyl)adipate | 2035 | 0.4 | 506, 525.2, 525.3 | 0.0006 |
| Di(2-ethylhexyl)phthalate | 2039 | 0.006 | 506, 525.2, 525.3 | 0.0006 |
| Dinoseb ⁶ | 2041 | 0.007 | 515.1, 515.2, 515.3, 515.4, 555, 6610B, 6640-B, 6640 B-01, 6640 B-06 | 0.0002 |
| Diquat | 2032 | 0.02 | 549.2 | 0.0004 |
| Endothall | 2033 | 0.1 | 548.1 | 0.009 |
| Endrin ³ | 2005 | 0.002 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.00001 |
| Ethylene dibromide (EDB) | 2946 | 0.00005 | 504.1, 524.3, 551.1 | 0.00001 |
| Glyphosate | 2034 | 0.7 | 547, 6651, 6651B, 6651 B-00, 6640 B-05 | 0.006 |
| Heptachlor ³ | 2065 | 0.0004 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.00004 |
| Heptachlor epoxide ³ | 2067 | 0.0002 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.00002 |
| Hexachlorobenzene ³ | 2274 | 0.001 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.0001 |
| Hexachlorocyclopentadiene ³ | 2042 | 0.05 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.0001 |
| Lindane (gamma BHC) ³ | 2010 | 0.0002 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.00002 |
| Methoxychlor ³ | 2015 | 0.04 | 505, 508, 508.1, 525.2, 525.3, 551.1 | 0.0001 |
| Oxamyl | 2036 | 0.2 | 531.1, 531.2, 6610, 6610B, 6610 B-04 ² | 0.002 |
| Pentachlorophenol | 2326 | 0.001 | 515.1, 515.2, 515.3, 515.4, 525.2, 525.3, 555, D5317-93, 98 (Reapproved 2003), 6610B, 6640-B, 6640 B-01, 6640 B-06 | 0.00004 |

| Contaminant | EPA Contaminant Code | MCL (mg/L) | Methodology ¹ | Detection Limit (mg/L) |
|--|----------------------|--------------------|--|------------------------|
| Picloram ^{3, 6} | 2040 | 0.5 | 515.1, 515.2, 515.3, 515.4, 555, D5317-93, 98 (Reapproved 2003), 6610B, 6640-B, 6640 B-01, 6640 B-06 | 0.0001 |
| Polychlorinated biphenyls ⁴ (as decachlorobiphenyl) (as Arochlors) ³ | 2383 | 0.0005 | 508A 505, 508, 508.1, 525.2, 525.3 | 0.0001 |
| Simazine ³ | 2037 | 0.004 | 505, 507, 508.1, 523, 525.2, 525.3, 536, 551.1 | 0.00007 |
| 2,3,7,8-TCDD (dioxin) | 2063 | 3x10 ⁻⁸ | 1613 | 5x10 ⁻⁹ |
| 2,4,5-TP ⁶ (Silvex) | 2110 | 0.05 | 515.1, 515.2, 515.3, 515.4, 555, D5317-93, 98 (Reapproved 2003), 6610B, 6640-B, 6640 B-01, 6640 B-06 | 0.0002 |
| Toxaphene ³ | 2020 | 0.003 | 505, 508, 508.1, 525.2, 525.3 | 0.001 |

*As of January 1, 1999, the contaminant codes for the following compounds were changed from the Iowa Contaminant Code to the EPA Contaminant Code:

| Contaminant | Iowa Contaminant Code (Old) | EPA Contaminant Code (New) |
|---------------------|-----------------------------|----------------------------|
| 1,2 Dichloropropane | 2325 | 2983 |
| Xylenes (total) | 2974 | 2955 |

¹Analyses for the contaminants in this section shall be conducted using the following EPA methods or their equivalent as approved by EPA. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room 3334, Washington, DC 20460 (telephone: (202)566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202)741-6030, or via Internet at www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

The following methods are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847).

Methods for the Determination of Organic Compounds in Drinking Water, EPA-600/4-88-039, December 1988, Revised July 1991 (NTIS PB91-231480): Methods 508A and 515.1.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement I, EPA-600/4-90-020, July 1990 (NTIS PB91-146027): Methods 547, 550, 550.1.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement II, EPA-600/R-92-129, August 1992 (NTIS PB92-207703): Methods 548.1, 552.1, 555.

Methods for the Determination of Organic Compounds in Drinking Water—Supplement III, EPA-600/R-95-131, August 1995 (NTIS PB95-261616): Methods 502.2, 504.1, 505, 506, 507, 508, 508.1, 515.2, 524.2, 525.2, 531.1, 551.1, 552.2.

EPA Method 523, "Determination of Triazine Pesticides and Their Degradates in Drinking Water by Gas Chromatography/Mass Spectrometry (GC/MS)," 2011. EPA-815-R-11-002. Available at www.nepis.epa.gov.

EPA Method 524.3, Version 1.0. "Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry," June 2009. EPA 815-B-09-009. Available at www.nemi.gov.

EPA Method 525.3, "Determination of Semivolatile Organic Chemicals in Drinking Water by Solid Phase Extraction and Capillary Column Gas Chromatograph/Mass Spectrometry (GC/MS)," 2012. EPA/600/R-12-010. Available at www.nepis.epa.gov.

EPA Method 536, "Determination of Triazine Pesticides and Their Degradates in Drinking Water by Liquid Chromatography Electrospray Ionization Tandem Mass Spectrometry (LC/ESI-MS/MS)," 2007. EPA/815-B-07-002. Available at www.nepis.epa.gov.

EPA Method 557, "Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS)," September 2009. EPA 815-B-09-012. Available at www.nemi.gov.

Method 1613 "Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope-Dilution HRGC/HRMS," EPA-821-B-94-005, October 1994 (NTIS PB95-104774).

The following American Public Health Association (APHA) documents are available from APHA, 800 I Street, NW, Washington, DC 20001-3710.

Supplement to the 18th Edition of Standard Methods for the Examination of Water and Wastewater, 1994, Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995, 20th edition, 1998, 21st edition, 2005, or 22nd edition, 2012 (any of these editions may be used), APHA: Method 6610 and (carbofuran and oxamyl only) 6610B and 6610 B-04; Method 6640B (21st and 22nd editions only) and SM online 6640 B-01 for 2,4-D, 2,4,5-TP Silvex, dalapon, dinoseb, pentachlorophenol, and picloram; Method 6651B (21st and 22nd editions only) and SM online 6670-B-00 for glyphosate.

Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, 19th edition, 1995, or 20th edition, 1998, (any of these editions may be used), APHA: Method 6651.

The following American Society for Testing and Materials (ASTM) method is available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

Annual book of ASTM Standards, 1999, Vol. 11.02 (or any edition published after 1993), ASTM: D5317-93, 98 (Reapproved 2003).

Methods 515.3 and 549.2 are available from U.S. EPA NERL, 26 W. Martin Luther King Drive, Cincinnati, OH 45268.

Method 515.4, "Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Microextraction, Derivatization and Fast Gas Chromatography with Electron Capture Detection," Revision 1.0, April 2000, EPA 815/B-00/001 and EPA Method 552.3, "Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection," Revision 1.0, July 2003, EPA 815-B-03-002, available at www.epa.gov/safewater/methods/sourcalt.html.

Method 531.2, "Measurement of n-Methylcarbamoyloximes and n-Methylcarbamates in Water by Direct Aqueous Injection HPLC with Postcolumn Derivatization," Revision 1.0, September 2001, EPA 815/B-01/002, available at www.epa.gov/safewater/methods/sourcalt.html.

Syngenta AG-625 Method, "Atrazine in Drinking Water by Immunoassay," February 2001, is available from Syngenta Crop Protection, Inc., 410 Swing Road, P.O. Box 18300, Greensboro, NC 27419, telephone (336)632-6000.

Other required analytical test procedures germane to the conduct of these analyses are contained in Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994 (NTIS PB95-104766).

²Standard Methods Online is available at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

³Substitution of the detector specified in Method 505, 507, 508, or 508.1 for the purpose of achieving lower detection limits is allowed as follows. Either an electron capture or nitrogen-phosphorus detector may be used provided all regulatory requirements and quality control criteria are met.

⁴PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl. Users of Method 505 may have more difficulty in achieving the required detection limits than users of Method 508. 508.1, or 525.2.

⁵This method may not be used for the analysis of atrazine in any system where chlorine dioxide is used in the drinking water treatment. In samples from all other systems, any result for atrazine generated by Method AG-625 that is greater than one-half the MCL (i.e., greater than 0.0015 mg/L) must be confirmed using another approved method for this contaminant and should use additional volume of the original sample collected for compliance monitoring. In instances where a result from Method AG-625 triggers such confirmatory testing, the confirmatory result is to be used to determine compliance.

⁶Accurate determination of the chlorinated esters requires hydrolysis of the sample as described in EPA Methods 515.1, 515.2, 515.3, 515.4, and 555, and ASTM Method D5317-93, 98 (Reapproved 2003).

⁷EPA Method 524.4, Version 1.0. "Measurement of Purgeable Organic Compounds in Water by Gas Chromatography/Mass Spectrometry Using Nitrogen Purge Gas," May 2013, EPA 815-R-13-002.

(2) Organic chemical compliance calculations. Compliance with 41.5(1)"b"(1) shall be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL listed in 41.5(1)"b"(1), the system is in violation of the MCL. If a system fails to collect the required number of samples, compliance will be based on the total number of samples

collected. If a sample result is less than the detection limit, zero will be used when calculating the running annual average. If the system is in violation of an MCL, the water supplier is required to give notice to the department in accordance with 567—subrule 42.4(1) and to notify the public as required by 567—42.1(455B).

1. Systems monitoring more than once per year for VOC or SOC contaminants. For systems which monitor more than once per year, compliance with the MCL is determined by a running annual average of all samples collected at each sampling point.

2. Systems monitoring annually or less frequently for VOC contaminants. Systems which monitor annually or less frequently and whose VOC sample result exceeds the MCL must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling. However, if any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is immediately out of compliance with the MCL.

3. Systems monitoring annually or less frequently for SOC contaminants. Systems which monitor annually or less frequently and whose SOC sample result exceeds the regulatory detection limit specified in subparagraph 41.5(1)“b”(1) must begin quarterly sampling. The system will not be considered in violation of the MCL until it has completed one year of quarterly sampling. However, if any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is immediately out of compliance with the MCL.

(3) Treatment techniques for acrylamide and epichlorohydrin. Each public water supply system must certify annually in writing to the department (using third-party or manufacturer’s certification) that when acrylamide and epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed the levels specified as follows:

Acrylamide = 0.05% dosed at 1 ppm (or equivalent)

Epichlorohydrin = 0.01% dosed at 20 ppm (or equivalent)

Certifications can rely on information provided by manufacturers or third parties, as approved by the department.

c. Organic chemical monitoring requirements. Each public water system shall monitor at the time designated within each compliance period. All new systems or systems that use a new source of water must demonstrate compliance with the MCLs within the time period specified by the department. The system must also comply with the initial sampling frequencies specified by the department to ensure the system can demonstrate compliance with the MCLs. A source of water that is determined by the department to be a new source/entry point is considered to be a new source for the purposes of paragraph 41.5(1)“c.” Routine and increased monitoring frequencies shall be conducted in accordance with the requirements in this paragraph.

(1) Routine volatile organic chemical (VOC) monitoring requirements. Beginning on January 1, 1993, community water supplies and NTNC water supplies shall conduct monitoring of the contaminants listed in 41.5(1)“b”(1) for the purpose of determining compliance with the maximum contaminant level.

(2) VOC monitoring protocol.

1. VOC groundwater monitoring protocol. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a source/entry point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

2. VOC surface water monitoring protocol. Surface water systems (and combined surface/groundwater systems) shall take a minimum of one sample at each entry point to the distribution system after treatment (hereafter called a source/entry point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source, treatment plant, or within the distribution system.

3. Multiple sources. If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used). If a

representative sample of all water sources cannot be obtained, as determined by the department, separate source/entry points with the appropriate monitoring requirements will be assigned by the department.

4. Initial VOCs monitoring frequency. Each community and nontransient noncommunity water system shall take four consecutive quarterly samples for each contaminant listed in 41.5(1)“b”(1) during each compliance period, beginning in the initial compliance period. If the initial monitoring for contaminants listed in 41.5(1)“b”(1) has been completed by December 31, 1992, and the system did not detect any contaminant listed in 41.5(1)“b”(1), then each groundwater and surface water system shall take one sample annually beginning with the initial compliance period.

5. Reduced VOC monitoring for groundwater systems. After a minimum of three years of annual sampling, the department may allow groundwater systems with no previous detection of any contaminant listed in 41.5(1)“b”(1) to take one sample during each compliance period.

6. VOC monitoring waivers. Each community and nontransient noncommunity groundwater system which does not detect a contaminant listed in 41.5(1)“b”(1) may apply to the department for a waiver from the requirements of 41.5(1)“c”(2)“4” and “5” after completing the initial monitoring. A waiver shall be effective for no more than six years (two compliance periods). The department may also issue waivers to small systems for the initial round of monitoring for 1,2,4-trichlorobenzene. Detection is defined as greater than or equal to 0.0005 mg/L.

7. Bases of a VOC monitoring waiver. The department may grant a waiver if the department finds that there has not been any knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted.

- Previous analytical results.
- The proximity of the system to a potential point or nonpoint source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities.
- The environmental persistence and transport of the contaminants.
- The number of persons served by the public water system and the proximity of a smaller system to a larger system, and
- How well the water source is protected against contamination, such as whether it is a surface or groundwater system. Groundwater systems must consider factors such as depth of the well, the type of soil, and wellhead protection. Surface water systems must consider watershed protection.

8. VOC monitoring waiver requirements for groundwater systems. As a condition of the waiver, a groundwater system must take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in 41.5(1)“c”(2)“7.” Based on this vulnerability assessment the department must reconfirm that the system is nonvulnerable. If the department does not reconfirm within three years of the initial vulnerability determination, then the waiver is invalidated and the system is required to sample annually as specified in 41.5(1)“c”(2)“4.”

9. VOC monitoring waiver requirements for surface water systems. Each community and nontransient noncommunity surface water system which does not detect a contaminant listed in 41.5(1)“b”(1) may apply to the department for a waiver from the requirements of 41.5(1)“c”(2)“4” after completing the initial monitoring. Systems meeting this criterion must be determined by the department to be nonvulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the department (if any).

10. Increased VOC monitoring. If a contaminant listed in 41.5(1)“b”(1) is detected at a level exceeding 0.0005 mg/L in any sample, then:

The system must monitor quarterly at each sampling point which resulted in a detection.

The department may decrease the quarterly monitoring requirement specified in 41.5(1)“c”(2)“4” provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the department make this determination unless a groundwater system takes a

minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

If the department determines that the system is reliably and consistently below the MCL, the department may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter(s) which previously yielded the highest analytical result.

Systems which have three consecutive annual samples with no detection of a contaminant may apply to the department for a waiver as specified in 41.5(1) "c"(2)"6."

Groundwater systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the results of the first analysis do not detect vinyl chloride, the department may reduce the quarterly monitoring frequency of vinyl chloride monitoring to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the department.

11. VOCs reliably and consistently below the MCL. Systems which violate the MCL requirements of 41.5(1) "b"(1) must monitor quarterly. After a minimum of four consecutive quarterly samples which show the system is in compliance and the department determines that the system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and times specified in 41.5(1) "c"(2)"10," third unnumbered paragraph (following approval by the department).

(3) Routine and repeat synthetic organic chemical (SOC) monitoring requirements. Analysis of the synthetic organic contaminants listed in 41.5(1) "b"(1) for the purposes of determining compliance with the maximum contaminant level shall be conducted as follows:

1. SOC groundwater monitoring protocols. Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a source/entry point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

2. SOC surface water monitoring protocols. Surface water systems shall take a minimum of one sample at each entry point to the distribution system after treatment (hereafter called a source/entry point). Each sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant. For purposes of this paragraph, surface water systems include systems with a combination of surface and ground sources.

3. Multiple sources. If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used). If a representative sample of all water sources cannot be obtained, as determined by the department, separate source/entry points with the appropriate monitoring requirements will be assigned by the department.

4. SOC monitoring frequency. Community and nontransient noncommunity water systems shall take four consecutive quarterly samples for each contaminant listed in 41.5(1) "b"(1) during each compliance period beginning with the compliance period starting January 1, 1993. Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of two quarterly samples in one year during each repeat compliance period. Systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

5. SOC monitoring waivers. Each community and nontransient water system may apply to the department for a waiver from the requirements of 41.5(1) "c"(3)"4." A system must reapply for a waiver for each compliance period.

6. Bases of an SOC monitoring waiver. The department may grant a waiver if the department finds that there has been no knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the system. If previous use of the contaminant

is unknown or it has been used previously, then the department shall determine whether a waiver may be granted by considering:

- Previous analytical results.
- The proximity of the system to a potential point or nonpoint source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Nonpoint sources include the use of pesticides to control insect and weed pests on agricultural areas, forest lands, home and gardens, and other land application uses.
 - The environmental persistence and transport of the pesticide or PCBs.
 - How well the water source is protected against contamination due to such factors as depth of the well and the type of soil and the integrity of the well casing.
 - Elevated nitrate levels at the water supply source, and
 - Use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps and transformers).

7. Increased SOC monitoring. If a synthetic organic contaminant listed in 41.5(1)“b”(1) is detected in any sample, then:

- Each system must monitor quarterly at each sampling point which resulted in a detection.
- The department may decrease the quarterly SOC monitoring requirement if the system is reliably and consistently below the maximum contaminant level. In no case shall the department make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.
 - After the department determines the system is reliably and consistently below the maximum contaminant level, the system may monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.
 - Systems which have three consecutive annual samples with no detection of a contaminant may apply to the department for a waiver as specified in 41.5(1)“c”(3)“6.”
 - If monitoring results in detection of one or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb sulfoxide, heptachlor, and heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

8. MCL violation and reliably/consistently below the MCL. Systems which violate the requirements of 41.5(1)“b” must monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the department determines the system is reliably and consistently below the MCL, the system shall monitor at the frequency specified in 41.5(1)“c”(3)“7.”

(4) Organic chemical (SOC and VOC) confirmation samples. The department may require a confirmation sample for positive or negative results. If a confirmation sample is required by the department, the result must be averaged with the first sampling result and the average is used for the compliance determination as specified by 41.5(1)“b”(2). The department has discretion to disregard results of obvious sampling errors from this calculation.

(5) Grandfathered organic chemical (SOC and VOC) data. The department may allow the use of monitoring data collected after January 1, 1988, for VOCs and January 1, 1990, for SOCs required under Section 1445 of the Safe Drinking Water Act for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this subparagraph, the department may use such data (i.e., a single sample rather than four quarterly samples) to satisfy the initial monitoring requirement for the initial compliance period beginning January 1, 1993. Systems which use grandfathered samples for VOCs and did not detect any contaminants listed in 41.5(1)“b”(1) shall begin monitoring annually in accordance with 41.5(1)“c”(2) beginning January 1, 1993.

(6) Increased organic chemical (SOC and VOC) monitoring. The department may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, changes to treatment facilities or normal operation thereof).

(7) Organic chemical (SOC and VOC) vulnerability assessment criteria. Vulnerability of each public water system shall be determined by the department based upon an assessment of the following factors.

1. VOC vulnerability assessment criteria—previous monitoring results. A system will be classified vulnerable if any sample was analyzed to contain one or more contaminants listed in 41.5(1) “b”(1)-(VOCs) or 41.5(1) “b”(3) except for trihalomethanes or other demonstrated disinfection by-products.

2. SOC vulnerability assessment criteria—previous monitoring results. A system will be classified vulnerable if any sample was analyzed to contain one or more contaminants listed in 41.5(1) “b”(2)-(SOCs) or 41.5(1) “b”(3) except for trihalomethanes or other demonstrated disinfection by-products.

3. Proximity of surface water supplies to commercial or industrial use, disposal or storage of volatile synthetic organic chemicals. Surface waters which withdraw water directly from reservoirs are considered vulnerable if the drainage basin upgradient and within two miles of the shoreline at the maximum water level contains major transportation facilities such as primary highways or railroads or any of the contaminant sources listed in this subparagraph. Surface water supplies which withdraw water directly from flowing water courses are considered vulnerable if the drainage basin upgradient and within two miles of the water intake structure contains major transportation facilities such as primary highways or railroads or any of the contaminant sources listed in this subparagraph.

4. Proximity of supplies to commercial or industrial use, disposal or storage of volatile synthetic organic chemicals. Wells that are not separated from sources of contamination by at least the following distances will be considered vulnerable.

| <u>Sources of Contamination</u> | <u>Shallow Wells as defined in 567—40.2(455B)</u> | <u>Deep Wells as defined in 567—40.2(455B)</u> |
|---|---|--|
| Sanitary and industrial point discharges | 400 ft | 400 ft |
| Mechanical waste treatment plants | 400 ft | 200 ft |
| Lagoons | 1,000 ft | 400 ft |
| Chemical and mineral storage (aboveground) | 200 ft | 100 ft |
| Chemical and mineral storage including underground storage tanks on or below ground | 400 ft | 200 ft |
| Solid waste disposal site | 1,000 ft | 1,000 ft |

5. A system is deemed to be vulnerable for a period of three years after any positive measurement of one or more contaminants listed in 41.5(1) “b”(1) except for trihalomethanes or other demonstrated disinfection by-products.

(8) PCB analytical methodology. Analysis for PCBs shall be conducted using the methods in 41.5(1) “b”(1) and as follows:

1. Each system which monitors for PCBs shall analyze each sample using Method 505, 508, 508.1, or 525.2. Users of Method 505 may have more difficulty in achieving the required Aroclor detection limits than users of Method 508, 508.1, or 525.2.

2. If PCBs (as one of seven Aroclors) are detected in any sample analyzed using Method 505 or 508, the system shall reanalyze the sample using Method 508A to quantitate PCBs as decachlorobiphenyl.

PCB AROCLOR DETECTION LIMITS

| <u>Aroclor</u> | <u>Detection Limit (mg/L)</u> |
|----------------|-------------------------------|
| 1016 | 0.00008 |
| 1221 | 0.02 |
| 1232 | 0.0005 |
| 1242 | 0.0003 |
| 1248 | 0.0001 |
| 1254 | 0.0001 |
| 1260 | 0.0002 |

3. Compliance with the PCB MCL shall be determined based upon the quantitative results of analyses using Method 508A.

d. Best available technology(ies) (BATs). Rescinded IAB 8/11/99, effective 9/15/99.

e. Total trihalomethanes sampling, analytical and other requirements. Rescinded IAB 1/7/04, effective 2/11/04.

f. Analytical procedures—organics. Rescinded IAB 1/7/04, effective 2/11/04.

41.5(2) Organic chemicals occurring as (nontrihalomethane) disinfection by-products. Reserved.
[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.6(455B) Disinfection byproducts maximum contaminant levels and monitoring requirements.

41.6(1) Stage 1 disinfection byproducts requirements.

a. Applicability.

(1) This rule establishes criteria under which CWS and NTNC public water supply systems that add a chemical disinfectant to the water in any part of the drinking water treatment process or which provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in this rule and the maximum residual disinfectant levels (MRDL) and treatment technique requirements for disinfection byproduct precursors listed in 567—43.6(455B).

(2) Rescinded IAB 1/7/04, effective 2/11/04.

(3) Compliance dates for this rule are based upon the source water type and the population served. Systems are required to comply with this rule as follows, unless otherwise noted. The department may assign an earlier monitoring period as part of the operation permit, but compliance with the maximum contaminant level is not required until the dates stated below.

1. CWS and NTNC systems which use surface water or groundwater under the direct influence of surface water in whole or in part and which serve 10,000 or more persons must comply with this rule beginning January 1, 2002.

2. All other CWS and NTNC systems covered by 41.6(1)“a”(1) must comply with this rule by January 1, 2004.

(4) Consecutive systems. Consecutive systems that provide water containing a disinfectant or oxidant are required to comply with this rule.

(5) Systems with multiple water sources. Systems with water sources that are used independently from each other, are not from the same source as determined by the department, or do not go through identical treatment processes are required to conduct the monitoring for the applicable disinfectants or oxidants and disinfection byproducts during operation of each source. The system must comply with this rule during the use of each water source.

b. Maximum contaminant levels for disinfection byproducts.

(1) The maximum contaminant levels (MCLs) for disinfection byproducts are as follows:

| Disinfection byproduct | MCL (mg/L) |
|-------------------------------|------------|
| Bromate | 0.010 |
| Chlorite | 1.0 |
| Haloacetic acids (HAA5) | 0.060 |
| Total trihalomethanes (TTHM)* | 0.080 |

*The TTHM MCL changed from 0.10 mg/L to 0.080 mg/L effective January 1, 2002, for CWS serving at least 10,000 people and effective January 1, 2004, for all other CWS and NTNC systems which are subject to this rule.

(2) Beginning on the date listed in the following table, a system must comply with the total trihalomethanes MCL and the haloacetic acid MCL as a locational running annual average at each monitoring location.

| System Size (number of people served) | Date system must comply with MCL at each sampling location* |
|---|--|
| Systems that are not part of a combined distribution system and systems that serve the largest population in the combined distribution system | |
| System serving at least 100,000 people | April 1, 2012 |
| System serving 50,000-99,999 people | October 1, 2012 |
| System serving 10,000-49,999 people | October 1, 2013 |
| System serving fewer than 10,000 people | <ul style="list-style-type: none"> • October 1, 2013, for all groundwater systems and for SW/IGW systems that did not collect <i>Cryptosporidium</i> source water samples • October 1, 2014, for SW/IGW systems that collected <i>Cryptosporidium</i> source water samples |
| Other systems that are part of a combined distribution system | |
| Consecutive or wholesale system | At the same time as the system with the earliest compliance date in the combined distribution system |

*The department may grant up to an additional 24 months for compliance with the MCLs and operational evaluation levels if the system requires capital improvements to comply with an MCL.

c. Monitoring requirements for disinfection byproducts.

(1) General requirements.

1. Systems must take all samples during normal operating conditions.
2. Systems may consider multiple wells drawing water from a single aquifer as one treatment plant for determining the minimum number of TTHM and HAA5 samples required, with department approval.
3. Failure to monitor in accordance with the monitoring plan required under 41.6(1) "c"(1)"6" is a monitoring violation.
4. Failure to monitor is a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages, and the system's failure to monitor makes it impossible to determine compliance with MCLs.
5. Systems may use only data collected under the provisions of this rule or 567—43.6(455B) to qualify for reduced monitoring.
6. Each system required to monitor under the provisions of this rule or 567—43.6(455B) must develop and implement a monitoring plan. The system must maintain the plan and make it available for inspection by the department and the general public no later than 30 days following the applicable compliance dates in 41.6(1) "a"(3). All systems using surface water or groundwater under the direct influence of surface water and serving more than 3,300 people must submit a copy of the monitoring plan to the department by the applicable date in 41.6(1) "a"(3)"1." The department may also require the plan to be submitted by any other system. After review, the department may require changes in any plan elements. The plan must include at least the following elements:
 - Specific locations and schedules for collecting samples for any parameters included in this rule.
 - How the system will calculate compliance with MCLs, MRDLs, and treatment techniques.

7. The department may require a monthly monitoring frequency for disinfection byproducts, which would be specified in the operation permit.

(2) Bromate. Community and nontransient noncommunity systems using ozone for disinfection or oxidation must conduct monitoring for bromate.

1. Routine monitoring. Systems must take at least one sample per month for each treatment plant in the system using ozone, collected at each source/entry point to the distribution system while the ozonation system is operating under normal conditions.

2. Reduced monitoring. A system may reduce monitoring from monthly to quarterly, if the system's running annual average bromate concentration is less than or equal to 0.0025 mg/L based on monthly bromate measurements for the most recent four quarters. If the system previously qualified for reduced bromate monitoring and is on quarterly sampling frequency, it may remain on reduced monitoring as long as the running annual average of the bromate samples is less than or equal to 0.0025 mg/L. If the running annual average of quarterly bromate samples exceeds 0.0025 mg/L, the system must resume routine bromate monitoring. Only three analytical methods may be used for bromate samples under reduced monitoring: EPA Method 317.0 Revision 2.0, Method 326.0, or Method 321.8.

(3) Chlorite. Community and nontransient noncommunity water systems using chlorine dioxide, for disinfection or oxidation, must conduct monitoring for chlorite. If the system does not use chlorine dioxide on a daily basis, the system must conduct the required daily monitoring each day chlorine dioxide is used, and any required monthly monitoring during those months in which chlorine dioxide is used during any portion of the month.

1. Routine daily monitoring. Systems must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the chlorite MCL, the system must take additional samples in the distribution system the following day at the locations required by 41.6(1) "c"(3)"3," which are in addition to the sample required at the entrance to the distribution system. These daily entry point to the distribution system samples may be analyzed by system personnel, in accordance with 41.6(1) "d."

2. Routine monthly monitoring. Systems must take a three-sample set each month in the distribution system. The system must take one sample at each of the following locations: near the first customer, at a location representative of average residence time, and at a location reflecting maximum residence time in the distribution system. Any additional routine sampling must be conducted in the same manner (as three-sample sets, at the specified locations). The system may use the results of additional monitoring conducted in accordance with 41.6(1) "c"(3)"3" to meet the requirement for monitoring in 41.6(1) "c"(3)"2." These monthly distribution system samples must be analyzed by a certified laboratory using an approved ion chromatography method, in accordance with 41.6(1) "d."

3. Additional monitoring. On each day following a routine sample monitoring result that exceeds the chlorite MCL at the entrance to the distribution system, the system is required to take three chlorite distribution system samples at the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system). These additional distribution system samples must be analyzed by a certified laboratory using an approved ion chromatography method, in accordance with 41.6(1) "d."

4. Reduced monitoring.

- Daily chlorite monitoring at the entrance to the distribution system required by 41.6(1) "c"(3)"1" may not be reduced.

- The department may allow systems with monthly chlorite monitoring in the distribution system required by 41.6(1) "c"(3)"2" to be reduced to a requirement of 1 three-sample set per quarter after one year of monitoring where no individual chlorite sample taken in the distribution system under 41.6(1) "c"(3)"2" has exceeded the chlorite MCL and the system has not been required to conduct additional monitoring under 41.6(1) "c"(3)"3." The system may remain on the reduced monitoring schedule until either any of the three individual chlorite samples taken quarterly in the distribution system under 41.6(1) "c"(3)"2" exceeds the chlorite MCL or the system is required to conduct monitoring under 41.6(1) "c"(3)"3" of this rule, at which time the system must revert to routine monitoring.

(4) Total trihalomethanes (TTHM) and haloacetic acids (HAA5).

1. Routine monitoring. Systems must monitor at the frequency indicated in the following table. Both the TTHM and HAA5 samples must be collected as paired samples during the same time period in order for each parameter to have the same annual average period for result comparison. A paired sample is one that is collected at the same location and time and is analyzed for both TTHM and HAA5 parameters.

Routine Monitoring Frequency for TTHM and HAA5

| Type of System (source water type and population served) | Minimum Monitoring Frequency | Sample Location in the Distribution System |
|---|---|--|
| SW/IGW ³ system serving ≥10,000 persons | Four water samples per quarter per treatment plant | At least 25 percent of all samples collected each quarter at locations representing maximum residence time. Remaining samples taken at locations representative of at least average residence time in the distribution system and representing the entire distribution system, taking into account number of persons served, different sources of water, and different treatment methods. ¹ |
| SW/IGW ³ system serving 500-9,999 persons | One water sample per quarter per treatment plant | Locations representing maximum residence time. ¹ |
| SW/IGW ³ system serving <500 persons | One sample per year per treatment plant during month of warmest water temperature | Locations representing maximum residence time. ¹ If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in 41.6(1)“c”(4)“2,” second bulleted paragraph. |
| System using only non-IGW groundwater using chemical disinfectant and serving ≥10,000 persons | One water sample per quarter per treatment plant ² | Locations representing maximum residence time. ¹ |
| System using only non-IGW groundwater using chemical disinfectant and serving <10,000 persons | One sample per year per treatment plant during month of warmest water temperature | Locations representing maximum residence time. ¹ If the sample (or average of annual samples, if more than one sample is taken) exceeds MCL, system must increase monitoring to one sample per treatment plant per quarter, taken at a point reflecting the maximum residence time in the distribution system, until system meets reduced monitoring criteria in 41.6(1)“c”(4)“2,” second bulleted paragraph. |

¹If a system chooses to sample more frequently than the minimum required, at least 25 percent of all samples collected each quarter (including those taken in excess of the required frequency) must be taken at locations that represent the maximum residence time of the water in the distribution system. The remaining samples must be taken at locations representative of at least average residence time in the distribution system.

²Multiple wells drawing water from a single aquifer may be considered one treatment plant for determining the minimum number of samples required, with department approval.

³SW/IGW indicates those systems that use either surface water (SW) or groundwater under the direct influence of surface water (IGW), in whole or in part.

2. Reduced monitoring. The department may allow systems a reduced monitoring frequency, except as otherwise provided, in accordance with the following table. Source water total organic carbon (TOC) levels must be determined in accordance with 567—subparagraph 43.6(2)“c”(1).

Reduced Monitoring Frequency for TTHM and HAA5

| If you are a ... | And you have monitored at least one year and your ... | You may reduce monitoring to this level |
|---|--|--|
| SW/IGW ¹ system serving $\geq 10,000$ persons which has a source water annual average TOC level, before any treatment, of ≤ 4.0 mg/L. | TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L | One sample per treatment plant per quarter at distribution system location reflecting maximum residence time. |
| SW/IGW ¹ system serving 500 - 9,999 persons that has a source water annual average TOC level, before any treatment, of ≤ 4.0 mg/L. | TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L | One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. |
| SW/IGW ¹ system serving < 500 persons | Any SW/IGW ¹ system serving < 500 persons may not reduce its monitoring to less than one sample per treatment plant per year. | |
| System using only non-IGW groundwater using chemical disinfectant and serving $\geq 10,000$ persons | TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L | One sample per treatment plant per year at distribution system location reflecting maximum residence time during month of warmest water temperature. |
| System using only non-IGW groundwater using chemical disinfectant and serving $< 10,000$ persons | TTHM annual average ≤ 0.040 mg/L and HAA5 annual average ≤ 0.030 mg/L for two consecutive years; or, TTHM annual average ≤ 0.020 mg/L and HAA5 annual average ≤ 0.015 mg/L for one year. | One sample per treatment plant per three-year monitoring cycle at distribution system location reflecting maximum residence time during month of warmest water temperature, with the three-year cycle beginning on January 1 following quarter in which system qualifies for reduced monitoring. |

¹SW/IGW indicates those systems that use either surface water (SW) or groundwater under the direct influence of surface water (IGW), in whole or in part.

- Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more frequently than annually) is less than or equal to 0.060 mg/L for TTHMs and is less than or equal to 0.045 mg/L for HAA5. Systems that do not meet these levels must resume monitoring at the frequency identified in 41.6(1) "c"(4)"1" in the quarter immediately following the quarter in which the system exceeds 0.060 mg/L for TTHMs and 0.045 mg/L for HAA5. For systems using only groundwater not under the direct influence of surface water and serving fewer than 10,000 persons, if either the TTHM annual average is > 0.080 mg/L or the HAA5 annual average is > 0.060 mg/L, the system must go to increased monitoring identified in 41.6(1) "c"(4)"1" in the quarter immediately following the monitoring period in which the system exceeds 0.080 mg/L for TTHMs or 0.060 mg/L for HAA5.

- The department may allow systems on increased monitoring to return to routine monitoring if, after one year of monitoring, TTHM annual average is less than or equal to 0.060 mg/L and HAA5 annual average is less than or equal to 0.045 mg/L.

- The department may return a system to routine monitoring at the department's discretion.

d. *Analytical requirements for disinfection byproducts.*

(1) Systems must use only the analytical method(s) specified in this paragraph, or equivalent methods as determined by EPA, to demonstrate compliance with the requirements of this rule.

(2) Systems must measure disinfection byproducts by the methods (as modified by the footnotes) listed in the following table:

Approved Methods for Disinfection Byproduct Compliance Monitoring

| Contaminant and Methodology | EPA Method ¹ | Standard Method ² | ASTM Method ³ |
|--|--|---|---------------------------------|
| TTHM | | | |
| P&T/GC/EICD & PID | 502.2 ⁴ | | |
| P&T/GC/MS | 524.2, 524.3, 524.4 | | |
| LLE/GC/ECD | 551.1 | | |
| HAA5 | | | |
| LLE (diazomethane)/GC/ECD | | 6251 B ⁵ , 6251 B-07 ¹² | |
| SPE (acidic methanol)/GC/ECD | 552.1 ⁵ | | |
| LLE (acidic methanol)/GC/ECD | 552.2, 552.3 | | |
| Ion chromatography electrospray ionization tandem mass spectrometry (IC-ESI-MS/MS) | 557 ¹⁰ | | |
| Bromate | | | |
| Ion chromatography | 300.1 | | D 6581-00 |
| Ion chromatography & postcolumn reaction ⁹ | 317.0 Rev. 2.0 ⁶ , 326.0 ⁶ | | |
| IC/ICP-MS ⁹ | 321.8 ^{6, 7} | | |
| Two-dimensional ion chromatography (IC) | 302.0 ¹¹ | | |
| Ion chromatography electrospray ionization tandem mass spectrometry (IC-ESI-MS/MS) | 557 ¹⁰ | | |
| Chemically suppressed ion chromatography | | | D 6581-08 A |
| Electrolytically suppressed ion chromatography | | | D 6581-08 B |
| Chlorite ⁸ | | | |
| Amperometric titration | | 4500-ClO ₂ E ⁸ | |
| Amperometric sensor | | | ChlordioX Plus ^{8, 13} |
| Spectrophotometry | 327.0 Rev. 1.1 ⁸ | | |
| Ion chromatography | 300.0, 300.1, 317.0 Rev. 2, 326.0 | | |
| Chemically suppressed ion chromatography | | | D 6581-08 A |
| Electrolytically suppressed ion chromatography | | | D 6581-08 B |

ECD = electron capture detector

IC = ion chromatography

P&T = purge and trap

EICD = electrolytic conductivity detector

LLE = liquid/liquid extraction

PID = photoionization detector

GC = gas chromatography

MS = mass spectrometer

SPE = solid phase extractor

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register on February 16, 1999, in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408.

¹EPA: The following methods are available from the National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847):

Methods 300.0 and 321.8: Methods for the Determination of Organic and Inorganic Compounds in Drinking Water, Volume 1, USEPA, August 2000, EPA 815-R-00-014 (available through NTIS, PB2000-106981).

Method 300.1: "Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0," EPA-600/R-98/118, 1997 (available through NTIS, PB98-169196).

Method 317.0: “Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis, Revision 2.0,” USEPA, July 2001, EPA 815-B-01-001.

Method 326.0: “Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis, Revision 1.0,” USEPA, June 2002, EPA 815-R-03-007.

Method 327.0: “Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry, Revision 1.1,” USEPA, May 2005, EPA 815-R-05-008.

Methods 502.2, 524.2, 551.1, and 552.2: Methods for the Determination of Organic Compounds in Drinking Water—Supplement III, EPA-600/R-95-131, August 1995 (NTIS PB95-261616).

Method 524.3: “Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry, Version 1.0,” June 2009. EPA 815-B-09-009. Available at www.nemi.gov.

Method 524.4: “Measurement of Purgeable Organic Compounds in Water by Gas Chromatography/Mass Spectrometry Using Nitrogen Purge Gas, Version 1.0,” May 2013. EPA 815-R-13-002. Available at www.nepis.epa.gov.

Method 552.1: Methods for the Determination of Organic Compounds in Drinking Water—Supplement II, EPA-600/R-92-129, August 1992 (NTIS PB92-207703).

Method 552.3: “Determination of Haloacetic Acids and Dalapon in Drinking Water by Liquid-liquid Microextraction, Derivatization, and Gas Chromatography with Electron Capture Detection, Revision 1.0,” USEPA, July 2003, EPA-815-B-03-002.

24500-CIO2 E and 6251B: Standard Methods for the Examination of Water and Wastewater, 19th (1995), 20th (1998), 21st (2005), and 22nd (2012) editions, American Public Health Association, which are available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

³Method D 6581-00: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428: Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 2001 (or any year containing the cited version).

⁴If TTHMs are the only analytes being measured in the sample, then a PID is not required.

⁵The samples must be extracted within 14 days of sample collection.

⁶Ion chromatography and postcolumn reaction or IC/ICP-MS must be used for bromate analysis for purposes of demonstrating eligibility of reduced monitoring.

⁷Samples must be preserved at sample collection with 50 mg ethylenediamine (EDA)/L of sample and must be analyzed within 28 days.

⁸Amperometric titration or spectrophotometry may be used for routine daily monitoring of chlorite at the entrance to the distribution system, as prescribed in 41.6(1) “c”(3)“1.” Ion chromatography must be used for routine monthly monitoring of chlorite and additional monitoring of chlorite in the distribution system, as prescribed in 41.6(1) “c”(3)“2” and “3.”

⁹These are the only methods approved for reduced bromate monitoring under 41.6(1) “c”(2)“2.”

¹⁰EPA Method 557, “Determination of Haloacetic Acids, Bromate, and Dalapon in Drinking Water by Ion Chromatography Electrospray Ionization Tandem Mass Spectrometry (IC-ESI-MS/MS),” August 2009. EPA 815-B-09-012. Available at www.nemi.gov.

¹¹EPA Method 302.0, “Determination of Bromate in Drinking Water Using Two-Dimensional Ion Chromatography with Suppressed Conductivity Detection,” September 2009. EPA 815-B-014. Available at www.nemi.gov.

¹²Standard Methods Online is available at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

¹³ChlordioX Plus. “Chlorine Dioxide and Chlorite in Drinking Water by Amperometry Using Disposable Sensors,” November 2013. Available from Palintest Ltd., Jamike Avenue (Suite 100), Erlanger, KY 41018.

(3) Certified laboratory requirements. Analyses under this rule for disinfection byproducts shall only be conducted by laboratories that have been certified by the department and are in compliance with the requirements of 567—Chapter 83, except as specified under 41.6(1) “d”(4). The performance evaluation sample acceptance limits and minimum reporting levels are listed in 567—subparagraph 83.6(7) “a”(6).

(4) Daily chlorite samples at the entrance to the distribution system must be measured by a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83.

e. Compliance requirements for disinfection byproducts.

(1) General requirements.

1. When compliance is based on a running annual average of monthly or quarterly samples or averages and the system fails to monitor for TTHM, HAA5, or bromate, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. Unless invalidated by the department, all samples taken and analyzed under the provisions of this rule must be included in determining compliance, even if that number is greater than the minimum required.

3. If, during the first year of monitoring under paragraph 41.6(1) "c," any individual quarter's average will cause the running annual average of that system to exceed the MCL, the system is out of compliance at the end of that quarter.

(2) Bromate. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly samples (or, for months in which the system takes more than one sample, the average of all samples taken during the month) collected by the system as prescribed by 41.6(1) "c"(2). If the average of samples covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 567—42.1(455B), in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d." If a PWS fails to complete 12 consecutive months' monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

(3) Chlorite. Compliance must be based on an arithmetic average of each three-sample set taken in the distribution system as prescribed by 41.6(1) "c"(3)"1" and 41.6(1) "c"(3)"2." If the arithmetic average of any three-sample set exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 567—42.1(455B), in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d."

(4) TTHM and HAA5.

1. For systems monitoring quarterly, compliance with MCLs in 41.6(1) "b" must be based on a running annual arithmetic average, computed quarterly, of quarterly arithmetic averages of all samples collected by the system as prescribed by 41.6(1) "c"(4).

2. For systems monitoring less frequently than quarterly, systems demonstrate MCL compliance if the average of samples taken that year under the provisions of 41.6(1) "c"(4) does not exceed the MCLs in 41.6(1) "b." If the average of these samples exceeds the MCL, the system must increase monitoring to once per quarter per treatment plant and is not in violation of the MCL until it has completed one year of quarterly monitoring, unless the result of fewer than four quarters of monitoring will cause the running annual average to exceed the MCL, in which case the system is in violation at the end of that quarter. Systems required to increase to quarterly monitoring must calculate compliance by including the sample that triggered the increased monitoring plus the following three quarters of monitoring.

3. If the running annual arithmetic average of quarterly averages covering any consecutive four-quarter period exceeds the MCL, the system is in violation of the MCL and must notify the public pursuant to 567—42.1(455B) in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d."

4. If a PWS fails to complete four consecutive quarters of monitoring, compliance with the MCL for the last four-quarter compliance period must be based on an average of the available data.

f. Reporting requirements for disinfection byproducts. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected. The specific reporting requirements for disinfection byproducts are listed in 567—subparagraph 42.4(3) "d"(2).

41.6(2) Stage 2 initial distribution system evaluation. The department is adopting by reference the requirements for the Stage 2 initial distribution system evaluation (IDSE) listed in 40 CFR 141.600-605 as adopted on January 4, 2006. This regulation establishes monitoring and other requirements for identifying compliance monitoring locations that will be used to determine compliance with maximum contaminant levels for total trihalomethanes and haloacetic acids. All CWS required to comply with 41.6(1) and all NTNC serving at least 10,000 people that are required to comply with 41.6(1) are

required to comply with this subrule. The requirements in this subrule constitute national primary drinking water regulations. Only the analytical methods specified in 41.6(1)“d” may be used to demonstrate compliance with this subrule.

41.6(3) Stage 2 disinfection byproducts requirements. The requirements of this subrule constitute national primary drinking water regulations. This subrule establishes monitoring and other requirements for achieving compliance with MCLs based on locational running annual averages (LRAA) for TTHM and HAA5.

a. Applicability. All CWS and NTNC systems that use a primary or residual disinfectant other than ultraviolet light or deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light must comply with the requirements in this subrule.

(1) *Schedule.* Systems must comply with the dates listed in the appropriate schedule. For the purposes of this subrule, the combined distribution system (CDS) as defined in 567—40.2(455B) only includes active connections; emergency connections are excluded. Any CWS or NTNC that purchases or sells water on a routine basis through an active connection to another CWS or NTNC is part of a combined distribution system. All systems included in a CDS must adhere to the schedule of the system that serves the largest population in that CDS. The system must comply with the requirements on the schedule for systems that are not a part of a CDS and for systems that serve the largest population in the CDS. The schedule for the other systems that are a part of a CDS, either wholesale or consecutive, is the same schedule as that of the system with the earliest compliance date in the CDS.

| Schedule | System Population | Date by which system must begin Stage 2 compliance monitoring |
|----------|-------------------|---|
| 1 | At least 100,000 | April 1, 2012 |
| 2 | 50,000-99,999 | October 1, 2012 |
| 3 | 10,000-49,999 | October 1, 2013 |
| 4 | Fewer than 10,000 | <ul style="list-style-type: none"> • October 1, 2013, for all GW systems and any SW/IGW systems that did not conduct <i>Cryptosporidium</i> sampling under 567—paragraph 43.11(3)“b”(2)“4” • October 1, 2014, for SW/IGW systems that conducted <i>Cryptosporidium</i> sampling under 567—paragraph 43.11(3)“b”(2)“4” |

(2) *Initiation of compliance monitoring under Stage 2.* Systems shall switch from Stage 1 compliance monitoring (41.6(1)) to Stage 2 monitoring as follows:

1. Systems required to conduct quarterly monitoring must start monitoring in the first full calendar quarter that includes the compliance date in the preceding table.

2. Systems that conducted IDSE monitoring and have an approved report and that are required to conduct monitoring at a frequency less than quarterly must start monitoring in the calendar month recommended in the approved IDSE report.

3. Systems that were not required to prepare an IDSE report under 41.6(2) must update their Stage 1 monitoring plan to meet the Stage 2 requirements and submit it to the department for approval six months prior to the compliance date in the preceding table.

(3) *Timing of initial determination of compliance under Stage 2.*

1. Systems required to conduct quarterly monitoring must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the results of subsequent sampling. Compliance determination must continue at the end of each subsequent quarter.

2. Systems required to conduct monitoring at a frequency that is less than quarterly must make compliance calculations beginning with the first compliance sample taken after the compliance date.

(4) *Monitoring and compliance.*

1. Systems required to monitor quarterly must calculate LRAAs for TTHM and HAA5 using the monitoring results collected under this subrule and determine that each LRAA does not exceed the MCL.

If the system does not complete the four consecutive quarters of monitoring, the system must calculate the compliance with the MCL based on the average of the available data from the most recent four quarters. If the system collects more than one sample per quarter at a monitoring location, all samples taken in the quarter at that location must be averaged to determine a quarterly average to be used for the LRAA calculation. If a system fails to monitor, it is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA.

2. Systems required to monitor yearly or triennially must determine that each sample collected is less than the MCL. If any sample exceeds the MCL, the system must comply with the requirements of 41.6(3) "e." If no sample exceeds the MCL, the sample result for each monitoring location is considered to be the LRAA for that monitoring location. If a system fails to monitor, it is in violation of the monitoring requirements for each quarter that a monitoring result would be used in calculating an LRAA.

3. The department may grant up to an additional 24 months for compliance with MCLs and operational evaluation levels if the system is required to make capital improvements in order to comply with an MCL.

(5) Any CWS or NTNC system that begins using water to which a disinfectant has been added, other than ultraviolet light, after the initial compliance dates for IDSE or Stage 2 compliance monitoring must comply with this subrule.

b. Monitoring plan. All systems must develop and implement a disinfection byproduct monitoring plan, which shall be kept on file at the system for review by the department and the public. The monitoring plan must contain the monitoring locations, monitoring dates, and compliance calculation procedures.

(1) If the system has an approved IDSE-standard monitoring plan (IDSE-SMP) report, that report contains all of the plan elements and meets this requirement.

(2) If the system does not have an approved IDSE-SMP report and does not have sufficient monitoring locations from its initial disinfection byproduct sampling plan, the system must identify additional locations by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified. The system must provide the rationale for identifying locations as having high levels of TTHM or HAA5.

(3) If the system does not have an approved IDSE-SMP report and has more monitoring locations from its initial Stage 1 disinfection byproduct sampling plan than the number of locations required under the Stage 2 compliance monitoring, the system must identify which locations it will use for compliance monitoring by alternating selection of locations representing high TTHM levels and high HAA5 levels until the required number of compliance monitoring locations have been identified.

(4) All plans must be reviewed by the system every three years and updated as system conditions change (such as changes in water quality or hydraulics, etc.).

1. A system may revise its monitoring plan to reflect changes in treatment, distribution system operations, and layout (including new service areas), to reflect other factors that may affect TTHM or HAA5 formation, or for department-approved reasons.

2. The system must consult with the department regarding the need for changes and the appropriateness of changes. The system must replace existing compliance monitoring locations that have the lowest LRAA with new locations that reflect the current distribution system locations with expected high TTHM or HAA5 levels.

3. The department may require modifications in the system's monitoring plan.

(5) Systems are also required to maintain the disinfectant and MRDL elements of the Stage 1 monitoring plan pursuant to 41.6(1) "c"(1)"6" and 567—paragraph 43.6(1) "c"(1)"5."

(6) All systems are required to have a valid disinfection byproducts monitoring plan prior to the start of compliance monitoring in 41.6(3) "a"(1).

c. Routine monitoring. Systems are required to start monitoring at the locations specified in the approved disinfection byproducts monitoring plan and on the schedule specified in 41.6(3) "a"(1). Each system must monitor the disinfection byproducts at the minimum number of locations identified in the Routine Monitoring table.

Routine Monitoring

| Source water type | Population size category | Monitoring frequency | Total number of distribution system monitoring location sites per monitoring period |
|-------------------|--------------------------|----------------------|---|
| SW/IGW | <500 | per year | 2 |
| | 500-3,300 | per quarter | 2 |
| | 3,301-9,999 | per quarter | 2 |
| | 10,000-49,999 | per quarter | 4 |
| | 50,000-249,999 | per quarter | 8 |
| | 250,000-999,999 | per quarter | 12 |
| Groundwater | <500 | per year | 2 |
| | 500-9,999 | per year | 2 |
| | 10,000-99,999 | per quarter | 4 |
| | 100,000-499,999 | per quarter | 6 |

(1) All systems must monitor during the month of highest disinfection byproduct concentrations.

(2) Systems on a quarterly monitoring frequency must collect samples for TTHM and HAA5 every 90 days at each monitoring location, except that SW/IGW systems serving 500 to 3,300 people may collect at one location as provided in 41.6(3)“c”(3). Each sample collected at each location must be analyzed for both TTHM and HAA5 components.

(3) Systems on an annual monitoring frequency and SW/IGW systems serving 500 to 3,300 people are required to collect TTHM and HAA5 samples at the locations with the highest TTHM and HAA5 concentrations, respectively. Each sample must be analyzed for both TTHM and HAA5 components. Sample collection is required from only one location if the highest TTHM concentration and the highest HAA5 concentration occur at the same location.

(4) Analytical methods. Systems must use an approved method listed in 41.6(1)“d”(2) for TTHM and HAA5 analyses pursuant to this subrule. Analyses must be conducted by laboratories certified for disinfection byproducts analyses in accordance with 567—Chapter 83.

d. Reduced monitoring. A system may reduce monitoring to the level specified in the Reduced Monitoring table anytime the locational running annual average is less than or equal to half the MCL for TTHM and HAA5 at all monitoring locations (i.e., less than or equal to 0.040 mg/L for TTHM and 0.030 mg/L for HAA5). Only data collected under the provisions of this rule may be used to qualify for reduced monitoring.

Reduced Monitoring

| Source water type | Population size category | Monitoring frequency ¹ | Distribution system monitoring location sites per monitoring period ² |
|-------------------|--------------------------|-----------------------------------|---|
| SW/IGW | <500 | per year | Monitoring may not be reduced |
| | 500-3,300 | per year | 1 sample per year at the same location if the highest TTHM and HAA5 measurements occurred at the same location and in the same quarter, analyzed for both TTHM and HAA5 |
| | 3,301-9,999 | per year | 2 samples: one at the location and during the quarter with the highest TTHM single measurement; one at the location and during the quarter with the highest HAA5 single measurement |
| | 10,000-49,999 | per quarter | 2 samples: one at the highest TTHM LRAA location and one at the highest HAA5 LRAA location |
| | 50,000-249,999 | per quarter | 4 samples: one sample each at the highest two TTHM LRAA locations and one sample each at the highest two HAA5 LRAA locations |

| Source water type | Population size category | Monitoring frequency ¹ | Distribution system monitoring location sites per monitoring period ² |
|-------------------|--------------------------|-----------------------------------|---|
| | 250,000-999,999 | per quarter | 6 samples: one sample each at the highest three TTHM LRAA locations and one sample each at the highest three HAA5 LRAA locations |
| Groundwater | <500 | every third year | 1 sample at the same location if the highest TTHM and HAA5 measurements occurred at the same location and in the same quarter, analyzed for both TTHM and HAA5 |
| | 500-9,999 | per year | 1 sample per year at the same location if the highest TTHM and HAA5 measurements occurred at the same location and in the same quarter, analyzed for both TTHM and HAA5 |
| | 10,000-99,999 | per year | 2 samples: one at the location and during the quarter with the highest TTHM single measurement; one at the location and during the quarter with the highest HAA5 single measurement |
| | 100,000-499,999 | per quarter | 2 samples: one at the highest TTHM LRAA location and one at the highest HAA5 LRAA location |

¹Systems on a quarterly monitoring frequency must collect the sample(s) every 90 days.

²Each sample must be analyzed for all TTHM and HAA5 components.

(1) Additional source water TOC requirement for SW/IGW systems. For SW/IGW systems, the source water running annual average TOC level, before any treatment, must be less than or equal to 4.0 mg/L at each treatment plant treating surface water or influenced groundwater, based on the monitoring conducted under 567—paragraph 43.6(2) “b,” in order to qualify for reduced monitoring.

(2) Continued reduced monitoring frequency. Systems may remain on a reduced monitoring frequency as long as they meet the following criteria. For SW/IGW systems, the source water annual average TOC level requirement in 41.6(3) “d”(1) must continue to be met.

1. A system with a quarterly reduced monitoring frequency may remain on reduced monitoring as long as the TTHM LRAA is less than or equal to 0.040 mg/L and the HAA5 LRAA is less than or equal to 0.030 mg/L at each monitoring location.

2. A system with an annual or triennial monitoring frequency may remain on reduced monitoring as long as each TTHM sample is less than or equal to 0.060 mg/L and each HAA5 sample is less than or equal to 0.045 mg/L.

(3) Return to routine monitoring frequency. Systems that cannot meet the requirements for reduced monitoring must resume routine monitoring according to 41.6(3) “c” or begin increased monitoring according to 41.6(3) “e.”

1. A system with a quarterly reduced monitoring frequency must resume routine monitoring if the LRAA from any location exceeds either 0.040 mg/L for TTHM or 0.030 mg/L for HAA5.

2. A system with an annual or triennial monitoring frequency must resume routine monitoring if the annual sample at any location exceeds either 0.060 mg/L for TTHM or 0.045 mg/L for HAA5.

3. Any SW/IGW system must resume routine monitoring if the running annual average source water TOC level, prior to any treatment, is more than 4.0 mg/L.

4. In addition, the department may require any system to resume routine monitoring at the department’s discretion.

(4) Remaining on reduced monitoring from Stage 1 to Stage 2 transition. A system may remain on reduced monitoring after the dates listed in 41.6(3) “a”(1) if all of the following three criteria are met. If the three criteria are not met, the system must return to routine monitoring.

1. Under the IDSE, the system qualified for a 40/30 certification or received a very small system waiver;

2. The system meets the reduced monitoring criteria of this paragraph; and
3. The system has not changed or added locations for disinfection byproduct monitoring from those used under the Stage 1 requirements in 41.6(1).

e. Increased monitoring.

(1) Systems that are monitoring annually or triennially must increase their monitoring frequency to quarterly if the following conditions are met.

1. Single result exceeds the TTHM or HAA5 MCL. A system that is monitoring annually or triennially must increase monitoring to quarterly at all locations if a single TTHM sample is greater than 0.080 mg/L or a single HAA5 sample is greater than 0.060 mg/L. The quarterly samples must be analyzed for both TTHM and HAA5 components.

2. Systems with a TTHM or HAA5 MCL violation. A system that is monitoring annually or triennially that is in violation of the MCL for TTHM or HAA5, based upon the LRAA, must increase monitoring to quarterly at all locations. The quarterly samples must be analyzed for both TTHM and HAA5 components. The LRAA is calculated based on four consecutive quarters of monitoring or based on fewer quarters of data if the MCL would be exceeded regardless of the monitoring results of subsequent quarters.

(2) Systems on a quarterly monitoring frequency during Stage 1 to Stage 2 transition. A system that was on increased monitoring under Stage 1 must remain on increased monitoring until the system qualifies for a return to routine monitoring under 41.6(3) "e"(3). The system must conduct the increased monitoring at the monitoring locations in the monitoring plan developed under 41.6(3) "b," beginning on the date identified in 41.6(3) "a"(1).

(3) Return to routine monitoring frequency. A system may return to routine monitoring once the system has conducted increased monitoring for at least four consecutive quarters and the LRAA for every monitoring location is less than or equal to 0.060 mg/L for TTHM and less than or equal to 0.045 mg/L for HAA5. The system may not have any monitoring violations during the most recent four consecutive quarters.

f. Operational evaluation level (OEL).

(1) TTHM operational evaluation level. The TTHM operational evaluation level is determined by the sum of the two previous quarters' TTHM results plus twice the current quarter's TTHM result, divided by 4 to determine an average. If that average exceeds 0.080 mg/L, the system has exceeded the TTHM operational evaluation level.

(2) HAA5 operational evaluation level. The HAA5 operational evaluation level is determined by the sum of the two previous quarters' HAA5 results plus twice the current quarter's HAA5 result, divided by 4 to determine an average. If that average exceeds 0.060 mg/L, the system has exceeded the HAA5 operational evaluation level.

(3) A system must calculate the operational evaluation level at any monitoring location that has a single analytical result in excess of the TTHM or HAA5 MCL in the analytical data used to calculate the current 12-month LRAA. A system must determine compliance with the OEL every quarter.

(4) Requirements when the operational evaluation level is exceeded. The system must conduct an operational evaluation and submit a written report of the evaluation to the department within 90 days after the system is notified of the analytical result that caused the system to exceed the operational evaluation level. The written report must be made available to the public upon request. The report must include an examination of system treatment and distribution operational practices, including storage tank operations, excess storage capacity, distribution system flushing, changes in source water or source water quality, and treatment changes or problems that may contribute to disinfection byproduct formation, and what steps could be considered to minimize future exceedances.

1. The system may make a request to the department to limit the scope of the examination if the system is able to identify the cause of the operational evaluation level exceedance. The 90-day deadline for submitting the written report cannot be extended.

2. The system must have department approval to limit the scope of the examination. The approval must be in writing and kept with the completed report.

g. Reporting. All systems required to comply with this rule must meet the reporting requirements pursuant to 567—paragraph 42.4(3) “d.”

h. Record keeping. All systems required to comply with this rule must retain the monitoring plans and analytical results as required by 567—paragraph 42.5(1) “h.”
[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.7(455B) Groundwater rule: sanitary survey, microbial source water monitoring, treatment technique.

41.7(1) General requirements.

a. Scope. The requirements of this rule constitute national primary drinking water regulations.

b. Applicability. This rule applies to all public water systems that use groundwater except that it does not apply to public water systems that combine all of their groundwater with surface water or with influenced groundwater prior to treatment under 567—43.5(455B). For the purposes of this rule, “groundwater system” is defined as any public water system meeting this applicability statement, including consecutive systems receiving finished groundwater. For the purposes of this rule, “4-log treatment of viruses” means treatment that includes inactivation, removal, or a department-approved combination of inactivation and removal before or at the first customer of 4-log (99.99%) of viruses.

c. General requirements. Systems subject to this rule must comply with the following requirements:

(1) Sanitary survey information requirements for all groundwater systems as described in 41.7(2).
(2) Microbial source water monitoring requirements for groundwater systems that do not treat all of their groundwater to at least 99.99 percent (4-log) treatment of viruses, using inactivation, removal, or a department-approved combination of inactivation and removal before or at the first customer, as described in 41.7(3).

(3) Treatment technique requirements, as described in 41.7(4), that apply to groundwater systems that have fecally contaminated source waters, as determined by source water monitoring conducted under 41.7(3), or that have significant deficiencies that are identified by the department. A groundwater system with fecally contaminated source water or with significant deficiencies subject to the treatment technique requirements of this rule must implement one or more of the following corrective action options:

1. Correct all significant deficiencies;
2. Provide an alternate source of water;
3. Eliminate the source of contamination; or
4. Provide treatment that reliably achieves at least 4-log treatment of viruses (using inactivation, removal, or a department-approved combination of 4-log virus inactivation and removal) before or at the first customer.

(4) Groundwater systems that provide at least 4-log treatment of viruses are required to conduct compliance monitoring to demonstrate treatment effectiveness, as described in 41.7(4).

(5) If requested by the department, groundwater systems must provide the department with any existing information that will enable the department to perform a hydrogeologic sensitivity assessment. For the purposes of this rule, “hydrogeologic sensitivity assessment” is a determination of whether groundwater systems obtain water from hydrogeologically sensitive settings.

(6) Certified laboratory requirements. Analyses under this rule shall only be conducted by laboratories that have been certified by the department and are in compliance with the requirements of 567—Chapter 83.

41.7(2) Sanitary surveys for groundwater systems. For the purposes of this rule, a “sanitary survey,” as conducted by the department in accordance with 567—subrule 43.1(7), includes but is not limited to the following: an on-site review of the water sources (identifying sources of contamination using results of source water assessments or other relevant information where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water.

41.7(3) Groundwater source microbial monitoring and analytical methods. A groundwater system that has a department-approved 4-log treatment process for viruses and is fulfilling the requirements of 41.7(4) "b" is not required to conduct the triggered source water monitoring under 41.7(3) "a."

a. Triggered source water monitoring.

(1) General requirements. A groundwater system must conduct triggered source water monitoring if the conditions identified as follows exist:

1. The system does not provide at least 4-log treatment of viruses for each groundwater source; and

2. The system is notified that a sample collected under 41.2(1) "e" through 41.2(1) "i" is total coliform-positive, and the sample is not invalidated under 41.2(1) "d."

(2) Sampling requirements. A groundwater system must collect at least one groundwater source sample from each groundwater source in use at the time the total coliform-positive sample was collected under 41.2(1) "e" through 41.2(1) "i" that could have reasonably contributed to the positive sample. The source sample must be collected within 24 hours of when the system is notified of the total coliform-positive sample.

1. The department may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the groundwater source water sample within 24 hours due to circumstances beyond the system's control. In the case of an extension, the department must specify how much time the system has to collect the sample.

2. A groundwater system serving 1,000 or fewer people may use a repeat sample collected from a groundwater source to meet both the requirements of 41.2(1) "j" and to satisfy the monitoring requirements of 41.7(3) "a" if:

- The department approves the use of *E. coli* as the fecal indicator,
- The system only has one groundwater source required to be sampled,
- The system has no treatment, and
- Should the source water sample be *E. coli*-positive, the system would incur an acute coliform bacteria maximum contaminant level violation, must comply with Tier 1 public notification requirements, and must also comply with the additional sample monitoring in 41.7(3) "a"(3).

(3) Additional samples required. Unless the department requires corrective action for a valid triggered source water sample that tested positive for the fecal indicator, the system must collect five additional source water samples from that same source within 24 hours of being notified of the fecal indicator-positive sample result.

(4) Further requirements for consecutive and wholesale systems.

1. In addition to the other requirements in 41.7(3) "a," a consecutive groundwater system that has a total coliform-positive sample collected under 41.2(1) "f" through 41.2(1) "i" must notify the wholesale system(s) within 24 hours of being notified of the total coliform-positive sample.

2. In addition to the other requirements in 41.7(3) "a," a wholesale groundwater system that does not provide the 4-log treatment of viruses as described in 41.7(3) must comply with the following:

- A wholesale groundwater system that receives notice from a consecutive system it serves that a sample collected under 41.2(1) "f" through 41.2(1) "i" is total coliform-positive must, within 24 hours of being notified, collect triggered sample(s) from its groundwater source(s) under 41.7(3) "a"(2) and analyze the sample(s) for a fecal indicator.

- If the triggered source sample(s) is fecal indicator-positive, the wholesale groundwater system must notify all consecutive systems served by that groundwater source of the fecal indicator-positive result within 24 hours of being notified of the result and must collect the required additional five samples from the source within 24 hours under 41.7(3) "a"(3).

(5) Exceptions to the triggered source water monitoring requirements. A groundwater system is not required to comply with the source water monitoring requirements of 41.7(3) "a" if either of the following conditions exists:

1. The department determines and documents in writing that the total coliform-positive sample collected under 41.2(1) "e" through 41.2(1) "i" is caused by a distribution system deficiency; or

2. The total coliform-positive sample collected under 41.2(1) “e” through 41.2(1) “i” is collected at a location that meets department criteria for distribution system conditions that will cause total coliform-positive samples.

b. Assessment source water monitoring. If directed by the department, groundwater systems must conduct assessment source water monitoring that meets department-determined requirements for such monitoring. A groundwater system conducting assessment source water monitoring may use a triggered source water sample collected under 41.7(3) “a”(2) to meet the requirements of this paragraph. Department-determined assessment source water monitoring requirements may include:

(1) Collection of a total of 12 groundwater source samples that represent each month the system provides groundwater to the public;

(2) Collection of samples from each well unless the system obtains written department approval to conduct monitoring at one or more wells within the groundwater system that are representative of multiple wells used by that system and that draw water from the same hydrogeologic setting;

(3) Collection of a standard sample volume of at least 100 mL for fecal indicator analysis regardless of technical indicator or analytical method used;

(4) Analysis of all groundwater source samples using one of the analytical methods listed in 41.7(3) “c” for the presence of *E. coli*, enterococci, or coliphage;

(5) Collection of groundwater source samples at a location before any treatment of the groundwater source unless the department approves a sampling location after treatment; and

(6) Collection of groundwater source samples at the well itself unless the system’s configuration does not allow for sampling at the well itself and the department approves an alternate sampling location that is representative of the water quality of that well.

c. Analytical methods.

(1) A groundwater system subject to the source water monitoring requirements of this rule must collect a standard sample volume of at least 100 mL for fecal indicator analysis regardless of the fecal indicator or analytical method used.

(2) A groundwater system must analyze all groundwater source samples collected under 567—41.7(455B) using one of the analytical methods in the following table for the presence of *E. coli*, enterococci, or coliphage.

Analytical Methods for Source Water Monitoring

| Fecal Indicator ¹ | Methodology | Method Citation |
|------------------------------|-------------------------------------|--|
| <i>E. coli</i> | Colilert ³ | 9223B2, 12, 13 9223 B-97, B-04 ¹⁸ |
| | Colisure ³ | 9223B2, 12, 13 9223B-97, B-04 ¹⁸ |
| | Membrane filter method with MI agar | EPA Method 1604 ⁴ |
| | Colilert-18 | 9223B2, 12, 13 9223B-97, B-04 ¹⁸ |
| | m-ColiBlue24 Test ⁵ | |
| | E*Colite Test ⁶ | |
| | EC-MUG ⁷ | 9221F2, 13 9221 F-06 ¹⁸ |
| | NA-MUG ⁷ | 9222G ² |
| | Readycult | Readycult ¹⁴ |

| Fecal Indicator ¹ | Methodology | Method Citation |
|------------------------------|--|--|
| | Colitag | Modified Colitag ¹⁵ |
| | Chromocult | Chromocult ¹⁶ |
| | Tecta EC/TC | Tecta EC/TC ¹⁹ |
| Enterococci | Multiple-tube technique | 9230B ² 9230 B-04 ¹⁸ |
| | Membrane filter technique | 9230C ² |
| | Membrane filter technique | EPA Method 1600 ⁸ |
| | Enterolert ⁹ | |
| Coliphage | Two-step enrichment presence-absence procedure | EPA Method 1601 ¹⁰ , FastPhage ¹⁷ |
| | Single agar layer procedure | EPA Method 1602 ¹¹ |

Analyses must be conducted in accordance with the documents listed below. The Director of the Federal Register approves the incorporation by reference of the documents listed in footnotes 2 through 11 in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Copies may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, EPA West Room B102, Washington, DC 20460; (telephone: (202)566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202)741-6030, or go to: www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. The address for EPA's Water Resource Center, referenced in several of the footnotes, is EPA Water Resource Center (RC-4100T), 1200 Pennsylvania Avenue, NW, Washington, DC 20460.

¹The time from sample collection to initiation of analysis may not exceed 30 hours. The groundwater system is encouraged but is not required to hold samples below 10°C during transit.

²Methods are described in Standard Methods for the Examination of Water and Wastewater, 20th edition (1998), and copies may be obtained from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

³Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, ME 04092.

⁴EPA Method 1604: Total Coliforms and *Escherichia coli* in Water by Membrane Filtration Using a Simultaneous Detection Technique (MI Medium); September 2002, EPA 821-R-02-024. Method is available at www.nemi.gov.

⁵A description of the m-ColiBlue24 Test, "Total Coliforms and *E. coli* Membrane Filtration Method with m-ColiBlue24 Broth," Method No. 10029, Revision 2, August 17, 1999, is available from Hach Company, 100 Dayton Avenue, Ames, IA 50010.

⁶A description of the E*Colite Test, "Charm E*Colite Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Drinking Water," January 9, 1998, is available from Charm Sciences, Inc., 659 Andover Street, Lawrence, MA 01843-1032.

⁷EC-MUG (Method 9221F) or NA-MUG (Method 9222G) can be used for *E. coli* testing step as described in 41.2(1) "f"(6) or (7) after use of Standard Method 9221B, 9221D, 9222B, or 9222C.

⁸EPA Method 1600: Enterococci in Water by Membrane Filtration Using Membrane-Enterococcus Indoxyl-β-D-Glucoside Agar (MEI), EPA 821-R-02-022 (September 2002), is an approved variation of Standard Method 9230C. The method is available at www.nemi.gov. The holding time and temperature for groundwater samples is specified in footnote 1 above, rather than as specified in Section 8 of EPA Method 1600.

⁹Medium is available through IDEXX Laboratories, Inc., One IDEXX Drive, Westbrook, ME 04092. Preparation and use of the medium is set forth in the article "Evaluation of Enterolert for Enumeration of Enterococci in Recreational Waters" by Budnick, G.E., Howard, R.T., and Mayo, D.R., 1996, Applied and Environmental Microbiology, 62:3881-3884.

¹⁰EPA Method 1601: Male-Specific (F+) and Somatic Coliphage in Water by Two-Step Enrichment Procedure; April 2001, EPA 821-R-01-030. Method is available at www.nemi.gov.

¹¹EPA Method 1602: Male-Specific (F+) and Somatic Coliphage in Water by Single Agar Layer (SAL) Procedure; April 2001, EPA 821-R-01-029. Method is available at www.nemi.gov.

¹²Standard Methods for the Examination of Water and Wastewater, 21st edition (2005). Available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹³Standard Methods for the Examination of Water and Wastewater, 22nd edition (2012). Available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

¹⁴ReadyCult Method, "ReadyCult Coliforms 100 Presence/Absence Test for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters," January 2007, Version 1.1. Available from EMD Millipore, 290 Concord Road, Billerica, MA 01821.

¹⁵Modified Colitag Method, "Modified Colitag Test Method for the Simultaneous Detection of *E. coli* and Other Total Coliforms in Water (ATP D05-0035)," August 28, 2009. Available from www.nemi.gov or CPI International, 5580 Skylane Blvd., Santa Rosa, CA 95403.

¹⁶Chromocult Method, "Chromocult Coliform Agar Presence/Absence Membrane Filter Test Method for Detection and Identification of Coliform Bacteria and *Escherichia coli* in Finished Waters," November 2000, Version 1.0. Available from EMD Millipore, 290 Concord Road, Billerica, MA 01821.

¹⁷Charm Sciences, Inc., "FastPhage Test Procedure. Presence/Absence for Coliphage in Ground Water with Same Day Positive Prediction," Version 009, November 2012. Available at www.charmsciences.com.

¹⁸Standard Methods Online is available at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

¹⁹Tecta EC/TC. "Presence/Absence Method for Simultaneous Detection of Total Coliforms and *Escherichia coli* in Drinking Water," April 2014. Available from Veolia Water Solutions and Technologies, Suite 4697, Biosciences Complex, 116 Barrie Street, Kingston, Ontario, Canada K7L 3N6.

d. Invalidation of a fecal indicator-positive groundwater source sample.

(1) A groundwater system may obtain invalidation from the department of a fecal indicator-positive groundwater source sample collected under 41.7(3) "a" only under these conditions:

1. The system provides the department with written notice from the laboratory that improper sample analysis occurred; or

2. The department determines and documents in writing that there is substantial evidence that a fecal indicator-positive groundwater source sample is not related to source water quality.

(2) If the department invalidates a fecal indicator-positive groundwater source sample, the system must collect another source water sample under 41.7(3) "a" within 24 hours of being notified by the department of its invalidation decision. The sample must be analyzed for the same fecal indicator using the analytical methods in 41.7(3) "c." The department may extend the 24-hour time limit on a case-by-case basis if the system cannot collect the source water sample within 24 hours due to circumstances beyond the system's control. In the case of an extension, the department must specify how much time the system has to collect the sample.

e. Sampling location.

(1) Any groundwater source sample required under 41.7(3) "a" must be collected at a location prior to any treatment of the groundwater source unless the department approves a sampling location after treatment.

(2) If the system's configuration does not allow for sampling at the well itself, the system may collect a sample at a department-approved location to meet the requirements of 41.7(3) "a" if the sample is representative of the water quality of that well.

f. New sources. A groundwater system that places a new groundwater source into service must conduct assessment source water monitoring as directed by the department to include those items listed in 41.7(3) "b"(3) to (6). If directed by the department, the system must begin monitoring before the groundwater source is used to provide water to the public.

g. Public notification. A system with a groundwater source sample collected under 41.7(3) "a" or 41.7(3) "b" that is fecal indicator-positive and that is not invalidated under 41.7(3) "d," including consecutive systems served by the groundwater source, must conduct Tier 1 public notification under 567—subrule 42.1(2).

h. Monitoring violations. Failure to meet the requirements of 41.7(3) “a” through 41.7(3) “f” is a monitoring violation and requires the system to provide Tier 3 public notification under 567—subrule 42.1(4).

41.7(4) Treatment technique requirements for groundwater systems.

a. Groundwater systems with significant deficiencies or source water fecal contamination.

(1) The treatment technique requirements of this subrule, 41.7(4), must be met by groundwater systems when a significant deficiency is identified or when a groundwater source sample collected under 41.7(3) “a”(3) is fecal indicator-positive.

(2) If directed by the department, a groundwater system with a groundwater source sample collected under 41.7(3) “a”(2), 41.7(3) “a”(4), or 41.7(3) “b” that is fecal indicator-positive must comply with the treatment technique requirements of 41.7(4).

(3) When a significant deficiency is identified at a surface water or influenced groundwater system that also uses a groundwater source not under the influence of surface water, the system must comply with provisions of 41.7(4) “a” except in cases where the department determines that the significant deficiency is in a portion of the distribution system that is served solely by the surface water or influenced groundwater source.

(4) Unless the department directs the groundwater system to implement a specific corrective action, the groundwater system must consult with the department regarding the appropriate corrective action within 30 days of receiving written notice from the department of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under 41.7(3) “a”(3) was found to be fecal indicator-positive, or direction from the department that a fecal indicator-positive sample collected under 41.7(3) “a”(2), 41.7(3) “a”(4), or 41.7(3) “b” requires corrective action. For the purposes of 41.7(4), significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the department determines to be causing, or have potential for causing, the introduction of contamination into the water delivered to consumers.

(5) Within 120 days, or earlier if directed by the department, of receiving written notification from the department of a significant deficiency, written notice from a laboratory that a groundwater source sample collected under 41.7(3) “a”(3) was found to be fecal indicator-positive, or direction from the department that a fecal indicator-positive sample collected under 41.7(3) “a”(2), 41.7(3) “a”(4), or 41.7(3) “b” requires corrective action, the groundwater system must either:

1. Have completed corrective action in accordance with applicable department plan review processes or other department guidance or direction, if any, including department-specified interim measures; or

2. Be in compliance with a department-approved corrective action plan and schedule subject to the specified conditions as follows:

- Any subsequent modifications to a department-approved corrective action plan and schedule must also be approved by the department; and

- If the department specifies interim measures for protection of the public health pending department approval of the corrective action plan and schedule, or pending completion of the corrective action plan, the system must comply with these interim measures as well as with any schedule specified by the department.

(6) Corrective action alternatives. Groundwater systems that meet the conditions of 41.7(4) “a”(1) or (2) must implement one or more of the following corrective action alternatives:

1. Correct all significant deficiencies;

2. Provide an alternate source of water;

3. Eliminate the source of contamination; or

4. Provide treatment that reliably achieves at least 4-log treatment of viruses for the groundwater source.

(7) Special notice to the public of significant deficiencies or source water fecal contamination.

1. In addition to the applicable Tier 1 public notification requirements of 567—subrule 42.1(2), a community groundwater system that receives notice from the department of a significant

deficiency or notification of a fecal indicator-positive groundwater source sample that is not invalidated by the department under 41.7(3)“d” must inform the public served by the water system under 567—subparagraph 42.3(3)“h”(5) of the fecal indicator-positive source sample or of any significant deficiency that has not been corrected. The system must continue to inform the public annually until the significant deficiency is corrected or the fecal contamination in the groundwater source is determined by the department to be corrected under 41.7(3)“a”(5).

2. In addition to the applicable Tier 1 public notification requirements of 567—subrule 42.1(2), a noncommunity groundwater system that receives notice from the department of a significant deficiency must inform the public served by the water systems in a manner approved by the department of any significant deficiency that has not been corrected within 12 months of being notified by the department or earlier if directed by the department. The system must continue to inform the public annually until the significant deficiency is corrected. The information must include:

- The nature of the significant deficiency and the date the significant deficiency was identified by the department;
- The department-approved plan and schedule for correction of the significant deficiency, including interim measures, progress to date, and any interim measures completed; and
- For systems with a large proportion of non-English speaking consumers, as determined by the department, information in the applicable language(s) regarding the importance of the notice or a telephone number or address where consumers may contact the system to obtain a translated copy of the notice or assistance in the appropriate language.

3. If directed by the department, a noncommunity water system with significant deficiencies that have been corrected must inform its customers of the significant deficiencies, how the deficiencies were corrected, and the dates of correction under 41.7(4)“a”(7)“2.”

b. Compliance monitoring.

(1) Existing groundwater sources. A groundwater system that provides at least 4-log treatment of viruses must make a written application to the department in order to avoid the source water monitoring requirements of 41.7(3). Notification to the department must include engineering, operational, or other information that the department requests to evaluate the submission. The department must approve the 4-log request in writing before the system can avoid the groundwater source monitoring requirements. The system’s operation permit will include the mandatory operational requirements for the approved 4-log virus treatment. If the system subsequently discontinues 4-log treatment of viruses of a groundwater source or no longer wishes to be exempt from the groundwater source monitoring requirements, the system must conduct groundwater source monitoring as required under 41.7(3).

(2) New groundwater sources. A groundwater system that places a groundwater source in service that is not required to meet the source water monitoring requirements of 41.7(4) because the system provides at least 4-log treatment of viruses for the groundwater source must comply with the following requirements:

1. The system must notify the department in writing that it provides at least 4-log treatment of viruses for the groundwater source. Notification to the department must include engineering, operational, or other information that the department requests to evaluate the submission. The contact time values for inactivation of viruses using free chlorine, chlorine dioxide, and ozone are listed in 567—Chapter 43, Appendix C. No CT table is provided for chloramines and total chlorine because the CT values would be prohibitively high for groundwater systems.

2. The system must conduct compliance monitoring as required under 41.7(4)“b”(3) within 30 days of placing the source in service.

3. The system must conduct groundwater source monitoring under 41.7(3) if the system subsequently discontinues 4-log treatment of viruses for the groundwater source.

(3) Monitoring requirements. A groundwater system subject to the requirements of 41.7(4)“a” and 41.7(4)“b”(1) and (2) must monitor the effectiveness and reliability of treatment for that groundwater source before or at the first customer as follows:

1. Chemical disinfection.

- A groundwater system serving more than 3,300 people must continuously monitor the residual disinfectant concentration, using analytical methods specified in 567—subparagraph 43.5(4)“a”(5), at a location approved by the department and must record the lowest residual disinfectant concentration each day that water from the groundwater source is served to the public. The groundwater system must maintain the department-determined minimum residual disinfectant concentration every day the groundwater system serves water from the groundwater source to the public. If there is a failure in the continuous monitoring equipment, the groundwater system must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

- A groundwater system serving 3,300 or fewer people must monitor the residual disinfectant concentration using analytical methods specified in 567—subparagraph 43.5(4)“a”(5) at a location approved by the department and must record the residual disinfectant concentration each day that water from the groundwater source is served to the public. The groundwater system must maintain the department-determined minimum residual disinfectant concentration every day the groundwater system serves water from the groundwater source to the public. The groundwater system must take a daily grab sample during the hour of peak flow or at another time specified by the department. If any daily grab sample measurement falls below the department-determined minimum residual disinfectant concentration, the groundwater system must take follow-up samples every four hours until the residual disinfectant concentration is restored to the department-determined minimum level. Alternatively, a groundwater system that serves 3,300 or fewer people may monitor continuously and meet the requirements of 41.7(4)“b”(3)“1,” first bulleted paragraph.

2. Membrane filtration. A groundwater system that uses membrane filtration to meet the requirements of 41.7(4)“b” to provide at least 4-log treatment of viruses must monitor the membrane filtration process in accordance with all department-specified monitoring requirements and must operate the membrane filtration in accordance with all department-specified compliance requirements. A groundwater system that uses membrane filtration is in compliance with the requirement to achieve at least 4-log removal of viruses when:

- The membrane has an absolute molecular weight cut-off (MWCO), or an alternate parameter that describes the exclusion characteristics of the membrane, that can reliably achieve at least 4-log removal of viruses;

- The membrane process is operated in accordance with department-specified compliance requirements; and

- The integrity of the membrane is intact.

3. Alternative treatment. A groundwater system that uses a department-approved alternative treatment to meet the requirements of 41.7(4)“b” by providing at least 4-log treatment of viruses must:

- Monitor the alternative treatment in accordance with all department-specified monitoring requirements; and

- Operate the alternative treatment in accordance with all compliance requirements that the department determines to be necessary to achieve at least 4-log treatment of viruses.

c. Discontinuing treatment. A groundwater system may discontinue 4-log treatment of viruses for a groundwater source if the department determines and documents in writing that 4-log treatment of viruses is no longer necessary for that groundwater source. A system that discontinues 4-log treatment of viruses is subject to the source water monitoring and analytical methods requirements of 41.7(3).

d. Monitoring violation. Failure to meet the monitoring requirements of 41.7(4)“b” is a monitoring violation and requires the groundwater system to provide Tier 3 public notification under 567—subrule 42.1(4).

41.7(5) Treatment technique violations for groundwater systems. A groundwater system must give Tier 2 public notification under 567—subrule 42.1(3) for the treatment technique violations specified in 41.7(5)“a,” 41.7(5)“b,” and 41.7(5)“c.”

a. Significant deficiency. A groundwater system with a significant deficiency is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the department) of receiving written notice from the department of the significant deficiency, the system:

(1) Does not complete corrective action in accordance with any applicable department plan review processes or other department guidance and direction, including department-specified interim actions and measures; or

(2) Is not in compliance with a department-approved corrective action plan and schedule.

b. Fecal indicator-positive source sample. Unless the department invalidates a fecal indicator-positive groundwater source sample under 41.7(3)“d”(1), a groundwater system is in violation of the treatment technique requirement if, within 120 days (or earlier if directed by the department) of meeting the conditions of 41.7(4)“a”(1) or (2), the system:

(1) Does not complete corrective action in accordance with any applicable department plan review processes or other department guidance and direction, including department-specified interim measures; or

(2) Is not in compliance with a department-approved corrective action plan and schedule.

c. Failure to maintain 4-log treatment. A groundwater system subject to the requirements of 41.7(4)“b”(3) that fails to maintain at least 4-log treatment of viruses for a groundwater source is in violation of the treatment technique requirement if the failure is not corrected within four hours of the determination that the system is not maintaining at least 4-log treatment of viruses before or at the first customer.

41.7(6) Reporting and record keeping for groundwater systems.

a. Reporting. In addition to meeting the requirements of 567—subrule 42.4(1), a groundwater system regulated under this rule must provide the following information to the department:

(1) A groundwater system conducting compliance monitoring under 41.7(4)“b” must notify the department any time the system fails to meet any of the department-specified requirements for 4-log virus treatment including, but not limited to, minimum residual disinfectant concentration, membrane operating criteria or membrane integrity, and alternative treatment operating criteria, if operation in accordance with the criteria or requirements is not restored within four hours. The groundwater system must notify the department as soon as possible, but in no case later than the end of the next business day.

(2) After completing any corrective action under 41.7(4)“a,” a groundwater system must notify the department within 30 days of completion of the corrective action.

(3) If a groundwater system subject to the requirements of 41.7(3)“a” does not conduct source water monitoring under 41.7(3)“a”(5)“2,” the system must provide documentation to the department within 30 days of the total coliform-positive sample that it met the department’s criteria.

b. Record keeping. In addition to the requirements in 567—subrule 42.5(1), a groundwater system regulated under this rule must maintain the following information in its records:

(1) Documentation of corrective actions, which must be kept for a period of not less than ten years.

(2) Documentation of notice to the public as required under 41.7(4)“a”(7), which must be kept for a period of not less than three years.

(3) Records of decisions under 41.7(3)“a”(5)“2” and records of invalidation of fecal indicator-positive groundwater source samples under 41.7(3)“d”(1), both of which must be kept for a period of not less than five years.

(4) For consecutive systems, documentation of notification to the wholesale system(s) of total coliform-positive samples that are not invalidated under 41.2(1)“d,” which must be kept for a period of not less than five years.

(5) For systems, including wholesale systems, that are required to perform compliance monitoring under 41.7(4)“b”(1), the following documentation must be maintained:

1. Records of the department-specified minimum disinfectant residual, which must be kept for a period of not less than ten years.

2. Records of the lowest daily residual disinfectant concentration and records of the date and duration of any failure to maintain the department-prescribed minimum residual disinfectant concentration for a period of more than four hours, both of which must be kept for a period of not less than five years.

3. Records of department-specified compliance requirements for membrane filtration and of parameters specified by the department for department-approved alternative treatment and records of

the date and duration of any failure to meet the membrane operating, membrane integrity, or alternative treatment operating requirements for more than four hours. Documentation shall be kept for a period of not less than five years.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.8(455B) Radionuclides.

41.8(1) Radionuclides.

a. Applicability.

(1) This rule applies to all community public water supplies, and specifies the radionuclide maximum contaminant levels, analytical methodology requirements, and monitoring requirements. The radionuclide reporting requirements are listed in 567—subrule 42.4(1), the public notice requirements are listed in rule 567—42.1(455B), and the best available technology is listed in 567—subparagraph 43.3(10)“b”(3). All CWSs must comply with the requirements and maximum contaminant levels for gross alpha particle activity, radium-226, radium-228, uranium, beta particle activity, and photon emitter radioactivity. Only those CWSs designated by the department to be vulnerable to man-made radioactivity contamination are required to monitor for beta particle activity and photon emitter radioactivity. To determine whether a system is vulnerable to man-made nuclear radioactivity, the department will evaluate proximity to a nuclear facility, source water, historical analytical data, ongoing surveillance data from the nuclear facility, and any other factor considered by the department to be relevant to the vulnerability determination.

(2) Compliance dates. Community water systems must comply with the MCLs listed in 41.8(1)“b”(1) beginning December 8, 2003. Compliance shall be determined in accordance with 41.8(1)“c” through 41.8(1)“f.” Compliance with the radionuclides reporting requirements is required by December 8, 2003. All CWSs must conduct initial monitoring to determine compliance with 41.8(1)“b”(1) by December 31, 2007.

b. Maximum contaminant levels for radionuclides.

(1) Gross alpha particle activity, radium-226, radium-228, and uranium MCLs. The following table specifies the MCLs for gross alpha particles, radium, and uranium radionuclides:

| Contaminant | Maximum Contaminant Level |
|---|---------------------------|
| Gross alpha particle activity, including Radium-226 but excluding radon and uranium | 15 pCi/L |
| Combined Radium-226 and Radium-228 | 5 pCi/L ¹ |
| Uranium | 30 µg/L |

¹The combined radium-226 and radium-228 value is determined by the addition of the results of the analysis for radium-226 and the analysis for radium-228.

(2) Beta particle activity and photon radioactivity MCLs.

1. The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water must not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

2. Except for the radionuclides listed below, the concentration of man-made radionuclides causing 4 millirems total body or organ dose equivalents must be calculated on the basis of 2 liter per day drinking water intake, using the 168-hour data lists in “Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure,” National Bureau of Standards Handbook 69 as amended August 1963, United States Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ shall not exceed 4 millirems/year.

Average Annual Concentrations Assumed to Produce a
Total Body or Organ Dose of 4 mrem/year

| Radionuclide | Critical Organ | Concentration |
|--------------|----------------|---------------|
| Strontium-90 | Bone marrow | 8 pCi/L |
| Tritium | Total body | 20,000 pCi/L |

c. Compliance determinations. Compliance with 41.8(1)“b” will be determined based on the analytical results obtained at each sampling point. If one sampling point is in violation of an MCL, the system is in violation of the MCL. If the system is in violation of an MCL, the supplier of the water is required to give notice to the department in accordance with 567—subrule 42.4(1) and to notify the public as required by 567—42.1(455B).

(1) Detection limits. For the purposes of monitoring gross alpha particle activity, radium-226, radium-228, uranium, and beta particle and photon radioactivity in drinking water, “detection limit” is defined in this subparagraph.

1. For the purpose of monitoring radioactivity concentration in drinking water, the required sensitivity of the radioanalysis is defined in terms of a detection limit. The detection limit shall be that concentration which can be counted with a precision of plus or minus 100 percent at the confidence level (1.960 sigma where sigma is the standard deviation of the net counting rate of the sample).

2. To determine compliance with 41.8(1)“b”(1), the detection limit shall not exceed the following concentrations:

Detection Limits for Gross Alpha Particle Activity,
Radium-226, Radium-228, and Uranium

| Contaminant | Detection Limit |
|-------------------------------|-----------------|
| Gross alpha particle activity | 3 pCi/L |
| Radium-226 | 1 pCi/L |
| Radium-228 | 1 pCi/L |
| Uranium | 1 µg/L |

3. To determine compliance with 41.8(1)“b”(2), the detection limits shall not exceed the following concentrations:

Detection Limits for Man-Made
Beta Particle and Photon Emitters

| Contaminant | Detection Limit |
|---------------------|------------------------------|
| Gross beta | 4 pCi/L |
| Cesium-134 | 10 pCi/L |
| Iodine-131 | 1 pCi/L |
| Strontium-89 | 10 pCi/L |
| Strontium-90 | 2 pCi/L |
| Tritium | 1,000 pCi/L |
| Other radionuclides | 1/10 of the applicable limit |

(2) Compliance determination.

1. For systems monitoring more than once per year (i.e., quarterly), compliance with the MCL is determined by a running annual average at each sampling point. If the average of any sampling point is greater than the MCL, the system is immediately in violation of the MCL. If any sample result causes the

running annual average to exceed the MCL at any sample point, the system is immediately in violation of the MCL.

2. Systems monitoring annually or less frequently (i.e., one-, three-, six-, or nine-year frequency), and whose sample result exceeds the MCL, must revert to quarterly sampling for that contaminant during the next quarter. Systems are required to conduct quarterly monitoring only at the source/entry point at which the sample was collected and for the specific contaminant that triggered the system into the increased monitoring frequency. Systems triggered into increased monitoring will not be considered in violation of the MCL until they have completed one year of quarterly sampling. If any sample result causes the running annual average to exceed the MCL at any sample point, the system is immediately in violation of the MCL.

3. Systems must include all samples taken and analyzed under the provisions of this rule in determining compliance, even if that number is greater than the minimum required by the department.

4. If a system does not collect all required samples when compliance is based on a running annual average of quarterly samples, compliance will be based on the running average of the samples collected.

5. If a sample result is less than the detection limit, a value of zero will be used to calculate the annual average.

6. The department may invalidate results of obvious sampling or analytical errors.

7. Averaging and significant figures. To judge compliance with the maximum contaminant levels listed in 41.8(1)“b,” averages of data shall be used and shall be rounded to the same number of significant figures as the maximum contaminant level for the substance in question.

(3) The department will determine compliance or initiate enforcement action based upon analytical results or other information compiled by department staff or the department’s designee.

(4) The department may assign additional requirements as it deems necessary to protect the public health, including public notification requirements.

d. Analytical methodology for radionuclides. Analysis for the following contaminants shall be conducted to determine compliance with 41.8(1)“b” in accordance with the methods in the following table, or equivalent methods determined in accordance with 567—41.12(455B).

(1) Radionuclide Analytical Methodology Table.

RADIONUCLIDE ANALYTICAL METHODOLOGY

| Contaminant | Methodology | Reference (method or page number) | | | | | | | | |
|----------------------------------|---|-----------------------------------|------------------|------------------|------------------|------------------------------|-------------------|------------------------|------------------|---|
| | | EPA ¹ | EPA ² | EPA ³ | EPA ⁴ | SM ⁵ | ASTM ⁶ | USGS ⁷ | DOE ⁸ | Other |
| Naturally occurring: | | | | | | | | | | |
| Gross alpha ¹¹ & beta | Evaporation | 900.0 | p. 1 | 00-01 | p. 1 | 302, 7110B, 7110 B-00 | | R-1120-76 | | |
| Gross alpha ¹¹ | Co-precipitation | | | 00-02 | | 7110C, 7110 C-00 | | | | |
| Radium-226 | Radon emanation | 903.1 | p. 16 | Ra-04 | p. 19 | 305, 7500-Ra C, 7500Ra C-01 | D 3454-97, 05 | R-1141-76 | Ra-04 | NY ⁹ |
| | Radiochemical | 903.0 | p. 13 | Ra-03 | | 304, 7500-Ra B, 7500-Ra B-01 | D 2460-97, 07 | R-1140-76 | | GA ¹⁴ |
| Radium-228 | Radiochemical | 904.0 | p. 24 | Ra-05 | p. 19 | 7500-Ra D, 7500-Ra D-01 | | R-1142-76 | | NY ⁹ NJ ¹⁰ GA ¹⁴ |
| Uranium ¹² | Radiochemical | 908.0 | | | | 7500-U B, 7500-U B-00 | | | | |
| | Fluorometric | 908.1 | | | | 7500-U C (17th edition) | D 2907-97 | R-1180-76 R-1181-76 | U-04 | |
| | ICP-MS | 200.8 ¹³ | | | | 3125 | D 5673-03, 05, 10 | | | |
| | Alpha spectrometry | | | 00-07 | p. 33 | 7500-U C, 7500-U C-00 | D 3972-97, 02, 09 | R-1182-76 | U-02 | |
| | Laser phosphorimetry | | | | | | D 5174-97, 02, 07 | | | |
| | Alpha liquid scintillation spectrometry | | | | | | D 6239-09 | | | |
| Man-made: | | | | | | | | | | |
| Radioactive Cesium | Radiochemical | 901.0 | p. 4 | | | 7500-Cs B, 7500-Cs B-00 | D 2459-72 | R-1111-76 | | |

| Contaminant | Methodology | Reference (method or page number) | | | | | | | | |
|------------------------------|------------------------|-----------------------------------|------------------|------------------|------------------|---|--|-------------------|------------------|-------|
| | | EPA ¹ | EPA ² | EPA ³ | EPA ⁴ | SM ⁵ | ASTM ⁶ | USGS ⁷ | DOE ⁸ | Other |
| Radioactive Iodine | Gamma ray spectrometry | 901.1 | | | p. 92 | 7120, 7120-97 | D 3649-91, 98a, 06 | R-1110-76 | 4.5.2.3 | |
| | Radiochemical | 902.0 | p. 6 p. 9 | | | 7500-I B, 7500-I B-00 7500-I C, 7500-I C-00 7500-I D, 7500-I D-00 | D 3649-91, 98a, 06 | | | |
| Radioactive Strontium 89, 90 | Gamma ray spectrometry | 901.1 | | | p. 92 | 7120, 7120-97 | D 4785-93, 00a, 08 | | 4.5.2.3 | |
| | Radiochemical | 905.0 | p. 29 | Sr-04 | p. 65 | 303, 7500-Sr B, 7500-Sr B-01 | | R-1160-76 | Sr-01 Sr-02 | |
| Tritium | Liquid scintillation | 906.0 | p. 34 | H-02 | p. 87 | 306, 7500- ³ H B, 7500- ³ H B-00 | D 4107-91, 98 (Reapproved 2002), 08 | R-1171-76 | | |
| Gamma emitters | Gamma ray spectrometry | 901.1 902.0 901.0 | | | p. 92 | 7120 7500-Cs B, 7500-Cs B-00 7500-I B, 7500-I B-00 | D 3649-91, 98a, 06 D 4785-93, 00a, 08 | R-1110-76 | Ga-01-R | |

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of documents 1 through 10 was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW, Room B135, Washington, DC 20460 (telephone (202)566-2426); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.

¹“Prescribed Procedures for Measurement of Radioactivity in Drinking Water,” EPA 600/4-80-032, August 1980. Available at the US Department of Commerce, NTIS, 5285 Port Royal Road, Springfield, VA 22161 (telephone (800)553-6847) PB 80-224744.

²“Interim Radiochemical Methodology for Drinking Water,” EPA 600/4-75-008(revised), March 1976. Available at NTIS, *ibid.* PB 253258.

³“Radiochemistry Procedures Manual,” EPA 520/5-84-006, December 1987. Available at NTIS, *ibid.* PB 84-215581.

⁴“Radiochemical Analytical Procedures for Analysis of Environmental Samples,” March 1979. Available at NTIS, *ibid.* EMSL LV 053917.

⁵Standard Methods for the Examination of Water and Wastewater, 13th, 17th, 18th, 19th, 20th, 21st, and 22nd editions, 1971, 1989, 1992, 1995, 1998, 2005, and 2012. Available at American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710. Methods 302, 303, 304, 305, and 306 are only in the 13th edition. Methods 7110B, 7500-Ra B, 7500-Ra C, 7500-Ra D, 7500-U B, 7500-Cs B, 7500-I B, 7500-I C, 7500-I D, 7500-Sr B, 7500-3H B are in the 17th, 18th, 19th, 20th, 21st, and 22nd editions. Method 7110C and Method 7500-U C Alpha spectrometry are in the 18th, 19th, 20th, 21st, and 22nd editions. Method 7500-U C Fluorimetric Uranium is only in the 17th and 21st editions. Method 7120 is only in the 19th, 20th, 21st, and 22nd editions. Method 3125 is only in the 20th edition. Methods 7110 B-00, 7110 C-00, 7500-Ra B-01, 7500-Ra C-01, 7500-Ra D-01, 7500-U B-00, 7500-U C-00, 7500-I B-00, 7500-I C-00, 7500-I D-00, 7120-97, 7500-Sr B-01, and 7500-³H B-00 are available online at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

⁶Annual Book of ASTM Standards, Volumes 11.01 and 11.02, 2002. Any year containing the cited version of the method may be used. Available at ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

⁷“Methods for Determination of Radioactive Substances in Water and Fluvial Sediments,” Chapter A5 in Book 5 of Techniques of Water-Resources Investigations of the United States Geological Survey, 1977. Available at U.S. Geological Survey (USGS) Information Services, Box 25286, Federal Center, Denver, CO 80225-0425.

⁸“EML Procedures Manual,” 28th (1997) or 27th (1990) edition, Volumes 1 and 2; either edition may be used. In the 27th edition, Method Ra-04 is listed as Ra-05, and Method Ga-01-R is listed as Sect. 4.5.2.3. Available at the Environmental Measurements Laboratory, U.S. Department of Energy (DOE), 376 Hudson Street, New York, NY 10014-3621.

⁹“Determination of Ra-226 and Ra-228 (Ra-02),” January 1980, revised June 1982. Available at Radiological Sciences Institute Center for Laboratories and Research, New York State Department of Health, Empire State Plaza, Albany, NY 12201.

¹⁰“Determination of Radium-228 in Drinking Water,” August 1980. Available at State of New Jersey, Department of Environmental Protection, Division of Environmental Quality, Bureau of Radiation and Inorganic Analytical Services, 9 Ewing Street, Trenton, NJ 08625.

¹¹Natural uranium and thorium-230 are approved as gross alpha calibration standards for gross alpha with co-precipitation and evaporation methods; americium-241 is approved with co-precipitation methods.

¹²If uranium (U) is determined by mass, a 0.67 pCi/μg of uranium conversion factor must be used. This conversion factor is based on the 1:1 activity ratio of U-234 to U-238 that is characteristic of naturally occurring uranium.

¹³“Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry,” Revision 5.4, which is published in “Methods for the Determination of Metals in Environmental Samples – Supplement 1,” EPA 600-R-94-111, May 1994. Available at NTIS, PB 95-125472.

¹⁴“The Determination of Radium-226 and Radium-228 in Drinking Water by Gamma-Ray Spectrometry Using HPGW or Ge(Li) Detectors,” Revision 1.2, December 2004. Available from Environmental Resources Center, Georgia Institute of Technology, 620 Cherry Street, Atlanta, GA 30332-0335; telephone: (404)894-3776.

(2) Method references for other radionuclides. When the identification and measurement of radionuclides other than those listed in 41.8(1) “b” are required, the following references are to be used, except in cases where alternative methods have been approved in accordance with 567—41.12(455B).

1. “Procedures for Radiochemical Analysis of Nuclear Reactor Aqueous Solutions,” H. L. Krieger and S. Gold, EPA-R4-73-014, Environmental Protection Agency, Cincinnati, Ohio 45268 (May 1973).

2. "HASL Procedure Manual," edited by John H. Harley. HASL 300, ERDA Health and Safety Laboratory, New York, NY (1973).

e. Monitoring requirements for gross alpha, radium-226, radium-228, and uranium.

(1) General requirements.

1. Monitoring frequency and confirmation samples. The department may require more frequent monitoring than specified in this paragraph. The department may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

2. Monitoring period. Each PWS shall monitor during the time period designated by the department in the operation permit.

(2) Applicability and sampling locations.

1. Existing systems and sources. All existing CWSs must sample at every entry point to the distribution system that is representative of all sources being used under normal operating conditions. The system must take each sample at the same source/entry sampling point, unless conditions make another alternate sampling point more representative of each source, or the department has designated a distribution system location, in accordance with 41.8(1) "e"(3)"4." The department must approve any alternate sampling point for radionuclides.

2. New systems and sources. All new CWSs or CWSs that use a new source of water must begin to conduct initial monitoring for the new system or source within the first calendar quarter after initiating use of the system or source. More frequent monitoring must be conducted by the CWS when required by the department, in the event of possible contamination or when changes in the distribution system or treatment processes occur which may increase the concentration of radioactivity in finished water.

(3) Initial monitoring. Systems must conduct initial monitoring for gross alpha particle activity, radium-226, radium-228, and uranium as follows. If the average of the initial monitoring results for a source/entry point is above the MCL, the system must collect and analyze quarterly samples at that source/entry point until the system has results from four consecutive quarters that are at or below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the department.

1. Systems without historical monitoring data. Systems without historical monitoring data must collect four consecutive quarterly samples at all source/entry sampling points before December 31, 2007. The department may waive the final two quarters of initial monitoring from a source/entry point if the results of the samples from the previous two quarters are below the detection limit.

2. Systems with historical monitoring data and one source/entry point. Systems with only one source/entry point may use historical monitoring data collected between January 1, 2000, and December 31, 2003, from either the representative point in the distribution system or the source/entry point to satisfy the initial monitoring requirement.

3. Systems with historical source/entry point monitoring data and multiple source/entry points. Systems with multiple source/entry points that also have appropriate historical monitoring data for each source/entry point may use the monitoring data collected between January 1, 2000, and December 31, 2003, to satisfy the initial monitoring requirement.

4. Systems with historical distribution system monitoring data and multiple source/entry points. Systems with appropriate historical data for a representative point in the distribution system and multiple source/entry points may use the monitoring data collected between January 1, 2000, and December 31, 2003, provided that the department determines that the historical data satisfactorily demonstrates that each source/entry point is expected to be in compliance based upon the historical data and reasonable assumptions about the variability of contaminant levels between source/entry points. The department must make a written finding indicating how the data conforms to these requirements, in order for the data to satisfy the initial monitoring requirements.

(4) Reduced monitoring. The department may allow a CWS to reduce the future frequency of monitoring from once every three years to once every six or nine years at each source/entry point, based on the following criteria. The samples collected during the reduced monitoring period must be used to determine the monitoring frequency for subsequent monitoring periods (e.g., if a system's source/entry

point is on a nine-year frequency, and the sample result is above half of the MCL, then the next monitoring frequency for that source/entry point is three years). If a system has a monitoring result that exceeds the MCL while on reduced monitoring, the system must collect and analyze quarterly samples at that source/entry point until the system has results from four consecutive quarters that are below the MCL, unless the system enters into another schedule as part of a formal compliance agreement with the department.

1. Nine-year frequency. If the average of the initial monitoring results for each contaminant is below the detection limit specified in 41.8(1)“c”(1)“2,” the system must collect and analyze for that contaminant using at least one sample at that source/entry point every nine years.

2. Six-year frequency. If the average of the initial monitoring results for gross alpha particle activity, uranium, and combined radium-226 and radium-228 is at or above the detection limit and at or below half the MCL for that contaminant, the system must collect and analyze for that contaminant using at least one sample at that source/entry point every six years. The analytical results for radium-226 and radium-228 must be added together to yield the combined result.

3. Three-year frequency. If the average of the initial monitoring results for gross alpha particle activity, uranium, and combined radium-226 and radium-228 is above half of the MCL and at or below the MCL for that contaminant, the system must collect and analyze for that contaminant using at least one sample at that source/entry point every three years. The analytical results for radium-226 and radium-228 must be added together to yield the combined result.

(5) Composite samples. To fulfill quarterly monitoring requirements for gross alpha particle activity, radium-226, radium-228, or uranium, a system may composite up to four consecutive quarterly samples from a single entry point if analysis is done within one year of the first sample. The analytical results from the composited samples will be considered by the department as the average analytical result to determine compliance with the MCLs and to determine the future monitoring frequency. If the analytical result from the composited sample is greater than half of the MCL, the department may require additional quarterly samples from the system before the system will be allowed to sample under a reduced monitoring schedule.

(6) Data substitution using gross alpha particle activity results.

1. A gross alpha particle activity measurement may be substituted for the required uranium measurement provided that the measured gross alpha particle activity does not exceed 15 pCi/L.

2. The gross alpha particle activity measurement shall have a confidence interval of 95 percent (1.65 sigma, where sigma is the standard deviation of the net counting rate of the sample) for uranium. When a system uses a gross alpha particle activity measurement in lieu of a uranium measurement, the gross alpha particle activity analytical result will be used to determine the future monitoring frequency for uranium. If the gross alpha particle activity result is less than the detection limit, half the detection limit will be used to determine compliance and the future monitoring frequency.

f. Monitoring requirements for beta particle and photon emitters. To determine compliance with the maximum contaminant levels in 41.8(1)“b”(2) for beta particle and photon radioactivity, a system must monitor at a frequency specified in 41.8(1)“f.”

(1) General requirements.

1. Monitoring frequency and confirmation samples. The department may require more frequent monitoring than specified in 41.8(1)“f.” The department may require confirmation samples at its discretion. The results of the initial and confirmation samples will be averaged for use in compliance determinations.

2. Monitoring period. Each PWS shall monitor during the time period designated by the department in the operation permit.

(2) Systems designated by the department as vulnerable to man-made radioactivity.

1. Initial monitoring. Systems that have been determined by the department to be vulnerable to man-made radioactivity must collect quarterly samples for beta emitters and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the department of this requirement. Systems already required to conduct beta particle and

photon radioactivity monitoring must continue to sample until the department removes the monitoring requirement.

2. Reduced monitoring. The department may reduce the frequency of monitoring at that sampling point to once every three years, if the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a source/entry point has a running annual average (computed quarterly) of less than or equal to 50 pCi/L (screening level). Systems must collect all of the samples required in 41.8(1) "f"(2)"1" during the reduced monitoring period.

3. Data substitution. For a system in the vicinity of a nuclear facility, the department may allow the system to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's source/entry point(s), where the department determines such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the system's source/entry point(s) in accordance with 41.8(1) "f"(2).

(3) Systems determined to utilize waters contaminated by effluents from nuclear facilities.

1. Initial monitoring. Systems designated by the department as utilizing water contaminated by effluents from nuclear facilities must sample for beta particle and photon radioactivity. Systems must collect quarterly samples for beta emitters and iodine-131 and annual samples for tritium and strontium-90 at each entry point to the distribution system, beginning within one quarter after being notified by the department. Systems already designated by the department as systems using waters contaminated by effluents from nuclear facilities must continue to sample until the department removes the sampling requirement.

- Gross beta particle activity. Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples or the analysis of a composite of three monthly samples. The former is recommended.

- Iodine-131. A composite of five consecutive daily samples shall be analyzed once each quarter for iodine-131. The department may require more frequent monitoring when iodine-131 is identified in the finished water.

- Strontium-90 and tritium. Annual monitoring for strontium-90 and tritium shall be conducted by means of the analysis of a composite of four consecutive quarterly samples or analysis of four quarterly samples. The latter procedure is recommended.

2. Reduced monitoring. If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity at a sampling point has a running annual average (computed quarterly) less than or equal to 15 pCi/L (screening level), the department may reduce the frequency of monitoring at that sampling point to every three years. Systems must collect all samples required in 41.8(1) "f"(3) during the reduced monitoring period.

3. Data substitution. For systems in the vicinity of a nuclear facility, the department may allow the CWS to utilize environmental surveillance data collected by the nuclear facility in lieu of monitoring at the system's entry point(s), where the department determines such data is applicable to a particular water system. In the event that there is a release from a nuclear facility, systems which are using surveillance data must begin monitoring at the CWS source/entry point in accordance with 41.8(1) "f"(2)"1."

(4) Monitoring frequency waiver. A CWS designated by the department to monitor for beta particle and photon radioactivity cannot apply to the department for a waiver from the monitoring frequencies specified in 41.8(1) "f"(2) or (3).

(5) Community water systems may analyze for naturally occurring potassium-40 beta particle activity from the same or an equivalent sample used for the gross beta particle activity analysis. Systems are allowed to subtract the potassium-40 beta particle activity value from the total gross beta particle activity value to determine if the screening level is exceeded. The potassium-40 beta particle activity must be calculated by multiplying elemental potassium concentrations (in mg/L) by a factor of 0.82.

(6) If the gross beta particle activity minus the naturally occurring potassium-40 beta particle activity exceeds the appropriate screening level, an analysis of the sample must be performed to identify the major radioactive constituents present in the sample, and the appropriate doses must be calculated and summed to determine compliance with 41.8(1) "b"(2)"1," using the formula in 41.8(1) "b"(2)"2."

Doses must also be calculated and combined for measured levels of tritium and strontium to determine compliance.

(7) Monitoring after an MCL violation. Systems must monitor monthly at the sampling point(s) which exceed the maximum contaminant level in 41.8(1)“b”(2) beginning the month after the exceedance occurs. Systems must continue monthly monitoring until the system has established, by a rolling average of three monthly samples, that the MCL is being met. Systems that establish that the MCL is being met must return to quarterly monitoring until they meet the requirements set forth in 41.8(1)“f”(2) or 41.8(1)“f”(3)“2.”

41.8(2) Reserved.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—41.9(455B) Sampling and analytical requirements for radionuclides. Rescinded IAB 1/7/04, effective 2/11/04.

567—41.10(455B) Reporting, public notification and record keeping. Rescinded IAB 8/11/99, effective 9/15/99.

567—41.11(455B) Special monitoring.

41.11(1) Special monitoring for sodium. Suppliers of water for community public water systems shall collect and have analyzed one sample per source or plant, for the purpose of determining the sodium concentration in the distribution system. Systems utilizing multiple wells that draw raw water from a single aquifer may, with departmental approval, be considered as one source for determining the minimum number of samples to be collected. Sampling frequency and approved analytical methods are as follows:

a. Surface water systems. Systems utilizing a surface water source, in whole or in part, shall monitor for sodium at least once annually at the entry point to the distribution system.

b. Groundwater systems. Systems utilizing groundwater sources shall monitor at least once every three years at the entry point to the distribution system.

c. Increased monitoring. Suppliers may be required to monitor more frequently where sodium levels are variable or if certain types of treatment are used, such as cation exchange softening.

d. Analytical methodology. Analyses for sodium shall be performed in accordance with 41.3(1)“e”(1).

e. Reporting. The sodium level shall be reported to the public by at least one of the following methods:

(1) The community public water supply shall notify the appropriate local public health officials of the sodium levels by written notice by direct mail within three months of receipt of the analytical results. A copy of each notice required by this subrule shall be sent to the department within ten days of its issuance.

(2) In lieu of the reporting requirement of 41.11(1)“e”(1), the community public water supply shall include the sodium level in its annual consumer confidence report, pursuant to 567—paragraph 42.3(3)“c”(1)“12.”

f. CWSs using cation exchange treatment. Community water systems which utilize cation exchange treatment are required to collect one sodium sample of the finished water per year after all treatment. Analysis and reporting must be done in accordance with 41.11(1)“d” and “e.”

41.11(2) Special monitoring for ammonia. Ammonia in the groundwater is a precursor to the development of nitrite and nitrate in a drinking water system. Both nitrite and nitrate are contaminants with acute health effects. This subrule lists the ammonia analytical methodology, sample preservation requirements, and holding times to be used for drinking water samples.

a. Analytical methodology. Analyses for ammonia shall be performed in accordance with the following methodology, with a detection limit of 0.1 mg/L ammonia as N:

| Methodology | EPA ¹ | Standard Methods (20th edition) | ASTM | USGS ² | Other |
|---|------------------|---------------------------------|-------------|-------------------|-----------------------|
| Manual distillation at pH 9.5 ⁴ , followed by: | 350.2 | 4500-NH3 B | | | 973.49 ³ |
| Titration | 350.2 | 4500-NH3 C | | | |
| Manual electrode | 350.3 | 4500-NH3 D or E | D1426-93(B) | | |
| Automated phenate | 350.1 | 4500-NH3 G | | I-4523-85 | |
| Automated electrode | | | | | See note ⁵ |

¹“Methods for Chemical Analysis of Water and Wastes,” Environmental Protection Agency, EPA-600/4-79-020, Revised March 1983 and 1979 where applicable.

²Fishman, M.J., et al., “Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments,” U.S. Department of the Interior, Techniques of Water—Resource Investigations of the U.S. Geological Survey, Denver, CO, Revised 1989, unless otherwise stated.

³“Official Methods of Analysis of the Association of Official Analytical Chemists,” 15th edition, 1990.

⁴Manual distillation is not required if the samples are very low in turbidity; however, manual distillation should be used whenever matrix interferences could be present in the sample, and will be required to resolve any controversies.

⁵Ammonia, Automated Electrode Method, Industrial Method Number 379-75 WE, dated February 19, 1976, Bran & Luebbe (Technicon) Auto Analyzer II, Bran & Luebbe Analyzing Technologies, Inc., Elmsford, NY 10523.

b. Sample preservation and holding time. The system must collect a 500 mL grab sample into a plastic or glass bottle. The sample must be acidified at the time of collection to a pH of less than 2 by the addition of sulfuric acid (H₂SO₄) and refrigerated at 4 degrees Celsius. The sample must be analyzed within 28 days. If the sample is analyzed within 24 hours of collection, the sample acidification is not required.

567—41.12(455B) Alternative analytical techniques. With the written permission of this department, concurred in by the EPA, an alternative analytical technique may be employed. An alternative technique shall be acceptable only if it is substantially equivalent to the prescribed test in both precision and accuracy as it relates to the determination of compliance with any maximum contaminant level. The use of the alternative analytical technique shall not decrease the frequency of monitoring required by 567—41.2(455B) through 567—41.8(455B).

567—41.13(455B) Monitoring of interconnected public water supply systems. When a public water supply system supplies water to one or more other public water supply systems, the department may modify the monitoring requirements imposed by this part to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the department and concurred in by the administrator of the U.S. Environmental Protection Agency.

567—41.14(455B) Department analytical results used to determine compliance. Analytical results or other information compiled by departmental staff may be used to determine compliance with the maximum contaminant levels, action levels, or treatment techniques listed in 567—Chapters 41 and 43 or for initiating remedial action with respect to these violations.

567—41.15(455B) Monitoring of other contaminants. If the department determines that other contaminants are present in a public water supply, and the contaminants are known to pose, or scientific evidence strongly suggests that they pose, a threat to human health, the supplier of water may be required to monitor for such contaminants. The supplier of water will monitor at a frequency and in a manner which will adequately identify the magnitude and extent of the contamination. The monitoring frequency and sampling location will be determined by the department. All analytical results will be obtained using approved EPA methods and all analytical results will be submitted to the department

for review and evaluation. Any monitoring required under this paragraph will be incorporated into an operation permit or an order.

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

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[◇] Two or more ARCs

¹ Effective date of [ARC4359A] 41.3(1) “b”(2)“3”; 41.3(1) “c”(2)“4,” new sentence at end; 41.3(1) “c”(3)“6,” “10”; 41.3(1) “c”(8), first sentence; 41.4(1) “d”(5)“4”; 41.5(1) “a”; 41.10(7) “a”(3); 41.11(2) “a”; 41.11(2) “c”(4); 41.11(2) “c”(5), first sentence, delayed 70 days by the Administrative Rules Review Committee at its meeting held November 9, 1993; delay lifted by the Committee December 14, 1993.

CHAPTER 42
PUBLIC NOTIFICATION, PUBLIC EDUCATION,
CONSUMER CONFIDENCE REPORTS, REPORTING,
AND RECORD MAINTENANCE

567—42.1(455B) Public notification.

42.1(1) Applicability. Each owner or operator of a public water system must give notice for all violations of public drinking water rules and for other situations, as listed in this subrule. The term “violations” includes violations of, or failure to comply with, the maximum contaminant level, maximum residual disinfection level, treatment technique, monitoring requirements, and testing procedures in 567—Chapters 40 through 43. The term “other situations” includes all situations determined by the department to require a public notice, such as a waterborne disease outbreak or other waterborne emergency; exceedance of the nitrate MCL by noncommunity systems where granted permission by the department under 567—paragraph 41.3(1)“a”; exceedance of fluoride level over 2.0 mg/L; availability of unregulated contaminant monitoring data in accordance with CFR Title 40, Part 141.40, failure to meet the terms of a compliance schedule; exceedance of a health advisory as determined by the department; failure to comply with the public notification requirements, public education requirements, or consumer confidence report requirements; failure to meet the terms of an administrative or court order; failure to meet the data and other reporting requirements; failure to retain a certified operator in accordance with 567—subrule 43.1(5); and any other situation where the department determines public notification is needed. Public notification is not required for ammonia monitoring conducted pursuant to 567—subrule 41.11(2).

a. Types of public notice. Public notice requirements are divided into three tiers, to take into account the seriousness of the violation or situation and of any potential adverse health effects that may be involved. The public notice requirements for each violation or situation are determined by the tier to which it is assigned.

(1) Tier 1 public notice is required for all drinking water violations and situations with significant potential to have serious adverse effects on human health as a result of short-term exposure.

(2) Tier 2 public notice is required for all other drinking water violations and situations with potential to have serious adverse effects on human health.

(3) Tier 3 public notice is required for all other drinking water violations and situations not included in Tier 1 or Tier 2.

b. Notification. Each public water system must provide public notice to persons served by the water system, in accordance with this rule. A copy of the notice must also be sent to the department, in accordance with the requirements under paragraph 42.4(1)“c.”

(1) Consecutive systems. Public water systems that sell or otherwise provide drinking water to other public water systems (i.e., to consecutive systems) are required to give public notice to the owner or operator of the consecutive system. The consecutive system is responsible for providing public notice to the persons it serves, and must meet the appropriate Tier requirements for the violation.

(2) Systems with multiple physically or hydraulically isolated distribution systems. If a public water system has a violation in a portion of the distribution system that is physically or hydraulically isolated from other parts of the distribution system, the department may allow the system to limit distribution of the public notice only to persons served by that portion of the system which is out of compliance. Permission by the department to limit distribution of the notice must be granted in writing.

42.1(2) Tier 1 public notice requirements.

a. Violations and situations which require Tier 1 notice. The following types of violations or situations require Tier 1 public notice:

(1) Violation of the MCL for *E. coli*, as specified in 567—paragraph 41.2(1)“a.”

(2) Rescinded IAB 4/11/18, effective 5/16/18.

(3) Violation of the MCL for nitrate or nitrite, as defined in 567—subparagraph 41.3(1)“b”(1).

(4) Failure by the water system to collect a confirmation sample within 24 hours of the system's receipt of the first sample result showing an exceedance of the nitrate or nitrite MCL, when directed by the department, as specified in 567—paragraph 41.3(1)“c”(7)“2.”

(5) Exceedance of the nitrate MCL by noncommunity water systems, where permitted to exceed the MCL by the department under 567—paragraph 41.3(1)“a,” as required under 42.1(7)“c.”

(6) Violation of the MRDL for chlorine dioxide when one or more samples, taken in the distribution system on the day following an exceedance of the MRDL in the sample collected at the entrance to the distribution system, exceeds the MRDL, as defined in 567—paragraph 43.6(1)“b.”

(7) Failure by the water system to collect the required chlorine dioxide samples in the distribution system on the day following an exceedance of the MRDL in the sample collected at the entrance to the distribution system.

(8) Violation of the treatment technique requirement by a surface water or influenced groundwater public water system resulting from a single exceedance of the maximum allowable turbidity limit, as specified in rule 567—43.5(455B), 567—43.9(455B), or 567—43.10(455B), where the department determines after consultation with the system that a Tier 1 notice is required, or where the consultation with the department does not take place within 24 hours after the system learns of the violation.

(9) Occurrence of a waterborne disease outbreak, as defined in rule 567—40.2(455B), or other waterborne emergency, such as a failure or significant interruption in key water treatment processes, a natural disaster that disrupts the water supply or distribution system, or a chemical spill or unexpected loading of possible pathogens into the source water that significantly increases the potential for drinking water contamination.

(10) Other violations or situations with significant potential to have serious adverse effects on human health as a result of short-term exposure, as determined by the department either in its rules or on a case-by-case basis.

(11) Detection of *E. coli*, enterococci, or coliphage in source water samples, as specified in 567—paragraphs 41.7(3)“a” and 41.7(3)“b.”

b. Timing of Tier 1 public notice. Public water systems must:

(1) Provide a public notice as soon as practical but no later than 24 hours after the system learns of the violation;

(2) Initiate consultation with the department as soon as practical, but no later than 24 hours after the system learns of the violation or situation, to determine additional public notice requirements. For consultation with department staff after normal business hours, the system should contact the department via the department's Environmental Emergency Reporting Hotline telephone number (515)725-8694; and

(3) Comply with any additional public notification requirements, including any repeat notices or direction on the duration of the posted notices, that are established as a result of the consultation with the department. Such requirements may include the timing, form, manner, frequency, and content of repeat notices (if any) and other actions designed to reach all persons served. All NTNCs must notify the parent or legal guardian of each child under 18 years of age and of any nursing home resident of the Tier 1 violation as soon as possible and within 72 hours, including the information required in the public notice under subrule 42.1(5).

c. Form and manner of Tier 1 public notice. Public water systems must provide the notice within 24 hours in a form and manner reasonably calculated to reach all persons served. The form and manner used by the public water system must fit the specific situation, and must be designed to reach residential, transient, and nontransient users of the water system. In order to reach all persons served, water systems are to use, at a minimum, one or more of the following forms of delivery. The department may require that multiple forms of notification be used in a specific situation.

(1) Appropriate broadcast media, such as radio or television;

(2) Posting of the notice in conspicuous locations throughout the area served by the water system;

(3) Hand delivery of the notice to persons served by the water system; or

(4) Another delivery method approved in writing by the department.

42.1(3) Tier 2 public notice requirements.

a. Violations and situations which require Tier 2 notice. The following types of violations or situations require Tier 2 public notice:

(1) All violations of the MCL, MRDL, and treatment technique requirements, except where a Tier 1 notice is required under subrule 42.1(2);

(2) Violations of the monitoring and testing procedure requirements, where the department determines that a Tier 2 rather than a Tier 3 public notice is required, taking into account potential health impacts and persistence of the violation;

(3) Failure to comply with the requirements of any compliance schedule prescribed in an operation permit, administrative order, or court order pursuant to 567—subrule 43.2(5);

(4) Failure to comply with a health advisory as determined by the department; and

(5) Failure to take corrective action or failure to maintain at least 4-log treatment of viruses (using inactivation, removal, or a department-approved combination of 4-log virus inactivation and removal) before or at the first customer under 567—paragraph 41.7(4)“a.”

b. Timing of Tier 2 public notice. Public water systems must:

(1) Provide the initial public notice as soon as practical, but no later than 30 days after the system learns of the violation. If the public notice is posted, the notice must remain in place for as long as the violation or situation persists, but in no case for less than 7 days, even if the violation or situation is resolved. The department may allow additional time for the initial notice of up to three months from the date the system learns of the violation; however, such an extension must be on a case-by-case basis and be made in writing by the department.

(2) The public water system must repeat the notice every three months as long as the violation or situation persists, unless the department determines that appropriate circumstances warrant a different repeat frequency. If the department determines that a repeat notice frequency of longer than every three months is allowed, that decision must be made in writing by the department and must be on a case-by-case basis. In no circumstance may the repeat notice be given less frequently than once per year. Repeat notices for a coliform bacteria MCL, a treatment technique violation under 567—paragraph 41.2(1)“a” or 41.2(1)“l,” or a turbidity treatment technique violation under rule 567—43.9(455B) or 567—43.10(455B) must be made every three months or more frequently.

(3) A public water system using surface water or influenced groundwater with a treatment technique violation resulting from a single exceedance of the maximum allowable turbidity limit pursuant to 567—43.9(455B) or 567—43.10(455B) must consult with the department as soon as practical, but no later than 24 hours after the public water system learns of the violation, to determine whether a Tier 1 or Tier 2 public notice is required to protect public health. For consultation with department staff after normal business hours, the system should contact the department via the department’s Environmental Emergency Reporting Hotline telephone number (515)725-8694. If the consultation does not occur within the 24-hour period, the public water system must distribute a Tier 1 notice of the violation within the next 24 hours, or no later than 48 hours after the system learns of the violation, following the requirements of paragraphs 42.1(2)“b” and 42.1(2)“c.”

c. Form and manner of Tier 2 public notice. Public water systems must provide the initial public notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of public water system, but it must at a minimum meet the following requirements:

(1) Community water systems must provide notice by the following methods, unless directed otherwise in writing by the department:

1. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

2. Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by mail or direct delivery. Such persons may include those who do not pay water bills or do not have service connection addresses, such as house renters, apartment dwellers, university students, nursing home patients, or prison inmates. Other methods may include:

- Publication in a local newspaper;

- Delivery of multiple copies for distribution by customers that provide their drinking water to others, such as apartment building owners or large private employers;
- Posting in public places served by the system or on the Internet; or
- Delivery of the notice to community organizations.

(2) Noncommunity water systems (TNC and NTNC) must provide notice by the following methods, unless directed otherwise in writing by the department:

1. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

2. Any other method reasonably calculated to reach other persons served by the system who would not normally be reached by posting, mail, or direct delivery. Such persons may include those served who may not see a posted notice because the posted notice is not in a location they routinely visit. Other methods may include:

- Publication in a local newspaper or newsletter distribution to customers;
- Use of electronic mail (email) to notify employees or students; or
- Delivery of multiple copies in central locations, such as community centers.

3. In addition to the requirements in 42.1(3)“c”(2)“1” and “2,” nontransient noncommunity public water systems that serve children under 18 years of age, such as child care facilities, schools, and hospitals, or nursing home residents, including elder care facilities, shall provide the public notice in writing to the parent or legal guardian of each person within the time period specified by the department. The content of the public notice must meet the requirements of subrule 42.1(5).

42.1(4) Tier 3 public notice requirements.

a. Violations and situations which require Tier 3 notice. The following types of violations or situations require Tier 3 public notice:

(1) Monitoring violations under 567—Chapters 41, 42, and 43, except where a Tier 1 notice is required under subrule 42.1(2) or where the department determines that a Tier 2 notice is required;

(2) Failure to comply with a testing procedure established in 567—Chapters 41, 42, and 43, except where a Tier 1 notice is required under subrule 42.1(2) or where the department determines that a Tier 2 notice is required;

(3) Availability of unregulated contaminant monitoring results, as required of certain public water supply systems by CFR Title 40, Part 141.40, as required under paragraph 42.1(7)“a”;

(4) Exceedance of the fluoride level of 2.0 mg/L and not exceeding the MCL of 4.0 mg/L, as required under paragraph 42.1(7)“b”;

(5) Failure to report data or analytical results required under 567—Chapters 41, 42, and 43 to the department;

(6) Failure to meet the requirements of this chapter for public notification, public education, or the development and distribution of the Consumer Confidence Report;

(7) Failure to retain a certified operator in accordance with 567—subrule 43.1(5) and the department determines that public notification is required;

(8) Failure to maintain records required under 567—Chapters 41, 42, and 43; and

(9) Any other situation where the department determines public notification is needed.

b. Timing of Tier 3 public notice.

(1) Initial notice.

1. For violations or situations listed in subparagraphs 42.1(4)“a”(1), (2), (5), and (6), public water systems must provide the initial public notice within 12 months after the public water system learns of the violation or situation. If the violation pertains to a contaminant that could have acute health effects as determined by the department, such as coliform bacteria, nitrate, nitrite, or turbidity, the initial public notice must be provided within 3 months. If the public notice is posted, the notice must remain in place for as long as the violation or other situation persists, but in no case less than seven days, even if the violation or situation is resolved.

2. For availability of unregulated contaminant monitoring results pursuant to subparagraph 42.1(4)“a”(3), the system must provide the initial public notice within 12 months of receiving the unregulated contaminant monitoring results.

3. For subparagraphs 42.1(4)“a”(4), (7), and (8), the timing of the initial notice is at the discretion of the department, but the notice must be made within 12 months of the violation or situation.

(2) Repeat notice.

1. For violations or situations listed in subparagraphs 42.1(4)“a”(1), (2), (4), (5), and (6), public water systems must repeat the public notice every 12 months in which the violation or situation persists. If the violation pertains to a contaminant that could have acute health effects, such as coliform bacteria, nitrate, nitrite, or turbidity, the system must repeat the public notice every 3 months in which the violation or situation persists. If the public notice is posted, the notice must remain in place for as long as the violation or other situation persists, but in no case less than seven days, even if the violation or situation is resolved.

2. For availability of unregulated contaminant monitoring results pursuant to subparagraph 42.1(4)“a”(3), the system is not required to repeat the public notice, once the initial public notice requirement has been met.

3. For subparagraphs 42.1(4)“a”(4), (7), and (8), the requirement for and timing of the repeat notice is at the discretion of the department and, if required, the notice must be made within 12 months of the initial notice.

c. Form and manner of Tier 3 public notice. Public water systems must provide the initial notice and any repeat notices in a form and manner that is reasonably calculated to reach persons served in the required time period. The form and manner of the public notice may vary based on the specific situation and type of water system, but it must at a minimum meet the following requirements:

(1) Community water systems. Unless directed otherwise in writing by the department, community water systems must provide notice by:

1. Mail or other direct delivery to each customer receiving a bill and to other service connections to which water is delivered by the public water system; and

2. Any other method reasonably calculated to reach other persons regularly served by the system, if they would not normally be reached by mail or direct delivery notice. Such persons may include those who do not pay water bills or do not have service connection addresses, such as house renters, apartment dwellers, university students, nursing home patients, or prison inmates. Other methods may include:

- Publication in a local newspaper;
- Delivery of multiple copies for distribution by customers that provide their drinking water to others, such as apartment building owners or large private employers;
- Posting in public places or on the Internet; or
- Delivery of the notice to community organizations.

3. Use of the Consumer Confidence Report for initial and repeat notices. For community water systems, the Consumer Confidence Report (CCR) required under 567—42.3(455B) may be used as a vehicle for the initial Tier 3 public notice and all required repeat notices, as long as:

- The CCR is provided to persons served within the time frames specified in 42.1(4)“b”;
- The Tier 3 notice contained in the CCR follows the content requirements under 42.1(5); and
- The CCR is distributed following the delivery requirements under 42.1(4)“c”(1) and (2).

(2) Noncommunity systems (TNC and NTNC). Unless directed otherwise in writing by the department, noncommunity water systems must provide notice by:

1. Posting the notice in conspicuous locations throughout the distribution system frequented by persons served by the system, or by mail or direct delivery to each customer and service connection (where known); and

2. Any other method reasonably calculated to reach other persons served by the system, if they would not normally be reached by the posted, mailed, or delivered notice. Such persons may include those who may not see a posted notice because the notice is not in a location they routinely visit. Other methods may include:

- Publication in a local newspaper or newsletter distributed to employees;

- Use of electronic mail (email) to notify employees or students; or
- Delivery of multiple copies in central locations, such as community centers.

42.1(5) Content of the public notice.

a. Required public notice elements. Each public notice must include the following elements:

- (1) A description of the violation or situation, including the contaminant(s) of concern and, as applicable, the contaminant level(s);
- (2) When the violation or situation occurred;
- (3) Any potential adverse health effects from the violation or situation, including the standard language under subparagraph 42.1(5) “c”(1) or (2), whichever is applicable;
- (4) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in their drinking water;
- (5) Whether alternative water supplies or bottled water should be used, or require a boil-water order;
- (6) What actions consumers should take, including when they should seek medical help, if known;
- (7) What the system is doing to correct the violation or situation;
- (8) When the water system expects to return to compliance or resolve the situation;
- (9) The name, business address, and telephone number of the water system owner, operator, or designee of the public water system as a source of additional information concerning the notice; and
- (10) A statement to encourage the notice recipient to distribute the public notice to other persons served, using the standard language under subparagraph 42.1(5) “c”(3), where applicable.

b. Appearance and presentation of the public notice.

- (1) Each public notice must:
 1. Be displayed in a conspicuous way when printed or posted;
 2. Not contain overly technical language or very small print;
 3. Not be formatted in a way that defeats the purpose of the notice; and
 4. Not contain language that nullifies the purpose of the notice.
- (2) Each public notice must comply with multilingual requirements, as follows:
 1. For public water systems serving a large proportion of non-English speaking consumers, as determined by the department, the public notice must contain information in the appropriate language(s) about the importance of the notice. Alternately, the public notice must contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the notice or to request assistance in the appropriate language.
 2. In cases where the department has not determined what constitutes a large proportion of non-English speaking consumers, the public water system must include in the public notice the same information as in 42.1(5) “b”(2)“1,” where appropriate, to reach a large proportion of non-English speaking persons served by the water system.

c. Standard language requirements. Public water systems are required to include the following standard language in their public notice:

(1) Standard language about health effects for MCL violations, MRDL violations, or treatment technique violations. Public water systems must include in each public notice the language about health effects specified in Appendix A for the specific contaminant, disinfectant residual, or treatment technique that incurred the violation.

(2) Standard language for monitoring and testing procedure violations. Public water systems must include the following language in their notice, including the bracketed language necessary to complete the notice, for all monitoring and testing procedure violations:

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we [use either the phrase “did not monitor or test” or “did not complete all monitoring or testing,” whichever is more applicable] for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time.

(3) Standard language to encourage the distribution of the public notice to all persons served. Public water systems must include in their notice the following language, where applicable:

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly, such as people in apartments, nursing homes, schools, and businesses. You can do this by posting this notice in a public place or distributing copies by hand or mail.

42.1(6) Notice to new billing units or new customers.

a. Community water systems. Community water systems must give a copy of the most recent public notice for any continuing violation or other ongoing situations requiring a public notice to all new billing units or new customers prior to or at the time service begins.

b. Noncommunity water systems. Noncommunity water systems must continuously post the public notice in conspicuous locations in order to inform new consumers of any continuing violation or other situation requiring a public notice for as long as the violation or other situation persists.

42.1(7) Special notices.

a. Availability of unregulated contaminant monitoring results.

(1) **Applicability.** The owner or operator of a community water system or nontransient noncommunity water system required to monitor under the federal unregulated contaminant monitoring rule must notify persons served by the system of the availability of the results of such sampling no later than 12 months after the monitoring results are known.

(2) **Form and manner of notice.** The form and manner of the public notice must follow the requirements for a Tier 3 public notice prescribed in paragraph 42.1(4)“c.” The notice must also identify a person and provide the telephone number to contact for information on the monitoring results.

b. Fluoride level between 2.0 and 4.0 mg/L at community or nontransient noncommunity water systems.

(1) **Applicability.** Community and nontransient noncommunity water systems that exceed the fluoride level of 2.0 mg/L as determined by the last single sample taken in accordance with 567—paragraph 41.3(1)“c” but do not exceed the MCL of 4.0 mg/L, must provide the public notice in subparagraph 42.1(7)“b”(5) to persons served. If the nontransient noncommunity public water system is a school or child care facility that serves children under nine years of age, the public water system shall provide the public notice in writing to the legal guardians of each child within the time period specified by the department.

(2) **Initial notice.** Public notice must be provided as soon as practical but no later than three months from the day the water system learns of the exceedance. A copy of the notice must also be sent to all new billing units and new customers at the time service begins and to the Public Health Dental Director, Iowa Department of Public Health, Lucas State Office Building, Des Moines, Iowa 50319-0075.

(3) **Repeat notice.** The public water system must repeat the notice at least every three months for as long as the fluoride level exceeds 2.0 mg/L. If the public notice is posted, the notice must remain in place for as long as the fluoride level exceeds 2.0 mg/L, but in no case less than seven days (even if the exceedance is eliminated). The department may require the repeat notice to be conducted more frequently.

(4) **Form and manner of notice.** The form and manner of the public notice, including repeat notices, must follow the requirements for a Tier 3 public notice in paragraph 42.1(4)“c.”

(5) **Mandatory language.** The notice must contain the following language, including the bracketed language necessary to complete the notice:

This is an alert about your drinking water and a cosmetic dental problem that might affect children under nine years of age. At low levels, fluoride can help prevent cavities, but children drinking water containing more than 2 milligrams per liter (mg/L) of fluoride may develop cosmetic discoloration of their permanent teeth, called dental fluorosis. The drinking water provided by your public water system [PWS name] has a fluoride concentration of [analytical result] mg/L.

Dental fluorosis, in its moderate or severe forms, may result in a brown staining and pitting of the permanent teeth. This problem occurs only in developing teeth, before they erupt from the gums. Children under nine should be provided with alternative sources of drinking water or water that has been treated to remove the fluoride to avoid the possibility of staining and pitting of their

permanent teeth. You may also want to contact your dentist about proper use by young children of fluoride-containing products. Older children and adults may safely drink the water.

Drinking water containing more than 4.0 mg/L of fluoride (the U.S. Environmental Protection Agency's drinking water standard) can increase your risk of developing bone disease. Your drinking water does not contain more than 4.0 mg/L of fluoride, but we are required to notify you when we discover that the fluoride levels in your drinking water exceed 2.0 mg/L because of this cosmetic dental problem.

For more information, please call [name of the person designated as the water system contact] of [name of public water system] at [telephone number]. Some home water treatment units are also available to remove fluoride from drinking water. In Iowa, home water treatment units are regulated under 641—Chapter 14, with the water treatment unit registration program administered by the Iowa department of public health's environmental health division. In addition, you may call the National Sanitation Foundation (NSF) International, at 1-877-867-3435.

c. Nitrate level between 10 and 20 mg/L for noncommunity water systems, where allowed by the department.

(1) Applicability. The owner or operator of a noncommunity water system granted permission by the department under 567—paragraph 41.3(1)“a” to exceed the nitrate MCL must provide notice to persons served according to the requirements for a Tier 1 notice under paragraphs 42.1(2)“a” and “b.”

(2) Form and manner of notice. Noncommunity water systems granted permission by the department to exceed the nitrate MCL under 567—paragraph 41.3(1)“a” must provide continuous posting of the fact that nitrate levels exceed 10 mg/L and the potential health effects of exposure, according to the requirements for Tier 1 notice delivery under paragraph 42.1(2)“c” and the content requirements under subrule 42.1(5).

d. Repeated failure to conduct monitoring of the source water for Cryptosporidium.

(1) Applicability. The owner or operator of any public water system that is required to monitor source water under 567—43.11(455B) must notify persons served by the water system that monitoring has not been completed as specified no later than 30 days after the system has failed to collect samples in any three months of monitoring as specified in 567—paragraph 43.11(3)“a.” The notice must be repeated as specified in 42.1(3).

(2) Form and manner of notice. The form and manner of the special notice must follow the Tier 2 public notice requirements in 42.1(3) and be presented as required in 42.1(5)“b.”

(3) Mandatory language. The special notice must contain the following language, including the language necessary to fill in the brackets.

“We are required to monitor the source of your drinking water for *Cryptosporidium*. Results of the monitoring are to be used to determine whether water treatment at the [treatment plant name] is sufficient to adequately remove *Cryptosporidium* from your drinking water. We are required to complete this monitoring and make this determination by [required bin determination date]. We [“did not monitor or test” or “did not complete all monitoring or testing”] on schedule and, therefore, we may not be able to determine by the required date what treatment modifications, if any, must be made to ensure adequate *Cryptosporidium* removal. Missing this deadline may, in turn, jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of [date]. For more information, please call [name of water system contact] of [name of water system] at [telephone number].”

(4) Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

e. Failure to determine bin classification or mean Cryptosporidium level.

(1) Applicability. The owner or operator of a public water system that is required to determine a bin classification under 567—subrule 43.11(5) must notify persons served by the water system that the determination has not been made as required no later than 30 days after the system has failed to report the determination as specified in 567—paragraph 43.11(5)“c.” The notice must be repeated as specified in 42.1(3). The notice is not required if the system is in compliance with a department-approved schedule to address the violation.

(2) Form and manner of notice. The form and manner of the special notice must follow the Tier 2 public notice requirements in 42.1(3) and be presented as required in 42.1(5) “b.”

(3) Mandatory language. The special notice must contain the following language, including the language necessary to fill in the brackets.

“We are required to monitor the source of your drinking water for *Cryptosporidium* in order to determine by [date] whether water treatment at the [treatment plant name] is sufficient to adequately remove *Cryptosporidium* from your drinking water. We have not made this determination by the required date. Our failure to do this may jeopardize our ability to have the required treatment modifications, if any, completed by the required deadline of [date]. For more information, please call [name of water system contact] of [name of water system] at [telephone number].”

(4) Each special notice must also include a description of what the system is doing to correct the violation and when the system expects to return to compliance or resolve the situation.

42.1(8) Notice by department on behalf of the public water system. The department may give the public notice on behalf of the owner or operator of the public water system if the department complies with the public notification requirements of this rule. However, the owner or operator of the public water system remains responsible for ensuring the public notification requirements of this rule are met.

42.1(9) Public notice requirements in the operation permit compliance schedule. When the department determines that a public water supply system cannot promptly comply with one or more maximum contaminant levels pursuant to 567—Chapter 41, and that there is no immediate, unreasonable risk to the health of persons served by the system, an operation permit will be drafted that may include interim contaminant levels or a compliance schedule. The permit applicant may be required by the department to present the reasons the system cannot come into immediate compliance. Prior to issuance of a final permit, notice and opportunity for public participation must be given in accordance with this subrule. The notice shall be circulated in a manner designed to inform interested and potentially interested persons of any proposed interim contaminant level or compliance schedule.

a. Preparation of notice. The public notice shall be prepared by the department and circulated by the applicant within its geographical area through publication in a local newspaper with general circulation or through mail or direct delivery to the system’s customers. The public notice shall be mailed by the department to any person upon request.

b. Public comment period. The department shall provide a period of at least 30 days following the date of the public notice during which time interested persons may submit their written views on the tentative determinations with respect to the operation permit. All written comments submitted during the 30-day comment period shall be retained by the department and considered in the formulation of the department’s final determination with respect to the operation permit. The department may extend the comment period.

c. Content of notice. The content of the public notice of a proposed operation permit shall include at least the following:

- (1) The name, address, and telephone number of the department.
- (2) The name and address of the applicant.
- (3) A statement of the department’s tentative determination to issue the operation permit.
- (4) A brief description of each applicant’s water supply operations which necessitate the proposed permit conditions.

(5) A brief description of the procedures for the formulation of final determinations, including the 30-day comment period required by 42.1(9) “b.”

(6) The right to request a public hearing pursuant to 42.1(9) “d” and any other means by which interested persons may influence or comment upon those determinations.

(7) The address and telephone number of places at which interested persons may obtain further information, request a copy of the proposed operation permit prepared pursuant to 42.1(9), and inspect and copy the application forms and related documents.

d. Public hearings on proposed operation permits. The applicant or any interested agency, person or group of persons may request or petition for a public hearing with respect to the proposed action. Any such request shall clearly state issues and topics to be addressed at the hearing. Any such request

or petition for public hearing must be filed with the department within the 30-day period prescribed in 42.1(9) “b” and shall indicate the interest of the party filing such request and the reasons why a hearing is warranted. The department shall hold an informal and noncontested case hearing if there is a significant public interest (including the filing of requests or petitions for such hearing) in holding such a hearing. Frivolous or insubstantial hearing requests may be denied by the department. Instances of doubt should be resolved in favor of holding the hearing. Any hearing held pursuant to this subrule shall be held in the geographical area of the system, or other appropriate area at the discretion of the department. The department may, as appropriate, consider related groups of permit applications at the hearing.

e. Public notice of public hearings.

(1) Public notice of any hearing held pursuant to 42.1(9) shall be circulated at least as widely as the notice under 42.1(9) “a” at least 30 days in advance of the hearing.

(2) The contents of the public notice of any hearing held pursuant to 42.1(9) shall include at least the following:

1. The name, address, and telephone number of the department;
2. The name and address of each applicant whose application will be considered at the hearing;
3. A brief reference to the public notice previously issued, including identification number and date of issuance;
4. Information regarding the time and location for the hearing;
5. The purpose of the hearing;
6. A concise statement of the issues raised by the person requesting the hearing;
7. The address and telephone number of the premises where interested persons may obtain further information, request a copy of the draft operation permit or modification prepared pursuant to 42.1(9), and inspect and copy the application forms and related documents; and
8. A brief description of the nature of the hearing, including the rules and procedures to be followed.

f. Decision by the department. The department shall issue or deny the operation permit within 30 days after the termination of the public hearing held pursuant to 42.1(9), or, if no public hearing is held, within 30 days after the termination of the period for requesting a hearing.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—42.2(455B) Lead consumer notice and public education for lead action level exceedance. All CWS and NTNC systems must comply with the lead consumer notice in accordance with 42.2(1). A CWS or NTNC system that exceeds the lead action level based on tap water samples collected in accordance with 567—paragraph 41.4(1) “c” must comply with the public education requirements in accordance with 42.2(2).

42.2(1) Lead consumer notice. All CWS and NTNC systems must provide a consumer notice of lead tap water monitoring results to persons served at the sites (taps) that are tested as listed in 567—42.2(455B). Any system exceeding the lead action level shall also implement the public education requirements of 42.2(2).

a. Reporting requirement. All CWS and NTNC systems must provide a notice of the individual tap results from lead tap water monitoring carried out under the requirements of 567—paragraph 41.4(1) “c” to the persons served by the water system at the specific sampling site from which the sample was taken (e.g., the occupants of the residence where the tap was tested).

b. Timing of notification. A water system must provide the consumer notice as soon as practical, but no later than 30 days after the system learns of the tap monitoring results.

c. Content of notice. The consumer notice must include the following:

- (1) Results of the lead tap water monitoring for the tap that was tested,
- (2) An explanation of the health effects of lead,
- (3) A list of steps consumers can take to reduce exposure to lead in drinking water,
- (4) Contact information for the water utility, and
- (5) The lead maximum contaminant level goal of 0 mg/L and the 90th percentile lead action level of 0.015 mg/L and the definitions for these two terms from rule 567—40.2(455B).

d. Delivery of notice. The consumer notice must be provided to persons served at the tap that was tested, either by mail or by another method approved by the department. For example, upon approval by the department, an NTNC system could post the results on a bulletin board in the facility to allow users to review the information. The system must provide the notice to customers at sample taps tested, including consumers who do not receive water bills.

e. Inclusion of copper results. The system may also include results of copper testing in the notice along with the 90th percentile copper action level of 1.3 mg/L, copper MCLG of 1.3 mg/L, and health effects language.

42.2(2) Lead public education for lead action level exceedance. A water system that exceeds the lead action level based on tap water samples collected in accordance with 567—paragraph 41.4(1) “c” shall deliver the public education materials contained in 42.2(2) “a” in accordance with 42.2(2) “b.” Water systems that exceed the lead action level must sample the tap water of any customer who requests it in accordance with 42.2(2) “c.”

a. Content of written public education materials. CWS and NTNC systems must include the following elements in printed materials (e.g., brochures and pamphlets) in the same order as listed in this paragraph. In addition, language in 42.2(2) “a” (1), (2), and (6) must be included in the materials exactly as written, except for the text in brackets in these paragraphs for which the water system must substitute system-specific information. Any additional information presented by a water system must be consistent with the information in 42.2(2) “a” and be in plain language that can be understood by the general public. Water systems must submit all written public education materials to the department prior to delivery. The department may require the system to obtain approval of the content of written public education materials prior to delivery.

(1) The following information must be included exactly as written. “IMPORTANT INFORMATION ABOUT LEAD IN YOUR DRINKING WATER. [*Insert name of water system*] found elevated levels of lead in drinking water in some homes/buildings. Lead can cause serious health problems, especially for pregnant women and young children. Please read this information closely to see what you can do to reduce lead in your drinking water.”

(2) The following information must be included exactly as written. “Health effects of lead. Lead can cause serious health problems if too much enters your body from drinking water or other sources. It can cause damage to the brain and kidneys, and can interfere with the production of red blood cells that carry oxygen to all parts of your body. The greatest risk of lead exposure is to infants, young children, and pregnant women. Scientists have linked the effects of lead on the brain with lowered IQ in children. Adults with kidney problems and high blood pressure can be affected by low levels of lead more than healthy adults. Lead is stored in the bones, and it can be released later in life. During pregnancy, the child receives lead from the mother’s bones, which may affect brain development.”

(3) Sources of lead. The printed materials must:

1. Explain what lead is.
2. Explain possible sources of lead in drinking water and how lead enters drinking water and include information on home/building plumbing materials and service lines that may contain lead.

3. Discuss other important sources of lead exposure in addition to drinking water (e.g., paint).

(4) Discuss the steps the consumers can take to reduce their exposure to lead in drinking water as follows:

1. Encourage running the water to flush out the lead.
2. Explain concerns with using hot water from the tap and specifically caution against the use of hot water for preparing baby formula.
3. Explain that boiling the water does not reduce lead levels.
4. Discuss other options consumers can take to reduce exposure to lead in drinking water, such as alternative sources or treatment of water.

5. Suggest that parents have their child’s blood tested for lead.

(5) The printed materials must explain why there are elevated levels of lead in the system’s drinking water (if known) and what the water system is doing to reduce the lead levels in homes/buildings in this area.

(6) The following information must be included exactly as written. “For more information, call us at [*insert your telephone number*] or visit our website at [*insert your website link here*]. For more information on reducing lead exposure around your home/building and the health effects of lead, visit EPA’s website at www.epa.gov/lead or contact your health care provider.”

(7) Community water systems must also include the following elements:

1. Tell consumers how to get their water tested.
2. Discuss lead in plumbing components and the difference between low lead and lead free.
- b. Delivery of public education materials.*

(1) Outreach to non-English speaking consumers. For public water systems serving a large proportion of non-English speaking consumers, as determined by the department, the public education materials must contain information in the appropriate language(s) regarding the importance of the notice or contain a telephone number or address where persons served may contact the water system to obtain a translated copy of the public education materials or to request assistance in the appropriate language.

(2) Delivery of public education at CWS. A CWS that exceeds the lead action level on the basis of tap water samples collected in accordance with 567—paragraph 41.4(1)“c” and that is not already conducting public education tasks under 42.2(2) must conduct the public education tasks within 60 days of the date of notification of the action level exceedance:

1. Deliver printed materials meeting the content requirements of 42.2(2)“a” to all bill-paying customers.

2. Contact customers who are most at risk by delivering education materials that meet the content requirements of 42.2(2)“a” to local public health agencies even if they are not located within the water system’s service area, along with an informational notice that encourages distribution to all the organization’s potentially affected customers or CWS’s users. The water system must contact the local public health agencies directly by phone or in person. The local public health agencies may provide a specific list of additional community-based organizations serving target populations, which may include organizations outside the service area of the water system. If such lists are provided, systems must deliver education materials that meet the content requirement of 42.2(2)“a” to all organizations on the provided lists.

3. Contact customers who are most at risk by delivering materials that meet the content requirements of 42.2(2)“a” to the following organizations that are located within the water system’s service area, along with an informational notice that encourages distribution to all the organization’s potentially affected customers or community public water supply system’s users:

- Public and private schools or school boards;
- Women, Infants, and Children (WIC) and Head Start programs;
- Public and private hospitals and medical clinics;
- Pediatricians;
- Family planning clinics; and
- Local welfare agencies.

4. Make a good-faith effort to locate the following organizations within the service area and to deliver to them materials that meet the content requirements of 42.2(2)“a,” along with an informational notice that encourages distribution to all potentially affected customers or users. The good-faith effort to contact at-risk customers may include requesting a specific contact list of these organizations from the local public health agencies, even if the agencies are not located within the water system’s service area:

- Licensed child care centers;
- Public and private preschools;
- Obstetricians, gynecologists, and midwives.

5. No less often than quarterly, provide information on or in each water bill as long as the system exceeds the action level for lead. The message on the water bill must include the following statement exactly as written except for the text in brackets for which the water system must substitute system-specific information: “[*insert name of water system*] found high levels of lead in drinking water in some homes. Lead can cause serious health problems. For more information, please call [*insert telephone number of water system*] or visit [*insert your website link here*].”

The message or delivery mechanisms can be modified in consultation with the department; specifically, the department may allow a separate mailing of public education materials to customers if the water system cannot place the information on water bills.

6. Post material meeting the content requirements of 42.2(2)“a” on the water system’s website if the system serves a population greater than 100,000.

7. Submit a press release to newspaper, television, and radio stations.

8. In addition to including those items previously listed, systems must implement at least three activities from one or more of the following categories. The educational content and selection of these activities must be determined in consultation with the department.

- Public service announcement;
- Paid advertisement;
- Public area information displays;
- Emails to customers;
- Public meetings;
- Household deliveries;
- Targeted individual customer contact;
- Direct material distribution to all multifamily homes and institutions; and
- Other methods approved by the department.

For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs, or if the department has established an alternate monitoring period, the last day of that period.

(3) Continuing public education at a CWS. As long as a CWS exceeds the action level, it must repeat the activities pursuant to 42.2(2)“b”(2) as follows:

1. A CWS shall repeat the tasks contained in 42.2(2)“b”(2)“1,” “2,” and “8” every 12 months.
2. A CWS shall repeat the tasks contained in 42.2(2)“b”(2)“5” with each billing cycle.
3. A CWS serving a population greater than 100,000 shall post and retain material on a publicly accessible website pursuant to 42.2(2)“b”(2)“6.”
4. A CWS shall repeat the task in 42.2(2)“b”(2)“7” twice every 12 months on a schedule agreed upon with the department. The department can allow activities in 42.2(2)“b”(2) to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the department in advance of the 60-day deadline, and the system must already have initiated public education activities prior to the end of the 60-day deadline.

(4) Delivery of public education at an NTNC system. Within 60 days of the date of notification of the action level exceedance, an NTNC system shall deliver the public education materials specified as follows:

1. Post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system; and
2. Distribute informational pamphlets or brochures on lead in drinking water to each person served by the nontransient noncommunity water system. The department may allow the system to utilize electronic transmission in lieu of or combined with printed materials as long as at least the same coverage is achieved. If the system serves children 18 years of age and under, such as a school or child care facility, the public education notice must be provided to the parents or legal guardians of the children.

For systems that are required to conduct monitoring annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs or, if the department has established an alternate monitoring period, the last day of that period.

(5) Continuing public education at an NTNC system. An NTNC system shall repeat the tasks contained in 42.2(2)“b”(4) at least once during each calendar year in which the system exceeds the lead action level. The department can allow activities in 42.2(2)“b”(4) to extend beyond the 60-day requirement if needed for implementation purposes on a case-by-case basis; however, this extension must be approved in writing by the department in advance of the 60-day deadline, and the system must already have initiated public education activities prior to the end of the 60-day deadline.

(6) Discontinuation of public education activities. A CWS or NTNC system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period conducted pursuant to 567—paragraph 41.4(1)“c.” Such system shall recommence public education in accordance with 42.2(2) if the system subsequently exceeds the lead action level during any monitoring period.

(7) Special population CWS allowance. A CWS that meets the following criteria may apply to the department in writing for reduced public education and notification requirements:

1. The CWS is a facility, such as a prison or hospital, where the population served is not capable of or is prevented from making improvements to plumbing or installing point-of-use treatment devices; and

2. The CWS provides water as part of the cost of services provided and does not separately charge for water consumption.

If the department approves the request in writing, the CWS is not required to include the language in 42.2(2)“a”(7) and must deliver the public education in accordance with 42.2(2)“b”(4) and (5), in lieu of 42.2(2)“b”(2) and (3).

(8) CWS serving 3,300 or fewer people. A CWS serving 3,300 or fewer people may limit certain aspects of its public education programs as follows:

1. The system must implement at least one of the activities listed in 42.2(2)“b”(2)“8.”

2. The system may limit the distribution of the public education materials in 42.2(2)“b”(2)“2” and “3” to facilities and organizations served by the system that are most likely to be visited regularly by pregnant women and children.

3. The department may waive the requirements of 42.2(2)“b”(2)“7” for the system provided the system distributes notices to every household served by the system.

c. Supplemental monitoring and notification of results. A water system that fails to meet the lead action level on the basis of tap samples collected in accordance with 567—paragraph 41.4(1)“c” shall offer to sample the tap water of any customer who requests it. The system is not required to pay for collecting or analyzing the sample, nor is the system itself required to collect and analyze the sample.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—42.3(455B) Consumer confidence reports.

42.3(1) Applicability and purpose. This rule applies to all community public water supply systems. The purpose of this rule is to establish the minimum requirements for the content of annual reports that community water systems must deliver to their customers. These reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants in the drinking water in an accurate and understandable manner. The department may assign public notification requirements and assess administrative penalties to any community public water supply system which fails to fulfill the requirements of this rule.

42.3(2) Reporting frequency.

a. Existing community water systems. Existing community water systems must deliver the first report by October 19, 1999; the second report by July 1, 2000; and subsequent reports annually by July 1 thereafter.

b. New community water systems. New community water systems must deliver their first report by July 1 of the year after their first full calendar year in operation, and annually thereafter.

c. A CWS which sells water to another CWS. A community water system that sells water to another community water system must deliver the applicable information required in subrule 42.3(3) to the buyer (or consecutive) system:

(1) No later than April 19, 1999, for the 1998 report; by April 1, 2000, for the 1999 report; and annually by April 1 thereafter, or

(2) On a date mutually agreed upon by the seller and the purchaser, and specifically included in a contract between the parties.

When a consecutive system sells water to another community water system, the seller must provide all applicable information in 42.3(3) to the CWS buying the water from them.

42.3(3) Content of the reports. Each annual consumer confidence report must contain the following information, at a minimum:

a. Source water identification. The report must identify the source(s) of water delivered by the community public water supply system, including the following:

(1) Type of water (e.g., surface water, groundwater, groundwater purchased from another public water supply).

(2) Commonly used name of the aquifer, reservoir, or river (if any) and location of the body (or bodies) of water.

(3) If a source water assessment has been completed, notify consumers of the availability of this information and the means to obtain it. In addition, systems are encouraged to highlight in the report significant sources of contamination in the source water area if they have readily available information. Where a system has received a source water assessment from the department, the report must include a brief summary of the system's susceptibility to potential sources of contamination, using language provided by the department or its designee, or written by the owner or operator.

b. Definitions. Each report using any of the following terms must include the applicable definitions:

(1) "Maximum Contaminant Level Goal (MCLG)" means the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

(2) "Maximum Contaminant Level (MCL)" means the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

(3) "Maximum Residual Disinfectant Level Goal (MRDLG)" means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

(4) "Maximum Residual Disinfectant Level (MRDL)" means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

(5) A report which contains data on a contaminant for which EPA has set a treatment technique or an action level must include one or both of the following definitions, as applicable:

1. "Treatment technique (TT)" means a required process intended to reduce the level of a contaminant in drinking water.

2. "Action level (AL)" means the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

(6) A report that contains information regarding a Level 1 or Level 2 assessment required under 567—subrule 41.2(1) must include the applicable definitions:

1. "Level 1 Assessment" is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

2. "Level 2 Assessment" is a very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred or why total coliform bacteria have been found in our water system on multiple occasions.

c. Information on detected contaminants. This paragraph specifies the requirements for information to be included in each report for contaminants subject to mandatory monitoring (except *Cryptosporidium*, which is listed in 42.3(3)"c"(2)) as follows: contaminants subject to an MCL, action level, MRDL, or treatment technique (regulated contaminants); contaminants for which monitoring is required by CFR Title 40, Part 141.40 (unregulated contaminants), 567—subrule 41.11(1) (sodium monitoring), and 567—41.15(455B) (other contaminants); and disinfection byproducts or microbial contaminants for which monitoring is required by 567—Chapters 40 to 43, except as provided under 42.3(3)"e"(1), and which are detected in the finished water. The ammonia monitoring conducted pursuant to 567—subrule 41.11(2) is not subject to this paragraph. For the purposes of this subrule, "detected" means at or above the levels prescribed by the following: inorganic

contaminants in 567—subparagraph 41.3(1)“e”(1); volatile organic contaminants in 567—paragraph 41.5(1)“b”; synthetic organic contaminants in 567—paragraph 41.5(1)“b”; radionuclide contaminants in 567—paragraph 41.8(1)“c”; disinfection byproducts in 567—paragraph 83.6(7)“a”(6)“3”; and other contaminants with health advisory levels, as assigned by the department.

(1) The data relating to these contaminants must be displayed in one table or in several adjacent tables. Any additional monitoring results which a community water system chooses to include in its report must be displayed separately.

1. The data must be derived from data collected to comply with departmental monitoring and analytical requirements during calendar year 1998 for the first report and subsequent calendar years thereafter. Where a system is allowed to monitor for contaminants less often than once a year, the table(s) must include the results and date of the most recent sampling and a brief statement indicating that the data presented in the report are from the most recent testing done in accordance with the regulations. No data older than five years need be included.

2. For detected regulated contaminants, which are listed in Appendix C, the table(s) must contain:

- The MCL for that contaminant, expressed as a number equal to or greater than 1.0 (as provided in Appendix C);

- The MCLG for that contaminant, expressed in the same units as the MCL;

- If there is no MCL for a detected contaminant, the table must indicate that there is a treatment technique, or specify the action level, applicable to that contaminant, and the report must include the definition for treatment technique or action level, as appropriate, specified in 42.3(3)“b”(4).

3. For contaminants subject to an MCL, except turbidity and total coliforms, the table must contain the highest contaminant level used to determine compliance with a primary drinking water standard and the range of detected levels, as follows:

- When compliance with the MCL is determined annually or less frequently: the highest detected level at any sampling point and the range of detected levels expressed in the same units as the MCL (such as inorganic compounds).

- When compliance with the MCL is determined by calculating a running annual average of all samples taken at a sampling point: the highest average of any of the sampling points and the range of all sampling points expressed in the same units as the MCL (such as organic compounds and radionuclides). For TTHM and HAA5 MCLs, systems must include the highest locational running annual average for TTHM and HAA5 and the range of individual sample results for all monitoring locations expressed in the same units as the MCL. If more than one location exceeds the TTHM or HAA5 MCL, the system must include the locational running annual averages for all locations that exceed the MCL.

- When compliance with an MCL is determined on a systemwide basis by calculating a running annual average of all samples at all sampling points: the average and range of detection expressed in the same units as the MCL.

NOTE: When rounding of results to determine compliance with the MCL is allowed by the regulations, rounding should be done prior to multiplying the results by the factor listed in Appendix C.

4. For turbidity: When it is reported pursuant to 567—43.5(455B), 567—43.9(455B), or 567—43.10(455B): the highest single measurement and the lowest monthly percentage of samples meeting the turbidity limits specified in 567—43.5(455B), 567—43.9(455B), or 567—43.10(455B) for the filtration technology being used. The report should include an explanation of the reasons for measuring turbidity.

5. For lead and copper: the 90th percentile value of the most recent round of sampling and the number of sampling sites exceeding the action level.

6. Rescinded IAB 4/11/18, effective 5/16/18.

7. For *E. coli* analytical results under 567—subrule 41.2(1), the total number of positive samples.

8. The likely source(s) of detected contaminants to the best of the owner’s or operator’s knowledge. Specific information regarding contaminants may be available in sanitary surveys and source water assessments, and should be used when available to the owner or operator. If the owner or operator lacks specific information on the likely contaminant source, the report must include one or

more of the typical sources for that contaminant listed in Appendix C, which are most applicable to the system.

9. If a community water system distributes water to its customers from multiple hydraulically independent distribution systems that are fed by different raw water sources, the table should contain a separate column for each service area and the report should identify each separate distribution system. Alternatively, systems may produce separate reports tailored to include data for each service area.

10. The table(s) must clearly identify any data indicating MCL, MRDL, or TT violations, and the report must contain a clear and readily understandable explanation of the violation including:

- The length of the violation,
- The potential adverse health effects,
- Actions taken by the system to address the violation, and
- The relevant language from Appendix C to describe the potential health effects.

11. For detected unregulated contaminants for which monitoring is required, except *Cryptosporidium*, the table(s) must contain the average and range at which the contaminant was detected. The report may include a brief explanation of the reasons for monitoring for unregulated contaminants.

12. Community public water supply systems may list the most recent results of the special sodium monitoring requirement according to 567—subrule 41.11(1) in the annual report, instead of providing a separate public notification.

13. If a contaminant which does not have an MCL, MRDL, TT, or AL is detected in the water, the PWS must contact the department for the specific health effects language, health advisory level, and contamination sources.

(2) If monitoring indicates that *Cryptosporidium* may be present in the source water or the finished water, or that radon may be present in the finished water, the report must include:

1. A summary of the *Cryptosporidium* monitoring results;
2. The radon monitoring results; and
3. An explanation of the significance of the results.

(3) If the system has performed additional monitoring which indicates the presence of other contaminants in the finished water, the system must report any results which may indicate a health concern. To determine if results may indicate a health concern, the community public water supply can determine if there is a current or proposed maximum contaminant level, maximum residual disinfectant level, treatment technique, action level, or health advisory by contacting the department or by calling the national Safe Drinking Water Hotline ((800)426-4791). The department considers the detection of a contaminant above a proposed MCL or health advisory to indicate possible health concerns. For such contaminants, the report should include:

1. The results of the monitoring; and
2. An explanation of the significance of the results noting the existence of a health advisory or a proposed regulation.

(4) If the system was required to comply with the federal Information Collection Rule pursuant to the Code of Federal Regulations Title 40 Part 141, it must include the results of monitoring in compliance with Sections 141.142 and 141.143. These results need only be included for five years from the date of the sample or until any of the detected contaminants become regulated and subject to routine monitoring requirements, whichever comes first.

d. Compliance with 567—Chapters 40, 41, 42, and 43. In addition to the requirements of paragraph 42.3(3)“c”(1)“9,” the report must note any violation that occurred during the year covered by the report of a requirement listed below and include a clear and readily understandable explanation of the violation, any potential adverse health effects, and the steps the system has taken to correct the violation. Note any violation of the following requirements:

(1) Monitoring and reporting of compliance data pursuant to 567—Chapters 41 and 43, which includes any contaminant with a maximum contaminant level, treatment technique, action level, or health advisory;

(2) Treatment techniques:

1. Filtration and disinfection prescribed by 567—43.5(455B). For systems which have failed to install adequate filtration or disinfection equipment or processes, or have had a failure of such equipment or processes which constitutes a violation, the report must include the following language as part of the explanation of potential adverse health effects: Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

2. Lead and copper control requirements. For systems which fail to take one or more actions prescribed by 567—Chapters 41 to 43 pertaining to lead and copper, the report must include the applicable language of Appendix C to this chapter for lead or copper, or both.

3. Acrylamide and epichlorohydrin control technologies prescribed by 567—subparagraph 41.5(1) “b”(3). For systems which violate the requirements of 567—subparagraph 41.5(1) “b”(3), the report must include the relevant language from Appendix C to this chapter.

(3) Record keeping of compliance data pursuant to 567—Chapters 40 to 43;

(4) Special monitoring requirements; and

(5) Violation of the terms of operation permit compliance schedule, or an administrative order or judicial order.

e. Operation permit or administrative order with a schedule which extends the time period in which compliance must be achieved. If a system has been issued a compliance schedule with an extension for compliance, the report must contain:

(1) An explanation of the reasons for the extension;

(2) The date on which the extension was issued;

(3) A brief status report on the steps the system is taking to install treatment, find alternative sources of water, or otherwise comply with the terms of the compliance schedule; and

(4) A notice of any opportunity for public input in the review or renewal of the compliance schedule.

f. Mandatory report language for explanation of contaminant occurrence. The reports must contain a brief explanation regarding contaminants which may reasonably be expected to be found in drinking water including bottled water. This explanation may include the language of the following subparagraphs (1) to (3). Subparagraph (4) is provided as a minimal alternative to subparagraphs (1) to (3). Systems may also develop their own comparable language. The report also must include the language of 42.3(3) “g.”

(1) The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

(2) Contaminants that may be present in source water include:

1. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

2. Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

3. Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water runoff, and residential uses.

4. Organic chemical contaminants, including synthetic and volatile organics, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.

5. Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

(3) In order to ensure that tap water is safe to drink, the department prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The United States Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

(4) Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the national Safe Drinking Water Hotline ((800)426-4791).

g. Required additional health information.

(1) All systems. All reports must prominently display the following language: Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the national Safe Drinking Water Hotline ((800)426-4791).

(2) Arsenic levels greater than 0.005 mg/L.

1. A system which detects arsenic at levels above 0.005 mg/L and less than or equal to 0.010 mg/L:

- Must include in its report a short information statement about arsenic, using language such as: While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

- May write its own educational statement, but only in consultation with the department.

2. A community water system that detects arsenic above 0.010 mg/L and less than or equal to 0.05 mg/L must include the arsenic health effects language prescribed by Appendix C to this chapter.

(3) Nitrate levels greater than half the MCL (5.0 mg/L). A system which detects nitrate at levels above 5.0 mg/L, but below the MCL:

1. Must include a short informational statement about the impacts of nitrate on children using language such as: Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health care provider.

2. May write its own education statement, but only in consultation with the department.

(4) Nitrite levels greater than half the MCL (0.50 mg/L). A system which detects nitrite at levels above 0.50 mg/L, but below the MCL:

1. Must include a short informational statement about the impacts of nitrite on children using language such as: Nitrite in drinking water at levels above 1 ppm is a health risk for infants of less than six months of age. High nitrite levels in drinking water can cause blue baby syndrome. If you are caring for an infant you should ask advice from your health care provider.

2. May write its own education statement, but only in consultation with the department.

(5) Lead information statement for all CWS. Every report must include the following lead-specific information:

1. A short informational statement about lead in drinking water and the effects it has on children. The statement must include the following information:

"If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from material and components associated with service lines and home plumbing. [insert name of system] is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water,

testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800)426-4791 or at www.epa.gov/safewater/lead.”

2. A system may write its own educational statement, but only in consultation with the department.

(6) Total trihalomethane (TTHM) levels above 0.080 mg/L but less than the MCL. Community water systems that detect TTHM above 0.080 mg/L, but below the MCL in 567—subrule 41.5(1), as an annual average, monitored and calculated under the provisions of 567—paragraph 41.5(1) “e,” must include the health effects language for total trihalomethanes listed in Appendix C.

h. Additional mandatory report requirements.

(1) The report must include the telephone number of the owner, operator, or designee of the community water system as a source of additional information concerning the report.

(2) In communities with a large proportion of non-English speaking residents, as determined by the department, the report must contain information in the appropriate language(s) regarding the importance of the report or contain a telephone number or address where such residents may contact the system to obtain a translated copy of the report or assistance in the appropriate language.

(3) The report must include information (e.g., time and place of regularly scheduled board meetings) about opportunities for public participation in decisions that may affect the quality of the water.

(4) The systems may include such additional information as they deem necessary for the public education consistent with, and not detracting from, the purpose of the report.

(5) Systems required to comply with 567—41.7(455B), the groundwater rule, must include the following when applicable:

1. Any groundwater system that receives notice from the department of a significant deficiency must inform its customers of any significant deficiency that is uncorrected at the time of the next report. The system must continue to inform the public annually until the department determines that particular significant deficiency is corrected. Each report must include the following elements:

- The nature of the particular significant deficiency and the date the significant deficiency was identified by the department; and
- For each significant deficiency, the department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed.

Only if directed by the department, a system with significant deficiencies that have been corrected before the next report is issued must inform its customers of the significant deficiency, how the deficiency was corrected, and the date of correction.

2. Any groundwater system that receives notice from the department or laboratory of a fecal indicator-positive groundwater source sample that is not invalidated by the department under 567—paragraph 41.7(3) “d” must inform its customers of any fecal indicator-positive groundwater source sample in the next report. The system must continue to inform the public annually until the department determines that the fecal contamination in the groundwater source is addressed under 567—paragraph 41.7(4) “a.” Each report must include the following elements:

- The source of the fecal contamination (if the source is known) and the dates of the fecal indicator-positive groundwater source samples;
- Whether the fecal contamination in the groundwater source has been addressed under 567—paragraph 41.7(4) “a” and the date of such action;
- For each fecal contamination in the groundwater source that has not been addressed under 567—paragraph 41.7(4) “a,” the department-approved plan and schedule for correction, including interim measures, progress to date, and any interim measures completed; and
- If the system receives notice of a fecal indicator-positive groundwater source sample that is not invalidated by the department under 567—paragraph 41.7(3) “d,” the potential health effects, using the “Fecal coliform or *E. coli*” or “Fecal Indicators (enterococci or coliphage)” health effects language of Appendix C in Chapter 42.

(6) Pursuant to 567—subrule 41.2(1), any system required to comply with the Level 1 assessment requirement or a Level 2 assessment requirement that is not due to an *E. coli* MCL violation must include

in the report the text in 42.3(3) “h”(6)“1” to “3” as appropriate, filling in the blanks accordingly and including the text found in the bulleted paragraphs of 42.3(3) “h”(6)“4” if appropriate.

1. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that the potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

2. During the past year, we were required to conduct [insert number of required Level 1 assessments] Level 1 assessment(s). [insert number of completed Level 1 assessments] Level 1 assessment(s) were completed. In addition, we were required to take [insert number of required corrective actions] corrective actions, and we completed [insert number of completed corrective actions] of these actions.

3. During the past year, [insert number of required Level 2 assessments] Level 2 assessments were required to be completed for our water system. [insert number of completed Level 2 assessments] Level 2 assessment(s) were completed. In addition, we were required to take [insert number of required corrective actions] corrective actions, and we completed [insert number of completed corrective actions] of these actions.

4. Any system that has failed to complete all the required assessments or correct all identified sanitary defects is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

- During the past year, we failed to conduct all of the required assessment(s).
- During the past year, we failed to correct all identified defects that were found during the assessment.

(7) Pursuant to 567—subrule 41.2(1), any system required to conduct a Level 2 assessment due to an *E. coli* MCL violation must include in the report the text in 42.3(3) “h”(7)“1” and “2” as appropriate, filling in the blanks accordingly and including the text found in the bulleted paragraphs of 42.3(3) “h”(7)“3” if appropriate.

1. *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

2. We were required to complete a Level 2 assessment because we found *E. coli* bacteria in our water system. In addition, we were required to take [insert number of required corrective actions] corrective actions, and we completed [insert number of completed corrective actions] of these actions.

3. Any system that has failed to complete the required assessment or correct all identified sanitary defects is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

- We failed to conduct the required assessment.
- We failed to correct all sanitary defects that were identified during the assessment that we conducted.

(8) Pursuant to 567—subrule 41.2(1), if a system detects *E. coli* and violated the *E. coli* MCL, in addition to completing the table as required in 42.3(3) “c,” the system must include one or more of the following statements to describe any noncompliance, as applicable:

1. We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.
2. We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.
3. We failed to take all required repeat samples following an *E. coli*-positive routine sample.
4. We failed to test for *E. coli* when any repeat sample tested positive for total coliform.

(9) Pursuant to 567—subrule 41.2(1), if a system detects *E. coli* and has not violated the *E. coli* MCL, in addition to completing the table as required in 42.3(3)“c,” the system may include a statement that explains that although the system has detected *E. coli*, the system is not in violation of the *E. coli* MCL.

42.3(4) Report delivery.

a. Required report recipients. Each community water system must mail or otherwise directly deliver one copy of the report to each customer.

(1) The system must make a good-faith effort to reach consumers who do not get water bills, using means recommended by the department. An adequate good-faith effort will be tailored to the consumers who are served by the system but are not bill-paying customers, such as renters or workers. A good-faith effort to reach consumers would include a mix of methods appropriate to the particular system such as:

1. Posting the reports on the Internet;
2. Mailing to postal patrons in metropolitan areas;
3. Advertising the availability of the report in the news media;
4. Publication in a local newspaper;
5. Posting in public places such as cafeterias or lunchrooms of public buildings;
6. Delivery of multiple copies for distribution by single-billed customers such as apartment buildings or large private employers;
7. Delivery to community organizations.

(2) No later than the date the system is required to distribute the report to its customers, each community water system must mail a copy of the report to the department, followed within three months by a certification that the report has been distributed to customers, and that the information is correct and consistent with the compliance monitoring data previously submitted to the department.

(3) No later than the date the system is required to distribute the report to its customers, each community water system must deliver the report to any other agency or clearinghouse identified by the department, such as the Iowa department of public health or county board of health.

b. Availability of report. Each community water system must make its report available to the public upon request. Each community water system serving 100,000 or more persons must post its current year’s report to a publicly accessible site on the Internet.

c. Waiver from mailing requirements for systems serving fewer than 10,000 persons. All community public water supply systems with fewer than 10,000 persons served will be granted the waiver, except for those systems which have the following: one or more exceedances of a maximum contaminant level, treatment technique, action level, or health advisory; an administrative order; a court order; significant noncompliance with monitoring or reporting requirements; or an extended compliance schedule contained in the operation permit. Even though a public water supply system has been granted a mailing waiver, subparagraphs 42.3(4)“a”(2) and (3) and paragraph 42.3(4)“b” still apply to all community public water supply systems. A mailing waiver is not allowed for the report covering the year during which one of the previously listed exceptions occurred. Systems which use the mailing waiver must:

(1) Publish the reports in one or more local newspapers serving the area in which the system is located;

(2) Inform the customers that the reports will not be mailed, either in the newspapers in which the reports are published or by other means approved by the department; and

(3) Make the reports available to the public upon request.

d. Waiver from mailing requirements for systems serving 500 or fewer in population. All community public water supply systems serving 500 or fewer persons will be granted the waiver, except for those systems which have the following: one or more exceedances of a maximum contaminant level, treatment technique, action level, or health advisory; an administrative order; a court order; significant noncompliance with monitoring or reporting requirements; or an extended compliance schedule contained in the operation permit. Systems serving 500 or fewer persons which use the waiver may forego the requirements of subparagraphs 42.3(4)“c”(1) and (2) if they provide notice at least once per year to their customers by mail, door-to-door delivery, or by posting that the report is available upon

request, in conspicuous places within the area served by the system acceptable to the department. A mailing waiver is not allowed for the report covering the year during which one of the previously listed exceptions occurred. Even though a public water supply system has been granted a mailing waiver, subparagraphs 42.3(4)“a”(2) and (3) and paragraph 42.3(4)“b” still apply to all community public water supply systems.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—42.4(455B) Reporting.

42.4(1) Reporting requirements other than for lead and copper.

a. When required by the department, the supplier of water shall report to the department within ten days following a test, measurement or analysis required to be made by 567—Chapter 40, 41, 42, or 43 the results of that test, measurement or analysis in the form and manner prescribed by the department. This shall include reporting of all positive detects within the same specific analytical method.

b. Except where a different reporting period is specified in this rule or 567—Chapters 41 and 43, the supplier of water shall report to the department within 48 hours after any failure to comply with the monitoring requirements set forth in 567—Chapters 41 and 43. The supplier of water shall also notify the department within 48 hours of failure to comply with any primary drinking water regulations.

c. The public water supply system, within ten days of completion of each public notification required pursuant to 567—42.1(455B) for the initial public notice and any repeat notices, shall submit to the department a certification that it has fully complied with the public notification rules. The public water system must include with this certification a representative copy of each type of notice distributed, published, posted, or made available to the persons served by the system or to the media.

d. Groundwater rule. Additional reporting requirements for the groundwater rule are listed in 567—paragraph 41.7(6)“a.”

e. Coliform rule. Additional reporting requirements for the coliform rule are listed in 567—paragraph 41.2(1)“n.”

42.4(2) Lead and copper reporting requirements. All water systems shall report all of the following information to the department in accordance with this subrule.

a. *Reporting requirements for tap water monitoring for lead and copper and for water quality parameter monitoring.*

(1) Except as provided in 42.4(2)“a”(1)“8,” a water system shall report the information specified below for all tap water samples specified in 567—paragraph 41.4(1)“c” and for all water quality parameter samples specified in 567—paragraph 41.4(1)“d” within the first ten days following the end of each applicable monitoring period specified in 567—41.4(455B) (i.e., every six months, annually, or every three years). For monitoring periods with a duration of less than six months, the end of the monitoring period is the last date samples can be collected during that period as specified in 567—paragraphs 41.4(1)“c” and 41.4(1)“d.”

1. The results of all tap samples for lead and copper including the location of each site and the criteria under which the site was selected for the system’s sampling pool;

2. Documentation for each tap water lead or copper sample for which the water system requests invalidation pursuant to 567—paragraph 41.4(1)“c”(6)“2”;

3. Rescinded IAB 1/7/04, effective 2/11/04;

4. The 90th percentile lead and copper concentrations measured from among all lead and copper tap water samples collected during each monitoring period (calculated in accordance with 567—subparagraph 41.4(1)“b”(3));

5. With the exception of initial tap sampling conducted pursuant to 567—paragraph 41.4(1)“c”(4)“1,” the system shall designate any site which was not sampled during previous monitoring periods, and include an explanation of why sampling sites have changed;

6. The results of all tap samples for pH and, where applicable, alkalinity, calcium, conductivity, temperature, and orthophosphate or silica collected under 567—subparagraphs 41.4(1)“d”(2) through (5);

7. The results of all samples collected at the entry point(s) to the distribution system for applicable water quality parameters under 567—subparagraphs 41.4(1)“d”(2) and (5); and

8. A water system shall report the results of all water quality parameter samples collected under 567—subparagraphs 41.4(1)“d”(3) through (6) during each six-month monitoring period specified in 567—subparagraph 41.4(1)“d”(4) within the first ten days following the end of the monitoring period, unless the department has specified a more frequent reporting requirement.

(2) Certain systems that do not have enough taps that can provide first-draw samples that have met the six-hour stand time criteria, such as an NTNC that has 24-hour operation or a CWS that meets the criteria of 42.2(2)“b”(7), must either:

1. In the case where the department has not approved the non-first-draw sample sites, provide written documentation to the department identifying stand times and locations for enough non-first-draw samples to make up its sampling pool under 567—paragraph 41.4(1)“c”(2)“5” by July 1, 2003; or

2. If the department has already approved the non-first-draw sample sites selected by the system, identify each site that did not meet the six-hour minimum stand time and the length of stand time for that particular substitute sample collected pursuant to 567—paragraph 41.4(1)“c”(2)“5.” Certain systems include this information in writing with the lead and copper tap sample results required to be submitted pursuant to 567—paragraph 41.4(1)“d”(1)“1.”

(3) At a time specified by the department or, if no specific time is designated by the department, then as early as possible prior to the addition of a new source or any long-term change in water treatment, a water system that has optimized corrosion control under 567—subparagraph 43.7(1)“b”(3), a water system subject to reduced monitoring pursuant to 567—paragraph 41.4(1)“c”(4)“4,” or a water system subject to a monitoring waiver pursuant to 567—subparagraph 41.4(1)“c”(7) shall send written documentation to the department describing the change or addition. The department must review and approve the addition of a new source or long-term change in treatment before it is implemented by the water system. Examples of long-term treatment changes include the addition of a new treatment process or modification of an existing treatment process. Examples of modifications include the switching of secondary disinfectants, switching of coagulants (e.g., alum to ferric chloride), and switching of corrosion inhibitor products (e.g., orthophosphate to blended phosphate). Long-term changes can include dose changes to existing chemicals if the system is planning long-term changes to its finished water pH or residual inhibitor concentration. Long-term treatment changes would not include chemical dose fluctuations associated with daily water quality changes. In those instances where prior department approval of the treatment change or new source is not required, water systems are encouraged to provide the notification to the department beforehand to minimize the risk that the treatment change or new source will adversely affect optimal corrosion control.

(4) Any small system applying for a monitoring waiver under 567—subparagraph 41.4(1)“c”(7), or subject to a waiver granted pursuant to 567—paragraph 41.4(1)“c”(7)“3,” shall provide the following information to the department in writing by the specified deadline:

1. By the start of the first applicable monitoring period in 567—subparagraph 41.4(1)“c”(4), any small water system applying for a monitoring waiver shall provide the documentation required to demonstrate that it meets the waiver criteria of 567—paragraphs 41.4(1)“c”(7)“1” and “2.”

2. No later than nine years after the monitoring previously conducted pursuant to 567—paragraph 41.4(1)“c”(7)“2” or 567—paragraph 41.4(1)“c”(7)“4,” first bulleted paragraph, each small system desiring to maintain its monitoring waiver shall provide the information required by 567—paragraph 41.4(1)“c”(7)“4,” first and second bulleted paragraphs.

3. No later than 60 days after the system becomes aware that it is no longer free of lead-containing or copper-containing materials, as appropriate, each small system with a monitoring waiver shall provide written notification to the department, setting forth the circumstances resulting in the lead-containing or copper-containing materials being introduced into the system and what corrective action, if any, the system plans to remove these materials.

(5) Each groundwater system that limits water quality parameter monitoring to a subset of entry points under 567—paragraph 41.4(1)“d”(3)“3” shall provide, by the commencement of such monitoring, written correspondence to the department that identifies the selected entry points and

includes information sufficient to demonstrate that the sites are representative of water quality and treatment conditions throughout the system.

b. Source water monitoring reporting requirements.

(1) A water system shall report the sampling results for all source water samples collected in accordance with 567—paragraph 41.4(1)“e” within the first ten days following the end of each source water monitoring period (i.e., annually, per compliance period or per compliance cycle) specified in 567—paragraph 41.4(1)“e.”

(2) With the exception of the first round of source water sampling conducted pursuant to 567—subparagraph 41.4(1)“e”(2), the system shall specify any site which was not sampled during previous monitoring periods, and include an explanation of why the sampling point has changed.

c. Corrosion control treatment reporting requirements. By the applicable dates under 567—subrule 43.7(1), systems shall report the following information:

(1) For systems demonstrating that they have already optimized corrosion control, information required in 567—subparagraph 43.7(1)“b”(2) or (3).

(2) For systems required to optimize corrosion control, their recommendation regarding optimal corrosion control treatment under 567—paragraph 43.7(2)“a.”

(3) For systems required to evaluate the effectiveness of corrosion control treatments under 567—paragraph 43.7(2)“c,” the information required by that paragraph.

(4) For systems required to install optimal corrosion control designated by the department under 567—paragraph 43.7(2)“d,” a letter certifying that the system has completed installing that treatment.

d. Source water treatment reporting requirements. By the applicable dates in 567—subparagraph 43.7(3)“b”(1), systems shall provide the following information to the department:

(1) If required under 567—subparagraph 43.7(3)“b”(1), their recommendation regarding source water treatment;

(2) For systems required to install source water treatment under 567—subparagraph 43.7(3)“b”(1), a letter certifying that the system has completed installing the treatment designated by this department within 24 months after the department designated the treatment.

e. Lead service line replacement reporting requirements. Systems shall report the following information to demonstrate compliance with the requirements of 567—subrule 43.7(4):

(1) No later than 12 months after the end of a monitoring period in which a system exceeds the lead action level in sampling referred to in 567—paragraph 43.7(4)“a,” the system must submit to the department written documentation of the material evaluation pursuant to 567—subparagraph 41.4(1)“c”(1), identify the initial number of lead service lines in its distribution system at the time the system exceeds the lead action level, and provide the department with the system’s schedule for replacing annually at least 7 percent of the initial number of lead service lines in its distribution system.

(2) No later than 12 months after the end of a monitoring period in which a system exceeds the lead action level in sampling referred to in 567—paragraph 43.7(4)“a” and every 12 months thereafter, the system shall demonstrate in writing that the system has either:

1. Replaced in the previous 12 months at least 7 percent of the initial lead service lines (or a greater number of lines specified by the department under 567—paragraph 43.7(4)“e” in its distribution system), or

2. Conducted sampling which demonstrates that the lead concentration in all service line samples from individual line(s), taken pursuant to 567—paragraph 41.4(1)“c”(2)“3,” is less than or equal to 0.015 mg/L. In such cases, the total number of lines replaced and those lines which meet the criteria in 567—paragraph 43.7(4)“c” shall equal at least 7 percent of the initial number of lead lines identified under 42.4(2)“e”(1) or the percentage specified by the department under 567—paragraph 43.7(4)“e.” A lead service line meeting the criteria of 567—paragraph 43.7(4)“c” may only be used to comply with the 7 percent criteria for a specific year, and may not be used again to calculate compliance with the 7 percent criteria in future years.

(3) The annual letter submitted to the department under 42.4(2)“e”(2) shall contain the following information:

1. The number of lead service lines scheduled to be replaced during the previous year of the system's replacement schedule;

2. The number and location of each lead service line replaced during the previous year of the system's replacement schedule;

3. If measured, the water lead concentration and location of each lead service line sampled, the sampling method, and the date of sampling.

(4) Any system which collects lead service line samples following partial lead service line replacement required by 567—subrule 43.7(4) shall report the results to the department within the first ten days of the month following the month in which the system receives the laboratory results, or as specified by the department. Systems shall also report any additional information as specified by the department, and in a time and manner prescribed by the department, to verify that all partial lead service line replacement activities have taken place.

f. Public education program reporting requirements.

(1) Any water system that is subject to the public education requirements in 42.2(2) shall, within ten days after the end of each period in which the system is required to perform public education in accordance with 42.2(2) "b," send written documentation to the department that contains:

1. A demonstration that the system has delivered the public education materials that meet the content requirements in 42.2(2) "a" and the delivery requirements in 42.2(2) "b"; and

2. A list of all the newspapers, radio stations, television stations, facilities and organizations to which the system delivered public education materials during the period in which the system was required to perform public education tasks.

(2) Unless required by the department, a system that previously has submitted the information required by 42.4(2) "f"(1) "2" need not resubmit the same information, provided there have been no changes in the distribution list and the system certifies that the public education materials were distributed to the same list previously submitted. The certification is due within ten days after the end of each period in which the system is required to perform public education.

(3) No later than three months following the end of the monitoring period, each system must mail a sample copy of the consumer notification of tap results to the department along with a certification that the notification has been distributed in a manner consistent with the requirements of 42.2(1).

g. Reporting of additional monitoring data. A system which collects sampling data in addition to that required by 567—Chapters 41 and 43 shall report the results to the department within the first ten days following the end of the applicable monitoring period under 567—paragraphs 41.4(1) "c," "d," and "e" during which the samples are collected.

42.4(3) Operation and maintenance for PWS.

a. Required records of operation.

(1) Applicability. Monthly records of operation shall be completed by all public water supplies, on forms provided by the department or on similar forms, unless a public water supply meets all of the following conditions:

1. Supplies an annual average of not more than 25,000 gpd or serves no more than an average of 250 individuals daily;

2. Is a community public water supply and does not provide any type of treatment, or is a noncommunity system (NTNC and TNC) which has only a cation-exchange softening or iron/manganese removal treatment unit, and meets the requirements of 42.4(3) "a"(2) "7";

3. Does not utilize either a surface water or a groundwater under the direct influence of surface water either in whole or in part as a water source;

4. Does not use a treatment technique such as blending to achieve compliance with a maximum contaminant level, treatment technique, action level, or health advisory.

The reports shall be completed as described in 42.4(3) "a"(2) and maintained at the facility for inspection by the department for a period of five years. For CWS and NTNC PWSs, the monthly operation report must be signed by the certified operator in charge. For TNC PWSs, the monthly operation report, if required by the department, must be signed by the owner or the owner's designee.

All public water supplies using a surface water or influenced groundwater source must also comply with the applicable record-keeping requirements in 567—43.5(455B), 567—43.9(455B), 567—43.10(455B), and 567—43.11(455B).

(2) Contents. Monthly operation reports shall be completed as follows:

1. Pumpage or flow. Noncommunity supplies shall measure and record the total water used each week. It is recommended that a daily measurement and recording be made. Community supplies shall measure and record daily water used. Reporting of pumpage or flow may be required in an operation permit where needed to verify MCL compliance.

2. Treatment effectiveness. Where treatment is practiced, the intended effect of the treatment shall be measured at locations and by methods which best indicate effectiveness of the treatment process. These measurements shall be made pursuant to Appendix B of this chapter. Daily monitoring is seven days a week unless otherwise specified by the department.

3. Treatment effectiveness for a primary standard. Where the raw water quality does not meet the requirements of 567—Chapters 41 and 43 and treatment is practiced for the purpose of complying with a maximum contaminant level, action level, health advisory, or treatment technique criteria, daily measurement of the primary standard constituent or an appropriate indicator constituent designated by the department shall be recorded. The department will require reporting of these results in the operation permit to verify MCL compliance.

4. Treatment effectiveness for a secondary standard. Where treatment is practiced for the purpose of achieving the recommended level of any constituent designated in the federal secondary standards, measurements shall be measured and recorded at a frequency specified in Appendix B. Daily monitoring is seven days a week unless otherwise specified by the department.

5. Chemical application. Chemicals such as fluoride, iodine, bromine and chlorine, which are potentially toxic in excessive concentration, shall be measured and recorded daily. Recording shall include the amount of chemical applied each day. Where the supplier of water is attempting to maintain a residual of the chemical throughout the system, such as chlorine, the residual in the system shall be recorded daily. The quantity of all other chemicals applied shall be measured and recorded at least once each week.

6. Static water levels and pumping water levels must be measured and recorded once per month for all groundwater sources. More or less frequent measurements may be approved by the department where historical data justifies it.

7. Noncommunity systems (NTNC and TNC) are exempt from the self-monitoring requirements for cation-exchange softening and iron/manganese removal if the treatment unit:

- Is a commercially available “off-the-shelf” unit designed for home use;
- Is self-contained, requiring only a piping connection for installation;
- Operates throughout a range of 35 to 80 psi; and
- Has not been installed for the purpose of removing a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory.

b. Chemical quality and application. Any drinking water system chemical which is added to raw, partially treated, or finished water must be suitable for the intended use in a potable water system. Effective on October 1, 2000, the chemical must be certified by an American National Standards Institute (ANSI) accredited third party for conformance with American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60, if such certification exists for the particular product, unless certified chemicals are not reasonably available for use, in accordance with guidelines provided by the department. If the chemical is not certified to meet the ANSI/NSF Standard 60 or no certification is available, the person seeking to supply or use the chemical must prove to the satisfaction of the department that the chemical is not toxic or otherwise a potential hazard in a potable public water supply system.

The supplier of water shall keep a record of all chemicals used. This record should include a clear identification of the chemical by brand or generic name and the dosage rate. When chemical treatment is applied with the intent of obtaining an in-system residual, the residuals will be monitored regularly.

When chemical treatment is applied and in-system residuals are not expected, the effectiveness of the treatment will be monitored through an appropriate indicative parameter.

(1) Continuous disinfection.

1. When required. Continuous disinfection must be provided at all public water supply systems, except for the following: groundwater supplies that have no treatment facilities or have only fluoride, sodium hydroxide or soda ash addition and that meet the bacterial standards as provided in 567—subrule 41.2(1) and do not show other actual or potential hazardous contamination by microorganisms. For a noncommunity system that only uses a cation-exchange softening unit that meets the requirements of 42.3(4)“a”(7), the requirement for continuous disinfection is based upon the system’s history of both coliform bacteria detection and compliance with the coliform bacteria monitoring requirements as provided in 567—subrule 41.2(1).

2. Method. Chlorine is the preferred disinfecting agent. Chlorination may be accomplished with liquid chlorine, calcium or sodium hypochlorites or chlorine dioxide. Other disinfecting agents will be considered, provided a residual can be maintained in the distribution system, reliable application equipment is available and testing procedures for a residual are recognized in Standard Methods for the Analysis of Water and Wastewater.

3. Chlorine residual. A minimum free available chlorine residual of 0.3 mg/L or a minimum total available chlorine residual of 1.5 mg/L must be continuously maintained throughout the water distribution system, except for those points in the distribution system that terminate as dead ends or areas that represent very low use when compared to usage throughout the rest of the distribution system as determined by the department. All systems using water to which chlorine has been added must monitor daily in the distribution system to ensure the minimum disinfectant residual concentration is met, including both wholesale systems and consecutive systems.

4. Test kit. A test kit capable of measuring free and combined chlorine residuals in increments no greater than 0.1 mg/L in the range below 0.5 mg/L, and in increments no greater than 0.2 mg/L in the range from 0.5 mg/L to 1.0 mg/L, and in increments no greater than 0.3 mg/L in the range from 1.0 mg/L to 2.0 mg/L must be provided at all chlorination facilities. The test kit must use a method of analysis that is recognized in Standard Methods for the Examination of Water and Wastewater.

5. Leak detection, control and operator protection. A bottle of at least 56 percent ammonium hydroxide must be provided at all gas chlorination installations for leak detection. Leak repair kits must be available where ton chlorine cylinders are used.

6. Other disinfectant residuals. If an alternative disinfecting agent is approved by this department, the residual levels and type of test kit used will be assigned by the department in accordance with and based upon analytical methods contained in Standard Methods for the Examination of Water and Wastewater.

(2) Phosphate compounds.

1. When phosphate compounds are to be added to any public water supply system which includes iron or manganese removal or ion-exchange softening, such compounds must be applied after the iron or manganese removal or ion-exchange softening treatment units, unless the director has received and approved an engineering report demonstrating the suitability for addition prior to these units in accordance with the provisions of 567—subrule 43.3(2). The department may require the discontinuance of phosphate addition where it interferes with other treatment processes, the operation of the water system or if there is a significant increase in microorganism populations associated with phosphate application.

2. The total phosphate concentration in the finished water must not exceed 10 mg/L as PO₄.

3. Chlorine shall be applied to the phosphate solution in sufficient quantity to give an initial concentration of 10 mg/L in the phosphate solution. A chlorine residual must be maintained in the phosphate solution at all times.

4. Test kits capable of measuring polyphosphate and orthophosphate in a range from 0.0 to 10.0 mg/L in increments no greater than 0.1 mg/L must be provided.

5. Continuous application or injection of phosphate compounds directly into a well is prohibited.

(3) Fluorosilicic acid. Where fluorosilicic acid (H_2SiF_6 , also called hydrofluosilicic acid) is added to a public water supply, the operator shall be equipped with a fluoride test kit with a minimum range of from 0.0 to 2.0 mg/L in increments no greater than 0.1 mg/L. Distilled water and standard fluoride solutions of 0.2 mg/L and 1.0 mg/L must be provided.

c. Reporting and record-keeping requirements for systems using surface water and groundwater under the direct influence of surface water. In addition to the monitoring requirements required by 42.4(3) "a" and "b," a public water system that uses a surface water source or a groundwater source under the direct influence of surface water must report monthly to the department the information specified in this subrule beginning June 29, 1993, or when filtration is installed, whichever is later.

(1) Turbidity measurements as required by 567—subrule 43.5(3) must be reported within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

1. The total number of filtered water turbidity measurements taken during the month.
2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in 567—paragraphs 43.5(3) "b" through "e" for the filtration technology being used.
3. The date and value of any turbidity measurements taken during the month which exceed 5 NTU. If at any time the turbidity exceeds 5 NTU, the system must inform the department as soon as possible, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements in 42.1(2). This requirement is in addition to the monthly reporting requirement, pursuant to 567—43.5(455B).

(2) Disinfection information specified in 567—subrule 43.5(2) and paragraph 42.4(3) "b" must be reported to the department within ten days after the end of each month the system serves water to the public. Information that must be reported includes:

1. For each day, the lowest measurement of residual disinfectant concentration in mg/L in water entering the distribution system.
2. The date and duration of each period when the residual disinfectant concentration in water entering the distribution system fell below 0.3 mg/L free residual chlorine or 1.5 mg/L total residual chlorine and when the department was notified of the occurrence.

If at any time the residual falls below 0.3 mg/L free residual chlorine or 1.5 mg/L total residual chlorine in the water entering the distribution system, the system must notify the department as soon as possible, but no later than by the end of the next business day. The system also must notify the department by the end of the next business day whether or not the residual was restored to at least 0.3 mg/L free residual chlorine or 1.5 mg/L total residual chlorine within four hours. This requirement is in addition to the monthly reporting requirement, pursuant to 567—43.5(455B).

3. The information on the samples taken in the distribution system in conjunction with total coliform monitoring listed in 567—paragraph 43.5(2) "d" and pursuant to 567—subparagraph 41.2(1) "c"(7).

(3) Total inactivation ratio. The total inactivation ratio must be calculated each day the treatment plant is in operation, pursuant to 567—paragraph 43.5(2) "a," and reported on the monthly operation report. If the total inactivation ratio is below 1.0, the system must notify the department within 24 hours.

d. Reporting and record-keeping requirements for disinfection byproducts, disinfectants, and disinfection byproduct precursors.

(1) General requirements.

1. In addition to the monitoring requirements required by 42.4(3) "a" and "b," a CWS or NTNC public water system that adds a chemical disinfectant to the water in any part of the drinking water treatment process or which provides water that contains a chemical disinfectant must report monthly to the department the information specified in this paragraph by the dates listed in 567—subparagraphs 41.6(1) "a"(3) and 43.6(1) "a"(3). A TNC public water system which adds chlorine dioxide as a disinfectant or oxidant must report monthly to the department the information specified in this paragraph by the dates listed in 567—paragraph 43.6(1) "a"(3) "3."

2. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public

notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected.

(2) Disinfection byproducts. Systems must report the information specified in the following table:

Disinfection Byproducts Reporting Table

| If you are a ... | You must report ... |
|---|--|
| System monitoring for TTHMs and HAA5 under the requirements of 567—subparagraph 41.6(1)“c”(4) on a quarterly or more frequent basis | <ol style="list-style-type: none"> 1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of all samples taken in the last quarter. 4. The annual arithmetic average of the quarterly arithmetic averages for the last four quarters.* 5. Whether the MCL was exceeded. 6. Under Stage 2, any operational evaluation levels that were exceeded during the quarter, including the location and date and the calculated TTHM and HAA5 levels. |
| System monitoring for TTHMs and HAA5 under the requirements of 567—subparagraph 41.6(1)“c”(4) less frequently than quarterly, but at least annually | <ol style="list-style-type: none"> 1. The number of samples taken during the last year. 2. The location, date, and result of each sample taken during the last monitoring period. 3. The arithmetic average of all samples taken over the last year.* 4. Whether the MCL was exceeded. |
| System monitoring for TTHMs and HAA5 under the requirements of 567—subparagraph 41.6(1)“c”(4) less frequently than annually | <ol style="list-style-type: none"> 1. The location, date, and result of the last sample taken. 2. Whether the MCL was exceeded. |
| System monitoring for chlorite under the requirements of 567—subparagraph 41.6(1)“c”(3) | <ol style="list-style-type: none"> 1. The number of samples taken each month for the last 3 months. 2. The location, date, and result of each sample taken during the last quarter. 3. For each month in the reporting period, the arithmetic average of all samples taken in each three sample set taken in the month. 4. Whether the MCL was exceeded, and in which month it was exceeded. |
| System monitoring for bromate under the requirements of 567—subparagraph 41.6(1)“c”(2) | <ol style="list-style-type: none"> 1. The number of samples taken during the last quarter. 2. The location, date, and result of each sample taken during the last quarter. 3. The arithmetic average of the monthly arithmetic averages of all samples taken in the last year. 4. Whether the MCL was exceeded. |

*The calculation of the running annual average will transition from a system-wide RAA calculation under Stage 1 to a locational running annual average (LRAA) under Stage 2. The transition will commence according to the system schedule listed in 567—paragraph 41.6(1)“b.” Beginning at the end of the fourth calendar quarter that follows the compliance date, and at the end of each subsequent quarter, the system must report the arithmetic average of quarterly results for the last four quarters of each monitoring location. If the calculated LRAA based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters, the system must report this information to the department no later than the due date of the next compliance report.

(3) Disinfectants. In addition to the requirements in 567—subparagraph 41.2(1)“c”(7), systems must report the information specified in the following table:

Disinfectants Reporting Table

| If you are a ... | You must report ... |
|---|---|
| System monitoring for chlorine or chloramines under the requirements of 567—paragraph 43.6(1) “c”(1)“2” | <ol style="list-style-type: none"> 1. The number of samples taken during each month of the last quarter. 2. The monthly arithmetic average of all samples taken in each month for the last 12 months. 3. The arithmetic average of all monthly averages for the last 12 months. 4. Whether the MRDL was exceeded. |
| System monitoring for chlorine dioxide under the requirements of 567—paragraph 43.6(1) “c”(1)“3” | <ol style="list-style-type: none"> 1. The dates, results, and locations of samples taken during the last quarter. 2. Whether the MRDL was exceeded. 3. Whether the MRDL was exceeded in any two consecutive daily samples and whether the resulting violation was acute or nonacute. |

(4) Disinfection byproduct precursors and enhanced coagulation or enhanced softening. Systems must report the information specified in the following table:

Disinfection Byproduct Precursors and Enhanced Coagulation or
Enhanced Softening Reporting Table

| If you are a ... | You must report ... |
|---|---|
| System monitoring monthly or quarterly for TOC under the requirements of 567—subparagraph 43.6(1)“c”(2) and required to meet the enhanced coagulation or enhanced softening requirements in 567—subparagraph 43.6(3)“b”(2) or (3) | <ol style="list-style-type: none"> 1. The number of paired (source water and treated water, prior to continuous disinfection) samples taken during the last quarter. 2. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 3. For each month in the reporting period that paired samples were taken, the arithmetic average of the percent reduction of TOC for each paired sample and the required TOC percent removal. 4. Calculations for determining compliance with the TOC percent removal requirements, as provided in 567—subparagraph 43.6(3)“c”(1). 5. Whether the system is in compliance with the enhanced coagulation or enhanced softening percent removal requirements in 567—paragraph 43.6(3)“b” for the last four quarters. |
| System monitoring monthly or quarterly for TOC under the requirements of 567—subparagraph 43.6(1)“c”(2) and meeting one or more of the alternative compliance criteria in 567—subparagraph 43.6(3)“a”(2) or (3) | <ol style="list-style-type: none"> 1. The alternative compliance criterion that the system is using. 2. The number of paired samples taken during the last quarter. 3. The location, date, and result of each paired sample and associated alkalinity taken during the last quarter. 4. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water TOC for systems meeting a criterion in 567—paragraph 43.6(3)“a”(2)“1” or “3” or of treated water TOC for systems meeting the criterion in 567—paragraph 43.6(3)“a”(2)“2.” 5. The running annual arithmetic average based on monthly averages (or quarterly samples) of source water SUVA for systems meeting the criterion in 567—paragraph 43.6(3)“a”(2)“5” or of treated water SUVA for systems meeting the criterion in 567—paragraph 43.6(3)“a”(2)“6.” 6. The running annual average of source water alkalinity for systems meeting the criterion in 567—paragraph 43.6(3)“a”(2)“3” and of treated water alkalinity for systems meeting the criterion in 567—paragraph 43.6(3)“a”(3)“1.” 7. The running annual average for both TTHM and HAA5 for systems meeting the criterion in 567—paragraph 43.6(3)“a”(2)“3” or “4.” 8. The running annual average for the amount of magnesium hardness removal (as CaCO₃, in mg/L) for systems meeting the criterion in 567—paragraph 43.6(3)“a”(3)“2.” <p>Whether the system is in compliance with the particular alternative compliance criterion in 567—subparagraph 43.6(3)“a”(2) or (3).</p> |
| SW/IGW system on reduced monitoring for TTHM/HAA5 under the requirements of 567—paragraph 41.6(3)“d” | <p>For each treatment plant that treats surface or IGW source water, report the following:</p> <ol style="list-style-type: none"> 1. The number of source water TOC samples taken each month during the last quarter. 2. The date and result of each sample taken during the last quarter. 3. The quarterly average of monthly samples taken during the last quarter or the result of the quarterly sample. 4. The running annual average (RAA) of quarterly averages from the past four quarters. 5. Whether the TOC RAA exceeded 4.0 mg/L. |

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—42.5(455B) Record maintenance.

42.5(1) Record maintenance requirements. Any owner or operator of a public water system subject to the provisions of this rule shall retain on its premises or at a convenient location near its premises the following records:

a. Analytical records.

(1) Actual laboratory reports shall be kept, or data may be transferred to tabular summaries, provided that the following information is included:

1. The date, place, and time of sampling, and the name of the person who collected the sample;

2. Identification of the sample as to whether it was a routine distribution system sample, check sample, raw or process water sample or other special purpose sample;

3. Date of analysis;
4. Laboratory and person responsible for performing analysis;
5. The analytical technique or method used; and
6. The results of the analysis.

(2) Record retention for specific analytes.

1. Microbiological and turbidity: Records of microbiological analyses and turbidity analyses made pursuant to 567—Chapters 41 and 43 shall be kept for not less than five years.

2. Chemical: radionuclide, inorganic compounds, organic compounds. Records of chemical analyses made pursuant to 567—Chapter 41 shall be kept for not less than ten years. Additional lead and copper requirements are listed in 42.5(1)“b.”

b. Lead and copper record-keeping requirements. A system subject to the requirements of 42.4(2) shall retain on its premises original records of all data and analyses, reports, surveys, public education, letters, evaluations, schedules, and any other information required by 567—41.4(455B) and 567—Chapter 43. Each water system shall retain the records required by this subrule for 12 years.

c. Records of action (violation correction). Records of action taken by the system to correct violations of primary drinking water regulations (including administrative orders) shall be kept for not less than five years after the last action taken with respect to the particular violation involved.

d. Reports and correspondence relating to sanitary surveys. Copies of any written reports, summaries, or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by any local, state or federal agency, shall be kept for a period of not less than ten years after completion of the sanitary survey involved.

e. Operation or construction permits. Records concerning an operation or a construction permit issued pursuant to 567—Chapter 43 to the system shall be kept for a period ending not less than ten years after the system achieves compliance with the maximum contaminant level, treatment technique, action level, or health advisory, or after the system in question completes the associated construction project.

f. Public notification. Records of public notification, including the Consumer Confidence Report, public notification examples, and public notice certifications, must be kept for at least five years.

g. Self-monitoring requirement records. The monthly records of operation must be completed as described in 42.4(3)“a”(2) and maintained at the facility for inspection by the department for a period of at least five years. All data generated at the facility to comply with the self-monitoring requirements must be retained for a period of at least five years, and must be maintained at the facility for inspection by the department. The data shall be in a form that allows easy retrieval and interpretation. Examples of data that must be retained include, but are not limited to, recorder charts, logbooks, bench sheets, SCADA records, and electronic files.

h. Monitoring plans. Copies of monitoring plans developed pursuant to 567—Chapters 41, 42, and 43 shall be kept for the same period of time as the records of analyses taken under the plans are required to be kept, unless otherwise specified.

i. Groundwater rule. Additional record-keeping requirements for the groundwater rule are listed in 567—paragraph 41.7(6)“b.”

j. Level 1 and 2 assessment forms and corrective action. These record-keeping requirements pertain to the coliform bacteria requirements in 567—subrule 41.2(1).

(1) The system must maintain any assessment form, regardless of who conducts the assessment, and documentation of corrective actions completed as a result of those assessments, or other available summary documentation of the sanitary defects and corrective actions taken under 567—paragraph 41.2(1)“m” for department review. This record must be maintained by the system for a period not less than five years after completion of the assessment or corrective action.

(2) The system must maintain a record of any repeat sample taken that meets department criteria for an extension of the 24-hour period for collecting repeat samples as provided for under 567—paragraph 41.2(1)“j.”

42.5(2) Reserved.

[**ARC 9915B**, IAB 12/14/11, effective 1/18/12; **ARC 3735C**, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

APPENDIX A:
STANDARD HEALTH EFFECTS LANGUAGE FOR PUBLIC NOTIFICATION

| Contaminant | Standard Health Effects Language |
|--|---|
| Microbiological Contaminants | |
| Coliform assessment and/or corrective action violations, under 567—subrule 41.2(1) | <p>Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found. [THE SYSTEM MUST INCLUDE THE FOLLOWING APPLICABLE SENTENCES]</p> <ul style="list-style-type: none"> ● We failed to conduct the required assessment. ● We failed to correct all identified sanitary defects that were found during the assessment(s). |
| <i>E. coli</i> | <i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. |
| <i>E. coli</i> assessment and/or corrective action violations, under 567—subrule 41.2(1) | <p><i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for <i>E. coli</i>, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found. [THE SYSTEM MUST INCLUDE THE FOLLOWING APPLICABLE SENTENCES]</p> <ul style="list-style-type: none"> ● We failed to conduct the required assessment. ● We failed to correct all identified sanitary defects that were found during the assessment(s). |
| Seasonal system treatment technique violation | <ul style="list-style-type: none"> ● When this violation includes the failure to monitor for total coliforms or <i>E. coli</i> prior to serving water to the public, the mandatory language for monitoring violation in 42.1(5) “c”(2) must be used. ● When this violation includes failure to complete other actions, the appropriate elements found in 42.1(5) “c” to describe the violation must be used. |
| Fecal indicators for the groundwater rule (<i>E. coli</i> , enterococci, and coliphage) | Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. |
| Groundwater Treatment Technique Requirements | |
| Groundwater rule treatment technique violations | Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches. |
| Surface Water Treatment Technique Requirements | |
| Turbidity | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, protozoa, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches, and can lead to death. |

| Contaminant | Standard Health Effects Language |
|---|---|
| Surface water/IGW system treatment technique requirements: CT ratio; residual disinfectant; log removal/inactivation of <i>Giardia</i> , viruses, and <i>Cryptosporidium</i> ; or filter backwash recycling | Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, protozoa, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches, and can lead to death. |
| Inorganic Chemical Contaminants | |
| Antimony | Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar. |
| Arsenic | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. |
| Asbestos | Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps. |
| Barium | Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure. |
| Beryllium | Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions. |
| Cadmium | Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage. |
| Chromium, total | Some people who drink water containing chromium well in excess of the MCL over many years could experience allergic dermatitis. |
| Copper | Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor. |
| Cyanide | Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid. |
| Fluoride | Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water above 2.0 mg/L may cause mottling of children's teeth, usually in children less than nine years of age. Mottling, also known as dental fluorosis, may include brown staining and pitting of the teeth, and occurs only in developing teeth before they erupt from the gums. |
| Lead | Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. |
| Mercury, inorganic | Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage. |
| Nitrate | Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| Nitrite | Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| Total Nitrate and Nitrite | Infants below the age of six months who drink water containing nitrate and nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| Selenium | Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience loss of hair or fingernails, numbness in fingers or toes, or problems with their circulation. |

| Contaminant | Standard Health Effects Language |
|---|---|
| Thallium | Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, changes in their blood, or problems with their kidneys, intestines, or liver. |
| Synthetic Organic Chemical Contaminants | |
| 2,4-D | Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands. |
| 2,4,5-TP (Silvex) | Some people who drink water containing Silvex in excess of the MCL over many years could experience liver problems. |
| Alachlor | Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer. |
| Atrazine | Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or have reproductive difficulties. |
| Benzo(a)pyrene (PAHs) | Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |
| Carbofuran | Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems. |
| Chlordane | Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer. |
| Dalapon | Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes. |
| Di(2-ethylhexyl)adipate | Some people who drink water containing di(2-ethylhexyl)adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties. |
| Di(2-ethylhexyl)-phthalate | Some people who drink water containing di(2-ethylhexyl)phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer. |
| Dibromochloropropane (DBCP) | Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer. |
| Dinoseb | Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties. |
| Dioxin (2,3,7,8-TCDD) | Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer. |
| Diquat | Some people who drink water containing diquat in excess of the MCL over many years could get cataracts. |
| Endothall | Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines. |
| Endrin | Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems. |
| Ethylene dibromide | Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system, or kidneys, and may have an increased risk of getting cancer. |
| Glyphosate | Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties. |

| Contaminant | Standard Health Effects Language |
|---|---|
| Heptachlor | Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer. |
| Heptachlor epoxide | Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer. |
| Hexachlorobenzene | Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer. |
| Hexachloro-cyclopentadiene | Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach. |
| Lindane | Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver. |
| Methoxychlor | Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties. |
| Oxamyl (Vydate) | Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects. |
| Pentachlorophenol | Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer. |
| Picloram | Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver. |
| Polychlorinated byphenyls (PCBs) | Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer. |
| Simazine | Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood. |
| Toxaphene | Some people who drink water containing toxaphene in excess of the MCL over many years could experience problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer. |
| Volatile Organic Chemical Contaminants (VOCs) | |
| Benzene | Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer. |
| Carbon tetrachloride | Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| Chlorobenzene (monochlorobenzene) | Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys. |
| o-Dichlorobenzene | Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory system. |
| p-Dichlorobenzene | Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood. |
| 1,2-Dichloroethane | Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer. |
| 1,1-Dichloroethylene | Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |
| cis-1,2-Dichloroethylene | Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |

| Contaminant | Standard Health Effects Language |
|-----------------------------|---|
| trans-1,2-Dichloroethylene | Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver. |
| Dichloromethane | Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer. |
| 1,2-Dichloropropane | Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer. |
| Ethylbenzene | Some people who drink water containing ethylbenzene well in excess of the MCL over many years could experience problems with their liver or kidneys. |
| Styrene | Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system. |
| Tetrachloroethylene | Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer. |
| Toluene | Some people who drink water containing toluene in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver. |
| 1,2,4-Trichlorobenzene | Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands. |
| 1,1,1-Trichloroethane | Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system. |
| 1,1,2-Trichloroethane | Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune system. |
| Trichloroethylene | Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| Vinyl chloride | Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer. |
| Xylene (total) | Some people who drink water containing total xylene in excess of the MCL over many years could experience damage to their nervous system. |
| Radionuclide Contaminants | |
| Alpha emitters | Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Beta/photon emitters | Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Combined radium (226 & 228) | Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer. |
| Uranium | Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity. |
| Disinfection Byproducts | |
| Bromate | Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. |
| Chlorite | Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia. |
| Haloacetic Acids (HAA) | Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. |

| Contaminant | Standard Health Effects Language |
|--|--|
| Total Trihalomethanes (TTHMs) | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. |
| Residual Disinfectants | |
| Chloramines | Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia. |
| Chlorine | Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort. |
| Chlorine dioxide—acute (one or more distribution samples exceed the MRDL) | Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. The chlorine dioxide violations reported today include exceedances of the standard within the distribution system which delivers water to consumers. Violations of the chlorine dioxide standard within the distribution system may harm human health based on short-term exposures. Certain groups, including fetuses, infants, and young children, may be especially susceptible to nervous system effects from excessive chlorine dioxide exposure. |
| Chlorine dioxide—non-acute (two consecutive daily samples taken at the source entry point to the distribution system are above the MRDL) | Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. The chlorine dioxide violations reported today are the result of exceedances at the treatment facility only, not within the distribution system which delivers water to consumers. Continued compliance with chlorine dioxide levels within the distribution system minimizes the potential risk of these violations to consumers. |
| Disinfection Byproduct Precursors | |
| Total Organic Carbon (TOC) | Total organic carbon has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids. Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver, or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer. |
| Other Treatment Techniques | |
| Acrylamide | Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer. |
| Epichlorohydrin | Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer. |

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

**APPENDIX B:
MINIMUM SELF-MONITORING REQUIREMENTS (SMR)**

I. Minimum Self-Monitoring Requirements for TNCs (excluding surface water or influenced groundwater PWSs)

Notes:

- The self-monitoring requirements (SMRs) only apply to those supplies meeting the required operation records applicability criteria in 42.4(3) “a”(1).
- TNCs are exempt from the self-monitoring requirements for point-of-use treatment devices, unless the device is used to remove a contaminant which has a maximum contaminant level or treatment technique, in which case additional SMRs will be assigned by the department.
 - Daily monitoring for TNCs applies only when the facility is in operation.
 - Additional or more frequent monitoring requirements may be assigned by the department in the operation permit.
- Additional SMRs are required if treatment is used to remove a regulated contaminant. See Section II for the requirements under the specific treatment type.

General Requirements

All TNCs which meet the required operation records applicability criteria in 42.4(3) “a”(1) must measure the following parameters, where applicable. Additional SMRs are required if treatment is used to remove a contaminant which has a maximum contaminant level or treatment technique. See Section II for the requirements under the specific treatment type.

| | PWS Type: | TNC* |
|--|----------------------------------|------------------|
| Parameter | Sample Site | Frequency |
| Pumpage (Flow) | raw: final: | 1/week 1/week |
| Disinfectant Residual*** | final: distribution system**: | 1/day 1/day |
| Disinfectant, quantity used | day tank/scale: | 1/day |
| Static Water and Pumping Water Levels (Drawdown) | each active well: | 1/month |

*TNCs must measure and record the total water used each week, but daily measurements are recommended, and may be required by the department in specific PWSs.

**Monitoring is to be conducted at representative points in the distribution system which adequately demonstrate compliance with 42.4(3) “b”(1).

***The department may reduce the required sample site locations for a system with a minimal distribution system and only hydropneumatic tank storage.

II. Minimum Self-Monitoring Requirements for CWS, NTNC, and IGW/SW TNC

Notes:

- The self-monitoring requirements (SMR) only apply to those supplies meeting the required operation records applicability criteria in 42.4(3) “a”(1).
- NTNCs are exempt from the self-monitoring requirements for point-of-use treatment devices, unless the device is used to remove a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory, in which case additional SMRs will be assigned by the department.
 - Daily monitoring for NTNCs applies only when the facility is in operation.
 - These are the minimum self-monitoring requirements. Additional or more frequent monitoring requirements may be assigned by the department in the operation permit.

A. General Requirements

All PWSs which meet the required operation records applicability criteria in 42.4(3) "a"(1) must measure the following parameters, where applicable:

| | PWS Type: | NTNC* & IGW/SW TNC | CWS |
|--|---------------------------|----------------------------|-------------------------|
| Parameter | Sample Site | Frequency | Frequency |
| Pumpage (Flow) | raw: bypass: final: | 1/week 1/week 1/week | 1/day 1/day 1/day |
| Static Water and Pumping Water Levels (Drawdown) | each active well: | 1/month | 1/month |

*NTNCs must measure and record the total water used each week, but daily measurements are recommended, and may be required by the department in specific PWSs.

B. Chemical Addition

All PWSs which apply chemicals in the treatment process must monitor the following parameters, for the applicable processes:

| | Pumpage or Flow: | <0.1 MGD | 0.1-0.5 MGD | >0.5 MGD |
|-------------------------------|---------------------------------|--------------------|------------------|------------------|
| Parameter | Sample Site | Frequency | Frequency | Frequency |
| DISINFECTION | | | | |
| Disinfectant Residual** | final: distribution system*: | 1/day 1/day | 1/day 1/day | 1/day 1/day |
| Disinfectant, quantity used | day tank/scale: | 1/day | 1/day | 1/day |
| FLUORIDATION | | | | |
| Fluoride | raw: final: | 1/quarter 1/day | 1/month 1/day | 1/month 1/day |
| Fluoride, quantity used | day tank/scale: | 1/day | 1/day | 1/day |
| pH ADJUSTMENT | | | | |
| pH | final: | 1/week | 2/week | 1/day |
| Caustic Soda, quantity used | day tank/scale: | 1/week | 1/week | 1/week |
| PHOSPHATE ADDITION | | | | |
| Phosphate, as PO ₄ | final: | 1/week | 2/week | 1/day |
| Phosphate, quantity used | day tank/scale: | 1/week | 1/week | 1/week |
| OTHER CHEMICALS | | | | |
| Chemical | final: | 1/week | 2/week | 1/day |
| Chemical, quantity used | day tank/scale: | 1/week | 1/week | 1/week |

*Monitoring is to be conducted at representative points in the distribution system which adequately demonstrate compliance with 42.4(3) "b"(1).

**The department may reduce the required sample site locations for a system with a minimal distribution system, only hydropneumatic tank storage, and, if a CWS, it serves less than 100 persons.

C. Iron or Manganese Removal

Nonmunicipalities except rural water systems, benefited water districts, and publicly owned PWSs are exempt from monitoring of iron/manganese removal equipment unless the treatment is or was installed to remove a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory. Any chemicals which are applied during the treatment process must be measured under section “B. Chemical Addition” of this table.

| | Pumpage or Flow: | <0.1 MGD | 0.1-0.5 MGD | >0.5 MGD |
|-----------|------------------|-----------|-------------|-----------|
| Parameter | Sample Site | Frequency | Frequency | Frequency |
| Iron | raw: | 1/quarter | 1/month | 1/month |
| | final: | 1/week | 2/week | 1/day |
| Manganese | raw: | 1/quarter | 1/month | 1/month |
| | final: | 1/week | 2/week | 1/day |

D. pH Adjustment for Iron and Manganese Removal, by precipitation and coagulation processes utilizing lime, soda ash, or other chemical additions. Testing is only required if a specific chemical is added.

| | Pumpage or Flow: | <0.1 MGD | 0.1-0.5 MGD | >0.5 MGD |
|------------|------------------|-----------|-------------|-----------|
| Parameter | Sample Site | Frequency | Frequency | Frequency |
| Alkalinity | raw: | 1/quarter | 1/month | 1/month |
| | final: | 1/week | 2/week | 1/day |
| Iron | raw: | 1/quarter | 1/month | 1/month |
| | final: | 1/week | 2/week | 1/day |
| Manganese | raw: | 1/quarter | 1/month | 1/month |
| | final: | 1/week | 2/week | 1/day |
| pH | raw: | 1/week | 1/week | 1/week |
| | final: | 1/week | 2/week | 1/day |

E. Cation Exchange (Zeolite) Softening

Nonmunicipalities except for rural water systems and benefited water districts are exempt from the monitoring of water quality parameters associated with ion-exchange softening unless the treatment is or was installed to remove a contaminant which has a maximum contaminant level, treatment technique, action level, or health advisory. An annual sodium sample of the final water is required of all community systems that use cation exchange softening, and will also meet the special sodium monitoring requirement of 567—paragraph 41.11(1)“f.”

| | Pumpage or Flow: | <0.1 MGD | 0.1-0.5 MGD | >0.5 MGD |
|-------------------------------|------------------|-----------|-------------|-----------|
| Parameter | Sample Site | Frequency | Frequency | Frequency |
| Hardness as CaCO ₃ | raw: | 1/quarter | 1/month | 1/month |
| | final: | 1/week | 2/week | 1/day |
| pH | final: | 1/week | 2/week | 1/day |
| Sodium* | final: | 1/year | 1/year | 1/year |

*The annual sodium sample required in 567—paragraph 41.11(1)“f” will satisfy this requirement.

F. Direct Filtration of Surface Waters or Influenced Groundwaters

| | Pumpage or Flow: | All |
|-----------------------------|--|--|
| Parameter | Sample Site | Frequency |
| CT Ratio | final: | 1/day |
| Disinfectant Residual* | source/entry point: distribution system*: | continuous daily |
| Disinfectant, quantity used | day tank/scale: | 1/day |
| pH | final: | 1/day |
| Temperature | raw: | 1/day |
| Turbidity | raw: final: | see 567—subrules 43.5(3) and 43.5(4), and 567—43.9(455B) for the specific requirements |

*Monitoring is to be conducted to demonstrate compliance with paragraph 42.4(3) “b,” 567—subrules 43.5(2) and 43.5(4), and 567—43.6(455B).

G. Clarification or Lime Softening of Surface Waters or Influenced Groundwaters

| | Pumpage or Flow: | All |
|-------------------------------|--|--|
| Parameter | Sample Site | Frequency |
| Alkalinity | raw: final: | 1/day 1/day |
| Caustic Soda, quantity used | day tank/scale: | 1/week |
| CT Ratio | final: | 1/day |
| Disinfectant Residual* | source/entry point: distribution system*: | continuous daily |
| Disinfectant, quantity used | day tank/scale: | 1/day |
| Hardness as CaCO ₃ | raw: final: | 1/day 1/day |
| Odor | raw: final: | 1/week 1/day |
| pH | raw: final: | 1/day 1/day |
| Temperature | raw: | 1/day |
| Turbidity | raw: final: | see 567—subrules 43.5(3) and 43.5(4), and 567—43.9(455B) for the specific requirements |

*Monitoring is to be conducted to demonstrate compliance with paragraph 42.4(3) “b,” 567—subrules 43.5(2) and 43.5(4), and 567—43.6(455B).

H. Lime Softening of Groundwaters (excluding IGW)

| | Pumpage or Flow: | <0.1 MGD | >0.1 MGD |
|-------------------------------|------------------|-----------|-----------|
| Parameter | Sample Site | Frequency | Frequency |
| Alkalinity | raw: | 1/quarter | 1/month |
| | final: | 1/day | 1/day |
| Hardness as CaCO ₃ | raw: | 1/quarter | 1/month |
| | final: | 1/day | 1/day |
| pH | raw: | 1/week | 1/week |
| | final: | 1/day | 1/day |
| Temperature | raw: | 1/week | 1/week |

I. Reverse Osmosis or Electrodialysis

| | Pumpage or Flow: | <0.1 MGD | >0.1 MGD |
|-------------------------------|------------------|-----------|-----------|
| Parameter | Sample Site | Frequency | Frequency |
| Alkalinity | raw: | 1/quarter | 1/month |
| | final: | 1/day | 1/day |
| Hardness as CaCO ₃ | raw: | 1/quarter | 1/month |
| | final: | 1/day | 1/day |
| Iron | raw: | 1/day | 1/day |
| Manganese | raw: | 1/day | 1/day |
| pH | raw: | 1/week | 1/week |
| | final: | 1/day | 1/day |
| Total Dissolved Solids | raw: | 1/month | 1/month |

J. Anion Exchange (i.e., Nitrate Reduction)

| | Pumpage or Flow: | <0.1 MGD | >0.1 MGD |
|-----------|------------------|-----------|-----------|
| Parameter | Sample Site | Frequency | Frequency |
| Nitrate | raw: | 1/day | 1/day |
| | final: | 1/day | 1/day |
| Sulfate | raw: | 1/week | 1/week |
| | final: | 1/week | 1/week |

K. Activated Carbon for TTHM, VOC, or SOC Removal (GAC or PAC)

| | Pumpage or Flow: | <0.1 MGD | >0.1 MGD |
|----------------------------|------------------|-----------|-----------|
| Parameter | Sample Site | Frequency | Frequency |
| Total Organic Carbon (TOC) | final: | 1/quarter | 1/month |

L. Air-Stripping for TTHM, VOC, or SOC Removal

| | Pumpage or Flow: | <0.1 MGD | >0.1 MGD |
|----------------------------|------------------|-----------|-----------|
| Parameter | Sample Site | Frequency | Frequency |
| Total Organic Carbon (TOC) | final: | 1/quarter | 1/month |

M. Lead and Copper: Corrosion Control and Water Quality Parameters

The specific SMRs for corrosion control and water quality parameters are listed in 567—paragraph 41.4(1) “d” and 567—subrules 43.8(1) and 43.8(2).

N. Consecutive PWSs Supplied by a Surface Water or IGW PWS

| | Pumpage or Flow: | All |
|---|-----------------------|-----------|
| Parameter | Sample Site | Frequency |
| Disinfectant Residual | source/entry point: | 1/day |
| | distribution system*: | 1/day |
| Disinfectant, quantity used (if applicable) | day tank/scale: | 1/day |
| Pumpage or Flow | master meter: | 1/day |

*Monitoring is to be conducted at representative points in the distribution system.

APPENDIX C:
REGULATED CONTAMINANTS TABLE FOR CONSUMER CONFIDENCE REPORT

| Key | | | | | | |
|------------------------------|--------------|---------------------------------------|--|----------------------|--------------------------------------|---|
| | AL | | Action Level | | | |
| | MCL | | Maximum Contaminant Level | | | |
| | MCLG | | Maximum Contaminant Level Goal | | | |
| | MFL | | million fibers per liter | | | |
| | MRDL | | Maximum Residual Disinfectant Level | | | |
| | MRDLG | | Maximum Residual Disinfectant Level Goal | | | |
| | mrem/year | | millirems per year (a measure of radiation absorbed by the body) | | | |
| | n/a | | not applicable | | | |
| | NTU | | nephelometric turbidity units (a measure of water clarity) | | | |
| | pCi/L | | picocuries per liter (a measure of radioactivity) | | | |
| | ppb | | parts per billion, or micrograms per liter (µg/L) | | | |
| | ppm | | parts per million, or milligrams per liter (mg/L) | | | |
| | ppq | | parts per quadrillion, or picograms per liter (pg/L) | | | |
| | ppt | | parts per trillion, or nanograms per liter (ng/L) | | | |
| | TT | | Treatment Technique | | | |
| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
| Microbiological Contaminants | | | | | | |
| Total coliform bacteria | TT | | TT | n/a | Naturally present in the environment | Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|--|--|---------------------------------|--|-------------------|--------------------------------------|---|
| <i>E. coli</i> | Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive, or system fails to take repeat samples following <i>E. coli</i> -positive routine sample, or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i> | | Routine and repeat samples are total coliform-positive and either is <i>E. coli</i> -positive, or system fails to take repeat samples following <i>E. coli</i> -positive routine sample, or system fails to analyze total coliform-positive repeat sample for <i>E. coli</i> | 0 | Human and animal fecal waste | <i>E. coli</i> are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. |
| Fecal indicators (enterococci or coliphage) | TT | | TT | n/a | Human and animal fecal waste | Fecal indicators are microbes whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems. |
| Disinfection Byproduct Precursor Removal Requirements for Surface & Influenced Groundwater Systems | | | | | | |
| Total organic carbon (ppm) | TT | | TT | n/a | Naturally present in the environment | Total organic carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes (THMs) and haloacetic acids (HAAs). Drinking water containing these byproducts in excess of the MCL may lead to adverse health effects, liver, or kidney problems, or nervous system effects, and may lead to an increased risk of getting cancer. |
| Surface Water & Influenced Groundwater System Treatment Requirements | | | | | | |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|---|----------------------|---------------------------------|------------------|-------------------|---|--|
| Turbidity (NTU) | TT | | TT | n/a | Soil runoff | Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, protozoa, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches, and can lead to death. |
| Surface water/IGW system treatment technique requirements: CT ratio; residual disinfectant; log removal/inactivation of <i>Giardia</i> , viruses, and <i>Cryptosporidium</i> ; or filter backwash recycling | TT | | TT | n/a | Soil runoff | Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, protozoa, and parasites, which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches, and can lead to death. |
| Radionuclide Contaminants | | | | | | |
| Gross alpha emitters (pCi/L) | 15 pCi/L | | 15 | 0 | Erosion of natural deposits | Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Beta/photon emitters (mrem/yr) | 4 mrem/yr | | 4 | 0 | Decay of natural and man-made deposits | Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of the MCL over many years may have an increased risk of getting cancer. |
| Radium, combined 226 and 228 (pCi/L) | 5 pCi/L | | 5 | 0 | Erosion of natural deposits | Some people who drink water containing radium 226 or 228 in excess of the MCL over many years may have an increased risk of getting cancer. |
| Uranium (µg/L) | 30 µg/L (footnote 2) | | 30 | 0 | Erosion of natural deposits | Some people who drink water containing uranium in excess of the MCL over many years may have an increased risk of getting cancer and kidney toxicity. |
| Inorganic Contaminants | | | | | | |
| Antimony (ppb) | 0.006 | 1000 | 6 | 6 | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder | Some people who drink water containing antimony well in excess of the MCL over many years could experience increases in blood cholesterol and decreases in blood sugar. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|----------------------------|--------------------|---------------------------------|------------------|-------------------|---|--|
| Arsenic (ppb) ³ | 0.010 ³ | 1000 | 10 ³ | 0 ³ | Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes | Some people who drink water containing arsenic in excess of the MCL over many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer. |
| Asbestos (MFL) | 7 MFL | | 7 | 7 | Decay of asbestos cement water mains; erosion of natural deposits | Some people who drink water containing asbestos in excess of the MCL over many years may have an increased risk of developing benign intestinal polyps. |
| Barium (ppm) | 2 | | 2 | 2 | Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits | Some people who drink water containing barium in excess of the MCL over many years could experience an increase in their blood pressure. |
| Beryllium (ppb) | 0.004 | 1000 | 4 | 4 | Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries | Some people who drink water containing beryllium well in excess of the MCL over many years could develop intestinal lesions. |
| Bromate (ppb) | 0.010 | 1000 | 10 | 0 | Byproduct of drinking water disinfection | Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer. |
| Cadmium (ppb) | 0.005 | 1000 | 5 | 5 | Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints | Some people who drink water containing cadmium in excess of the MCL over many years could experience kidney damage. |
| Chloramines (ppm) | MRDL = 4.0 | | MRDL = 4.0 | MRDLG = 4.0 | Water additive used to control microbes | Some people who use water containing chloramines well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of the MRDL could experience stomach discomfort or anemia. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|-------------------------|--------------|---------------------------------|------------------|-------------------|---|---|
| Chlorine (ppm) | MRDL = 4.0 | | MRDL = 4.0 | MRDLG = 4.0 | Water additive used to control microbes | Some people who use water containing chlorine well in excess of the MRDL could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of the MRDL could experience stomach discomfort. |
| Chlorine dioxide (ppb) | MRDL = 0.8 | 1000 | MRDL = 800 | MRDLG = 800 | Water additive used to control microbes | Some infants and young children who drink water containing chlorine dioxide in excess of the MRDL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of the MRDL. Some people may experience anemia. |
| Chlorite (ppm) | 1.0 | | 1.0 | 0.8 | Byproduct of drinking water disinfection | Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia. |
| Chromium (ppb) | 0.1 | 1000 | 100 | 100 | Discharge from steel and pulp mills; erosion of natural deposits | Some people who use water containing chromium well in excess of the MCL over many years could experience allergic dermatitis. |
| Copper (ppm) | AL = 1.3 | | AL = 1.3 | 1.3 | Corrosion of household plumbing systems; erosion of natural deposits | Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's Disease should consult their personal doctor. |
| Cyanide (ppb) | 0.2 | 1000 | 200 | 200 | Discharge from steel, metal, plastic, and fertilizer factories | Some people who drink water containing cyanide well in excess of the MCL over many years could experience nerve damage or problems with their thyroid. |
| Fluoride (ppm) | 4.0 | | 4.0 | 4.0 | Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories | Some people who drink water containing fluoride in excess of the MCL over many years could get bone disease, including pain and tenderness of the bones. Fluoride in drinking water at half the MCL (2.0 ppm) or more may cause mottling of children's teeth, usually in children less than nine years of age. Mottling, also known as dental fluorosis, may include brown staining or pitting of the teeth, and occurs only in the developing teeth before they erupt from the gums. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|--------------------------------|--------------|---------------------------------|------------------|-------------------|--|---|
| Lead (ppb) | AL = 0.015 | 1000 | AL = 15 | 0 | Corrosion of household plumbing systems; erosion of natural deposits | Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure. |
| Mercury, inorganic (ppb) | 0.002 | 1000 | 2 | 2 | Erosion of natural deposits; discharge from refineries and factories; runoff from landfills; runoff from cropland | Some people who drink water containing inorganic mercury well in excess of the MCL over many years could experience kidney damage. |
| Nitrate, as N (ppm) | 10 | | 10 | 10 | Runoff from fertilizer use; leaching from septic tanks or sewage; erosion of natural deposits | Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| Nitrite, as N (ppm) | 1.0 | | 1.0 | 1.0 | Conversion of ammonia; runoff from fertilizer use; leaching from septic tanks or sewage; erosion of natural deposits | Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. |
| Selenium (ppb) | 0.05 | 1000 | 50 | 50 | Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines | Selenium is an essential nutrient. However, some people who drink water containing selenium in excess of the MCL over many years could experience hair or fingernail losses, numbness in fingers or toes, or problems with their circulation. |
| Thallium (ppb) | 0.002 | 1000 | 2 | 0.5 | Leaching from ore-processing sites; discharge from electronics, glass, and drug factories | Some people who drink water containing thallium in excess of the MCL over many years could experience hair loss, change in their blood, or problems with their kidneys, intestines, or liver. |
| Synthetic Organic Contaminants | | | | | | |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|-------------------------------|--------------|---------------------------------|------------------|-------------------|---|--|
| 2,4-D (ppb) | 0.07 | 1000 | 70 | 70 | Runoff from herbicide used on row crops | Some people who drink water containing the weed killer 2,4-D well in excess of the MCL over many years could experience problems with their kidneys, liver, or adrenal glands. |
| 2,4,5-TP Silvex (ppb) | 0.05 | 1000 | 50 | 50 | Residue of banned herbicide | Some people who drink water containing Silvex in excess of the MCL over many years could experience liver problems. |
| Acrylamide | TT | | TT | 0 | Added to water during sewage/wastewater treatment | Some people who drink water containing high levels of acrylamide over a long period of time could have problems with their nervous system or blood, and may have an increased risk of getting cancer. |
| Alachlor (ppb) | 0.002 | 1000 | 2 | 0 | Runoff from herbicide used on row crops | Some people who drink water containing alachlor in excess of the MCL over many years could have problems with their eyes, liver, kidneys, or spleen, or experience anemia, and may have an increased risk of getting cancer. |
| Atrazine (ppb) | 0.003 | 1000 | 3 | 3 | Runoff from herbicide used on row crops | Some people who drink water containing atrazine well in excess of the MCL over many years could experience problems with their cardiovascular system or reproductive difficulties. |
| Benzo(a)pyrene, PAH (ppt) | 0.0002 | 1,000,000 | 200 | 0 | Leaching from linings of water storage tanks and distribution lines | Some people who drink water containing benzo(a)pyrene in excess of the MCL over many years may experience reproductive difficulties and may have an increased risk of getting cancer. |
| Carbofuran (ppb) | 0.04 | 1000 | 40 | 40 | Leaching of soil fumigant used on rice and alfalfa | Some people who drink water containing carbofuran in excess of the MCL over many years could experience problems with their blood, or nervous or reproductive systems. |
| Chlordane (ppb) | 0.002 | 1000 | 2 | 0 | Residue of banned termiticide | Some people who drink water containing chlordane in excess of the MCL over many years could experience problems with their liver or nervous system, and may have an increased risk of getting cancer. |
| Dalapon (ppb) | 0.2 | 1000 | 200 | 200 | Runoff from herbicide used on rights of way | Some people who drink water containing dalapon well in excess of the MCL over many years could experience minor kidney changes. |
| Di(2-ethylhexyl)adipate (ppb) | 0.4 | 1000 | 400 | 400 | Discharge from chemical factories | Some people who drink water containing di(2-ethylhexyl)adipate well in excess of the MCL over many years could experience toxic effects such as weight loss, liver enlargement, or possible reproductive difficulties. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|-----------------------------------|--------------|---------------------------------|------------------|-------------------|---|---|
| Di(2-ethylhexyl)phthalate (ppb) | 0.006 | 1000 | 6 | 0 | Discharge from rubber and chemical factories | Some people who drink water containing di(2-ethylhexyl)phthalate well in excess of the MCL over many years may have problems with their liver, or experience reproductive difficulties, and may have an increased risk of getting cancer. |
| Dibromochloropropane [DBCP] (ppt) | 0.0002 | 1,000,000 | 200 | 0 | Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards | Some people who drink water containing DBCP in excess of the MCL over many years could experience reproductive problems and may have an increased risk of getting cancer. |
| Dinoseb (ppb) | 0.007 | 1000 | 7 | 7 | Runoff from herbicide used on soybeans and vegetables | Some people who drink water containing dinoseb well in excess of the MCL over many years could experience reproductive difficulties. |
| Diquat (ppb) | 0.02 | 1000 | 20 | 20 | Runoff from herbicide use | Some people who drink water containing diquat in excess of the MCL over many years could get cataracts. |
| Dioxin [2,3,7,8-TCDD] (ppq) | 0.00000003 | 1,000,000,000 | 30 | 0 | Emissions from waste incineration and other combustion; discharge from chemical factories | Some people who drink water containing dioxin in excess of the MCL over many years could experience reproductive difficulties and may have an increased risk of getting cancer. |
| Endothall (ppb) | 0.1 | 1000 | 100 | 100 | Runoff from herbicide use | Some people who drink water containing endothall in excess of the MCL over many years could experience problems with their stomach or intestines. |
| Endrin (ppb) | 0.002 | 1000 | 2 | 2 | Residue of banned insecticide | Some people who drink water containing endrin in excess of the MCL over many years could experience liver problems. |
| Epichlorohydrin | TT | | TT | 0 | Discharge from industrial chemical factories; an impurity of some water treatment chemicals | Some people who drink water containing high levels of epichlorohydrin over a long period of time could experience stomach problems, and may have an increased risk of getting cancer. |
| Ethylene dibromide (ppt) | 0.0005 | 1,000,000 | 50 | 0 | Discharge from petroleum refineries | Some people who drink water containing ethylene dibromide in excess of the MCL over many years could experience problems with their liver, stomach, reproductive system or kidneys, and may have an increased risk of getting cancer. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|---------------------------------|--------------|---------------------------------|------------------|-------------------|---|---|
| Glyphosate (ppb) | 0.7 | 1000 | 700 | 700 | Runoff from herbicide use | Some people who drink water containing glyphosate in excess of the MCL over many years could experience problems with their kidneys or reproductive difficulties. |
| Haloacetic Acids (HAA) (ppb) | 0.060 | 1000 | 60 | (footnote 4) | Byproduct of drinking water disinfection | Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer. |
| Heptachlor (ppt) | 0.0004 | 1,000,000 | 400 | 0 | Residue of banned pesticide | Some people who drink water containing heptachlor in excess of the MCL over many years could experience liver damage and may have an increased risk of getting cancer. |
| Heptachlor epoxide (ppt) | 0.0002 | 1,000,000 | 200 | 0 | Breakdown of heptachlor | Some people who drink water containing heptachlor epoxide in excess of the MCL over many years could experience liver damage, and may have an increased risk of getting cancer. |
| Hexachlorobenzene (ppb) | 0.001 | 1000 | 1 | 0 | Discharge from metal refineries and agricultural chemical factories | Some people who drink water containing hexachlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys, or adverse reproductive effects, and may have an increased risk of getting cancer. |
| Hexachlorocyclopentadiene (ppb) | 0.05 | 1000 | 50 | 50 | Discharge from chemical factories | Some people who drink water containing hexachlorocyclopentadiene well in excess of the MCL over many years could experience problems with their kidneys or stomach. |
| Lindane (ppt) | 0.0002 | 1,000,000 | 200 | 200 | Runoff/leaching from insecticide used on cattle, lumber, gardens | Some people who drink water containing lindane in excess of the MCL over many years could experience problems with their kidneys or liver. |
| Methoxychlor (ppb) | 0.04 | 1000 | 40 | 40 | Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock | Some people who drink water containing methoxychlor in excess of the MCL over many years could experience reproductive difficulties. |
| Oxamyl [Vydate] (ppb) | 0.2 | 1000 | 200 | 200 | Runoff/leaching from insecticide used on apples, potatoes, and tomatoes | Some people who drink water containing oxamyl in excess of the MCL over many years could experience slight nervous system effects. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|--|--------------|---------------------------------|------------------|-------------------|--|---|
| PCBs [polychlorinated byphenyls] (ppt) | 0.0005 | 1,000,000 | 500 | 0 | Runoff from landfills; discharge of waste chemicals | Some people who drink water containing PCBs in excess of the MCL over many years could experience changes in their skin, problems with their thymus gland, immune deficiencies, or reproductive or nervous system difficulties, and may have an increased risk of getting cancer. |
| Pentachlorophenol (ppb) | 0.001 | 1000 | 1 | 0 | Discharge from wood preserving factories | Some people who drink water containing pentachlorophenol in excess of the MCL over many years could experience problems with their liver or kidneys, and may have an increased risk of getting cancer. |
| Picloram (ppb) | 0.5 | 1000 | 500 | 500 | Herbicide runoff | Some people who drink water containing picloram in excess of the MCL over many years could experience problems with their liver. |
| Simazine (ppb) | 0.004 | 1000 | 4 | 4 | Herbicide runoff | Some people who drink water containing simazine in excess of the MCL over many years could experience problems with their blood. |
| Toxaphene (ppb) | 0.003 | 1000 | 3 | 0 | Runoff/ leaching from insecticide used on cotton and cattle | Some people who drink water containing toxaphene in excess of the MCL over many years could have problems with their kidneys, liver, or thyroid, and may have an increased risk of getting cancer. |
| Volatile Organic Contaminants | | | | | | |
| Benzene (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from factories; leaching from gasoline storage tanks and landfills | Some people who drink water containing benzene in excess of the MCL over many years could experience anemia or a decrease in blood platelets, and may have an increased risk of getting cancer. |
| Carbon tetrachloride (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from chemical plants and other industrial activities | Some people who drink water containing carbon tetrachloride in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| Chlorobenzene (ppb) | 0.1 | 1000 | 100 | 100 | Discharge from chemical and agricultural chemical factories | Some people who drink water containing chlorobenzene in excess of the MCL over many years could experience problems with their liver or kidneys. |
| o-Dichlorobenzene (ppb) | 0.6 | 1000 | 600 | 600 | Discharge from industrial chemical factories | Some people who drink water containing o-dichlorobenzene well in excess of the MCL over many years could experience problems with their liver, kidneys, or circulatory system. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|----------------------------------|--------------|---------------------------------|------------------|-------------------|---|--|
| p-Dichlorobenzene (ppb) | 0.075 | 1000 | 75 | 75 | Discharge from industrial chemical factories | Some people who drink water containing p-dichlorobenzene in excess of the MCL over many years could experience anemia, damage to their liver, kidneys, or spleen, or changes in their blood. |
| 1,2-Dichloroethane (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from industrial chemical factories | Some people who drink water containing 1,2-dichloroethane in excess of the MCL over many years may have an increased risk of getting cancer. |
| 1,1-Dichloroethylene (ppb) | 0.007 | 1000 | 7 | 7 | Discharge from industrial chemical factories | Some people who drink water containing 1,1-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |
| cis-1,2-Dichloroethylene (ppb) | 0.07 | 1000 | 70 | 70 | Discharge from industrial chemical factories | Some people who drink water containing cis-1,2-dichloroethylene in excess of the MCL over many years could experience problems with their liver. |
| trans-1,2-Dichloroethylene (ppb) | 0.1 | 1000 | 100 | 100 | Discharge from industrial chemical factories | Some people who drink water containing trans-1,2-dichloroethylene well in excess of the MCL over many years could experience problems with their liver. |
| Dichloromethane (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from industrial chemical factories | Some people who drink water containing dichloromethane in excess of the MCL over many years could have liver problems and may have an increased risk of getting cancer. |
| 1,2-Dichloropropane (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from industrial chemical factories | Some people who drink water containing 1,2-dichloropropane in excess of the MCL over many years may have an increased risk of getting cancer. |
| Ethyl benzene (ppb) | 0.7 | 1000 | 700 | 700 | Discharge from petroleum refineries; leaching from gasoline storage tanks and landfills | Some people who drink water containing ethyl benzene well in excess of the MCL over many years could experience problems with their liver or kidneys. |
| Styrene (ppb) | 0.1 | 1000 | 100 | 100 | Discharge from rubber and plastic factories; leaching from landfills | Some people who drink water containing styrene well in excess of the MCL over many years could have problems with their liver, kidneys, or circulatory system. |
| Tetrachloroethylene (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from factories and dry cleaners | Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer. |

| Contaminant (CCR units) | MCL, in mg/L | To convert for CCR, multiply by | MCL in CCR units | MCLG in CCR units | Major sources in drinking water | Health effects language |
|------------------------------------|--------------|---------------------------------|------------------|-------------------|---|---|
| 1,2,4-Trichlorobenzene (ppb) | 0.07 | 1000 | 70 | 70 | Discharge from textile-finishing factories | Some people who drink water containing 1,2,4-trichlorobenzene well in excess of the MCL over many years could experience changes in their adrenal glands. |
| 1,1,1-Trichloroethane (ppb) | 0.2 | 1000 | 200 | 200 | Discharge from metal degreasing sites and other factories | Some people who drink water containing 1,1,1-trichloroethane in excess of the MCL over many years could experience problems with their liver, nervous system, or circulatory system. |
| 1,1,2-Trichloroethane (ppb) | 0.005 | 1000 | 5 | 3 | Discharge from industrial chemical factories | Some people who drink water containing 1,1,2-trichloroethane well in excess of the MCL over many years could have problems with their liver, kidneys, or immune system. |
| Trichloroethylene (ppb) | 0.005 | 1000 | 5 | 0 | Discharge from metal degreasing sites and other factories | Some people who drink water containing trichloroethylene in excess of the MCL over many years could experience problems with their liver and may have an increased risk of getting cancer. |
| Total trihalomethanes (TTHM) (ppb) | 0.080 | 1000 | 80 | (footnote 4) | Byproduct of drinking water disinfection | Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous system, and may have an increased risk of getting cancer. |
| Toluene (ppm) | 1 | | 1 | 1 | Discharge from petroleum factories; leaching from gasoline storage tanks and landfills | Some people who drink water containing toluene well in excess of the MCL over many years could have problems with their nervous system, kidneys, or liver. |
| Vinyl chloride (ppb) | 0.002 | 1000 | 2 | 0 | Leaching from PVC piping; discharge from plastics factories | Some people who drink water containing vinyl chloride in excess of the MCL over many years may have an increased risk of getting cancer. |
| Xylenes (ppm) | 10 | | 10 | 10 | Discharge from petroleum factories; discharge from chemical factories; leaching from gasoline storage tanks and landfills | Some people who drink water containing xylenes in excess of the MCL over many years could experience damage to their nervous system. |

¹MCL (for systems that collect >40 samples per month): 5% of monthly samples are positive. MCL (for systems that collect <40 samples per month): 1 positive monthly sample.

²Uranium MCL is effective on December 8, 2003. Until then, there is no MCL.

³Beginning on January 23, 2006, the arsenic MCL is 0.010 mg/L and the MCLG is 0. Until then, the MCL is 0.05 mg/L, and there is no MCLG.

⁴The MCLGs for total trihalomethanes and haloacetic acids:

| Disinfection Byproduct | MCLG, mg/L | MCLG in CCR units |
|------------------------|------------|-------------------|
| Bromodichloromethane | 0 | 0 |
| Bromoform | 0 | 0 |
| Chloroform | 0.07 | 70 |
| Dibromochloromethane | 0.06 | 60 |
| Dichloroacetic acid | 0 | 0 |
| Monochloroacetic acid | 0.07 | 70 |
| Trichloroacetic acid | 0.02 | 20 |

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 12/14/11, effective 5/16/18]

APPENDIX D:
REGULATED CONTAMINANTS TABLES FOR CONSUMER CONFIDENCE REPORTS
Rescinded IAB 1/7/04, effective 2/11/04

APPENDIX E:
HEALTH EFFECTS LANGUAGE FOR CONSUMER CONFIDENCE REPORTS
Rescinded IAB 1/7/04, effective 2/11/04

APPENDIX F:
HEALTH EFFECTS LANGUAGE FOR FLUORIDE LEVELS BETWEEN 2 AND 4 MG/L
Rescinded IAB 1/7/04, effective 2/11/04

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CHAPTER 43
WATER SUPPLIES—DESIGN AND OPERATION
[Prior to 12/12/90, portions of this chapter appeared in 567—Ch 41]

567—43.1(455B) General information.

43.1(1) *Emergency actions regarding water supplies.* When, in the opinion of the director, an actual or imminent hazard exists, the supplier of water shall comply with the directives or orders of the director necessary to eliminate or minimize that hazard.

43.1(2) *Prohibition on the use of lead pipes, solder and flux.* Any pipe, solder or flux which is used in the installation or repair of any public water supply system or any plumbing in a residential or nonresidential facility providing water for human consumption which is connected to a public water supply system shall be lead-free as defined in 567—40.2(455B). This action shall not apply to leaded joints necessary for the repair of cast iron pipe.

43.1(3) *Use of noncentralized treatment devices.*

a. Community PWS. Community public water systems shall not use bottled water, point-of-use (POU) or point-of-entry (POE) devices to achieve permanent compliance with a maximum contaminant level, action level, or treatment technique requirement in 567—Chapters 41 and 43.

b. Noncommunity PWS. Noncommunity public water supply systems may be allowed by the department to use point-of-use devices to achieve MCL compliance provided the contaminant does not pose an imminent threat to health (such as bacteria) nor place a sensitive population at risk (such as infants for nitrate or nitrite).

c. Reduced monitoring requirements. Bottled water, point-of-use, or point-of-entry devices cannot be used to avoid the monitoring requirements of 567—Chapters 41 and 43, but the department may allow reduced monitoring requirements in specific instances.

d. Bottled water requirements. The department may require a public water system exceeding a maximum contaminant level, action level, or treatment technique requirement specified in 567—Chapters 41 and 43 to use bottled water as a condition of an interim compliance schedule or as a temporary measure to avoid an unreasonable risk to health. Any bottled water must, at a minimum, meet the federal Food and Drug Administration bottled water standards, listed in the Code of Federal Regulations, Title 21, Chapter 165.110. The system must meet the following requirements:

(1) *Monitoring program.* Submit for approval to the department a monitoring program for bottled water. The monitoring program must provide reasonable assurances that the bottled water complies with all maximum contaminant levels, action levels, or treatment technique requirements in 567—Chapters 41 and 43. The public water system must monitor a representative sample of bottled water for all contaminants regulated under 567—Chapters 41 and 43 the first quarter that it supplies the bottled water to the public, and annually thereafter. Results of the monitoring program shall be provided to the department annually. If the bottled water is from a community public water system that currently meets all of the federal Safe Drinking Water Act requirements, the monitoring requirements of this subparagraph shall be waived by the department. The specific supplier of the bottled water must be identified in order for the department to waive the monitoring requirements.

(2) *Certification requirements.* The public water system must receive a certification from the bottled water company that the bottled water supplied has been taken from an “approved source”; the bottled water company has conducted monitoring in accordance with 43.1(3)“b”(1); and the bottled water meets MCLs, action levels, or treatment technique requirements as set out in 567—Chapters 41 and 43. The public water system shall provide the certification to the department the first quarter after it supplies bottled water and annually thereafter.

(3) *Provision of bottled water to consumers.* The public water supply system is fully responsible for the provision of sufficient quantities of bottled water to every person supplied by the public water system via door-to-door bottled water delivery.

e. Point-of-use devices. Reserved.

f. Point-of-entry devices. Reserved.

43.1(4) Cross-connection control. To prevent backflow or backsiphonage of contaminants into a public water supply, connection shall not be permitted between a public water supply and any other system which does not meet the monitoring and drinking water standards required by this chapter except as provided below in “a” or “b.”

a. Piping and plumbing systems. Piping systems or plumbing equipment carrying nonpotable water, contaminated water, stagnant water, liquids, mixtures or waste mixtures shall not be connected to a public water supply unless properly equipped with an antisiphon device or backflow preventer acceptable to the department.

b. Bulk water loading stations. Positive separation shall be provided through the use of an air gap separation or a backflow preventer, which is acceptable to the department, at all loading stations for bulk transport tanks.

(1) Minimum air gap. The minimum required air gap shall be twice the diameter of the discharge pipe.

(2) Backflow preventer criteria. An approved backflow preventer for this application shall be a reduced pressure backflow preventer or an antisiphon device which complies with the standards of the American Water Works Association and has been approved by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California.

When, in the opinion of the department, evidence clearly indicates the source of contamination within the system is the result of a cross-connection, the department may require a public water supply to conduct public notification, identify and eliminate the connection, and implement a systemwide cross-connection program.

43.1(5) Requirement for certified operator. The department maintains a list of operators who are certified in accordance with 567—Chapter 81. The list includes the operator’s name, certification classification (Water Treatment, Water Distribution, or Grade A Water System), and grade (A, I, II, III, or IV), and is periodically updated during the year.

a. CWS and NTNC systems. All community and nontransient noncommunity public water supply systems must have a certified operator in direct responsible charge of the treatment and distribution systems, in accordance with 567—Chapters 40 through 44 and 81.

b. TNC systems. Any transient noncommunity public water supply system which is owned by the state or federal government, such as a state park, state hospital, or interstate rest stop, or is using a groundwater under the direct influence of surface water or surface water source, must have a certified operator in direct responsible charge of the treatment and distribution systems, in accordance with 567—Chapters 40 through 44 and 81. Any TNC which uses chlorine dioxide as a disinfectant or oxidant must have a certified operator in direct responsible charge of the system, pursuant to 567—Chapter 81. The department may require any TNC to have a certified operator in direct responsible charge.

43.1(6) Return water in public water supply systems. Steam condensate, cooling water from engine jackets, water used in conjunction with heat exchange devices, or treated wastewater shall not be returned to the public water supply system.

43.1(7) Sanitary surveys. Each public water supply system must have a periodic sanitary survey, conducted by the department or its designee, which is a records review and on-site inspection of the system. Systems must provide the department, at its request, any existing information that will enable the department to conduct the sanitary survey. The inspection evaluates the system’s ability to produce and distribute safe drinking water and identifies improvements necessary to maintain or improve drinking water quality. The sanitary survey includes review and inspection of the following areas: water source; treatment facilities; distribution system; finished water storage; pumps, pump facilities, controls and other equipment; monitoring, reporting, and data verification, including self-monitoring requirements; system operation and management; maintenance; properly certified operators; and records. A report of the sanitary survey is issued by the department or its designee, and may include both enforceable required actions for remedying significant deficiencies and nonenforceable recommended actions. The frequency of the sanitary survey inspection must be at least once every five years for noncommunity systems and once every three years for community systems. The department or its designee must provide

the system with a written notice describing any significant deficiencies identified no later than 30 days after the department identifies the significant deficiency. The notice may be included in the sanitary survey report and may specify corrective actions and deadlines for completion of corrective actions. Systems must respond in writing to significant deficiencies outlined in the sanitary survey report or written notice within the time period specified in the report, indicating how and on what schedule the system will address significant deficiencies noted in the survey. At a maximum, the written response must be received within 30 days of receiving the survey report. All systems must take the steps necessary to address significant deficiencies identified in the sanitary survey report that are within the control of the system and its governing body.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.2(455B) Permit to operate.

43.2(1) Operation fees.

a. Annual fee. A fee for the operation of a public water supply system shall be paid annually. The fee will not be prorated and is nonrefundable. The fee shall be based on the population served. The fee shall be the greater of \$25 per year or \$0.14 multiplied by the total population served by the public water supply for all community and nontransient noncommunity public water supply systems. The fee shall be \$25 per year for all transient noncommunity water systems. Where a system provides water to another public water supply system (consecutive public water supply system) which is required to have an operation permit, the population of the recipient water supply shall not be counted as a part of the water system providing the water.

b. Fee notices. The department will send annual notices to public water supply systems at least 60 days prior to the date that the operation fee is due.

c. Fee payments. The annual operation fee must be paid to the department by September 1 each year.

d. Fee schedule adjustment. The department may adjust the per capita fee payment by up to +/- \$0.02 per person served so as to achieve the targeted revenue of \$350,000 during each fiscal year. The environmental protection commission must approve any per capita fee rate above \$0.14 per person. The extent of the fee adjustment must comply with Iowa Code section 455B.183A.

e. Exempted public water supply systems. Public water supply systems located on Indian lands are exempt from the fee requirements.

f. Late fees. When the owner of a public water supply fails to make timely application or to remit payment of fees by September 1, the department will notify the system by a single notice of violation. In addition, a late fee of \$100 will be assessed for failure to remit the operation fee by September 1. The department may thereafter issue an administrative order pursuant to Iowa Code section 455B.175(1) or request a referral to the attorney general under Iowa Code section 455B.175(3) as necessary.

43.2(2) Operation permit requirement. Except as provided in 43.2(3) and 43.2(4), no person shall operate any public water supply system or part thereof without, or contrary to any condition of, an operation permit issued by the director.

43.2(3) Application for operation permit. The owner of any public water supply system or part thereof must make application for an operation permit. No such system shall be operated without an operation permit, unless proper application has been made. Upon submission of a completed application form, the time requirement for having a valid operation permit is automatically extended until the application has either been approved or disapproved by the director.

43.2(4) Operation permit application form issuance.

a. Operation permit application form. Application for operation permits shall be made on forms provided by the department. The application for an operation permit shall be filed at least 90 days prior to the date operation is scheduled to begin unless a shorter time is approved by the director. The director shall issue or deny operation permits for facilities within 60 days of receipt of a completed application, unless a longer period is required and the applicant is so notified. The director may require the submission of additional information deemed necessary to evaluate the application. If the application

is incomplete or otherwise deficient, processing of the application shall not be completed until such time as the applicant has supplied the missing information or otherwise corrected the deficiency.

b. Identity of signatories of operation permit applications. The person who signs the application for an operation permit shall be:

(1) Corporation. In the case of a corporation, a principal executive officer of at least the level of vice president. The corporation has the option of appointing a designated signatory to satisfy this requirement.

(2) Partnership. In the case of a partnership, a general partner.

(3) Sole proprietorship. In the case of a sole proprietorship, the proprietor.

(4) Public facility. In the case of a municipal, state or other public facility, by either the principal executive officer or the ranking elected official.

c. Appeal. The denial of a permit, or any permit condition, may be appealed by the applicant to the environmental protection commission pursuant to 567—Chapter 7.

43.2(5) Operation permit conditions.

a. Operation permit conditions. Operation permits may contain such conditions as are deemed necessary by the director to ensure compliance with all applicable rules of the department, to ensure that the public water supply system is properly operated and maintained, to ensure that potential hazards to the water consumer are eliminated promptly, and to ensure that the requirements of the Safe Drinking Water Act are met.

b. Compliance schedule. Where one or more maximum contaminant levels, treatment techniques, designated health advisories, or action levels cannot be met immediately, a compliance schedule for achieving compliance with standards may be made a condition of the permit. A compliance schedule requiring alterations in accordance with the standards for construction in 43.3(1) and 43.3(2) may also be included for any supply that, in the opinion of the director, contains a potential hazard.

c. Treatment. If the department determines that a treatment method identified in 43.3(10) is technically feasible, the department may require the system to install or use that treatment method in connection with a compliance schedule issued under the provisions of 43.2(5)“b.” The department’s determination shall be based upon studies by the system and other relevant information.

43.2(6) Notification of change in operation permit application conditions. The owner of a public water supply system shall notify the director within 30 days of any change in conditions identified in the permit application. This notice does not relieve the owner of the responsibility to obtain a construction permit as required by 567—43.3(455B).

43.2(7) Renewal of operation permits. The department may issue operation permits for durations of up to five years. Operation permits must be renewed prior to expiration in order to remain valid. The renewal date shall be specified in the permit or in any renewal. Application for renewal must be received by the director, or postmarked, 60 days prior to the renewal date, on forms provided by the department.

43.2(8) Denial, modification, or suspension of operation permit. The director may deny renewal of, modify, or suspend, in whole or in part, any operation permit for good cause. Denial of a new permit, renewal of an existing permit, or modification of a permit, may be appealed to the environmental protection commission pursuant to 567—Chapter 7. Suspension or revocation may occur after hearing, pursuant to 567—Chapter 7. Good cause includes the following:

a. Violation of any term or condition of the permit.

b. Obtaining a permit by misrepresentation of fact or failure to disclose fully all material facts.

c. A change in any condition that requires either a permanent or temporary modification of a permit condition.

d. Failure to submit such records and information as the director may require both generally and as a condition of the operation permit in order to ensure compliance with conditions specified in the permit.

e. Violation of any of the requirements contained in 567—Chapters 40 to 43.

f. Inability of a system to either achieve or maintain technical, managerial, or financial viability, as determined in rule 567—43.8(455B).

567—43.3(455B) Public water supply system construction.

43.3(1) Standards for public water supplies. Any public water supply that does not meet the drinking water standards contained in 567—Chapters 41 and 43 shall make the alterations in accordance with the standards for construction contained in 43.3(2) necessary to comply with the drinking water standards unless the public water supply has been granted a variance from a maximum contaminant level or treatment technique as a provision of its operation permit pursuant to 567—43.2(455B), provided that the public water supply meets the schedule established pursuant to 567—43.2(455B). Any public water supply that, in the opinion of the director, contains a potential hazard shall make the alterations in accordance with the standards for construction contained in this rule necessary to eliminate or minimize that hazard. A system that is not operating within the design standards may be required by the department via a compliance schedule to upgrade the deficient areas of the system before a construction permit will be issued for any work in the system that does not address the current deficiencies.

43.3(2) Standards for construction.

a. The standards for a project are the Ten States Standards as adopted through 2012 and the American Water Works Association (AWWA) Standards as adopted through 2016 and 43.3(7) to 43.3(9). To the extent of any conflict between the Ten States Standards and the American Water Works Association Standards and 43.3(7) to 43.3(9), the Ten States Standards, 43.3(2), and 43.3(7) to 43.3(9) shall prevail. Additional standards include the following:

(1) Polyvinyl chloride (PVC) pipe manufactured in accordance with ASTM D2241, AWWA C900, AWWA C905, ASTM F1483, or AWWA C909 may be used for water main construction. The maximum allowable pressure for PVC or polyethylene (PE) pipe shall be determined based on a safety factor of 2.0 and a surge allowance of no less than two feet per second (2 fps).

(2) For CWS groundwater systems, a minimum of two wells shall be provided, unless the system demonstrates to the department's satisfaction that a single well will provide a reliable and adequate source. For NTNC and TNC groundwater systems, a single well is acceptable.

(3) Separation of water mains from sanitary sewers and storm sewers shall be in accordance with the Iowa Wastewater Facilities Design Standards, chapter 12, section 5.8, "Protection of Water Supplies." Where the water main either crosses under or is less than 18 inches above the sewer, one full length of water main shall be located so that both joints are as far as possible from the sewer. The sewer and water pipes must be adequately supported. A low permeability soil shall be used for backfilling material within ten feet of the point of crossing. No water pipe shall pass through or come in contact with any part of a sewer manhole.

b. Variance. When engineering justification satisfactory to the director is provided substantially demonstrating that variation from the design standards will result in equivalent or improved effectiveness, such a variation from design standards may be accepted by the director. A variance denial may be appealed to the environmental protection commission pursuant to 567—Chapter 7. Variance requests for projects qualifying for a waiver from the engineering requirement of 43.3(4) may be made without the retained services of a professional engineer.

43.3(3) Construction permits. No person shall construct, install or modify any project without first obtaining, or contrary to any condition of, a construction permit issued by the director or by a local public works department authorized to issue permits under 567—Chapter 9 except as provided in 43.3(3) "b," 43.3(4) and 43.3(6). Construction permits are not required for point-of-use treatment devices installed by a noncommunity water system except those devices required by the department to meet a drinking water standard pursuant to 567—Chapters 41 and 43. No construction permit will be issued for a new public water supply system without a completed viability assessment, which has been approved by the department, and demonstrates that the system is viable, pursuant to 567—43.8(455B).

a. **Construction permit issuance conditions.** A permit to construct shall be issued by the director if the director concludes from the application and specifications submitted pursuant to 43.3(4) and 567—40.4(455B) that the project will comply with the rules of the department. The construction of the project must begin within one year from the date the permit was issued; if it is not, the permit is no longer valid. If construction is ongoing and continuous (aside from delays due to winter or exceptional weather) and the permitted project cannot be completed within one year, the permit shall remain valid

until the project is completed. The department may grant an extension of the permit for a multiphase project, for a maximum two additional years.

b. Construction permit application. Application for any project shall be submitted to the department at least 30 days prior to the proposed date for commencing construction or awarding of contracts. This requirement may be waived when it is determined by the department that an imminent health hazard exists to the consumers of a public water supply. Under this waiver, construction, installation, or modification may be allowed by the department prior to review and issuance of a permit if all the following conditions are met:

- (1) The construction, installation or modification will alleviate the health hazard;
- (2) The construction is done in accordance with the standards for construction pursuant to 43.3(2);
- (3) Plans and specifications are submitted within 30 days after construction;
- (4) A professional engineer, licensed in the state of Iowa, supervises the construction; and
- (5) The supplier of water receives approval of this waiver prior to any construction, installation, or modification.

c. Construction permit fees. A nonrefundable fee for a construction permit issued in accordance with subrules 43.3(3) and 43.3(4) and 567—subrules 40.3(1) and 40.4(1) shall be submitted with the application for a construction permit prior to the authorization to commence construction. The construction permit fee shall be based upon the following rate structure:

(1) Routine construction permits. The fee shall be determined based upon the total length of water main plus the non-water-main-related construction costs, calculated as follows:

1. Water mains (minimum fee of \$100; maximum fee of \$5,000):

| Length of permitted water main | Rate |
|--------------------------------|----------------------|
| First 1,000 ft. | \$100 |
| Next 19,000 ft. | \$0.10/ft. |
| Next 300,000 ft. | \$0.01/ft. |
| Over 320,000 ft. | No additional charge |

2. Non-water-main-related construction costs, including source, treatment, pumping, storage and waste handling (minimum fee of \$100; maximum fee of \$16,000):

| Estimated construction cost | Rate |
|-----------------------------|-------------------------------------|
| First \$50,000 | \$100 |
| Next \$950,000 | 0.2% of estimated construction cost |
| Next \$14,000,000 | 0.1% of estimated construction cost |
| Over \$15,000,000 | No additional charge |

(2) “As-built” construction. “As-built” construction is defined as construction that occurred before a construction permit is issued. The fee shall be calculated according to 43.3(3) “c”(1), plus an additional fee of \$200, and is effective for construction that occurred after December 1, 2003. The fee for water main projects permitted in accordance with paragraph 43.3(3) “e” shall be calculated in accordance with subparagraph 43.3(3) “c”(1); however, the additional “as-built” fee of \$200 shall not be assessed for these projects.

(3) Change orders, addenda, permit supplements, and request for time extensions. A fee for change orders, addenda, or permit supplements will only be charged if the aggregate of the changes approved for the project to date causes the total project construction cost to exceed the original project construction cost by at least 5 percent. For water main extensions, the fee will be charged if the total length of water main exceeds the original approved length by 5 percent. The request for a time extension is a flat fee.

| Categories | Rate |
|--|---|
| Change orders, addenda, and permit supplements for water mains | \$0.10/ft. of additional water main, minimum fee: \$50 |
| Change orders, addenda, and permit supplements for non-water-main-related construction costs | 0.2% of additional non-water-main-related construction costs, minimum fee: \$50 |
| Request for time extension | \$50 |

(4) Calendar year construction permit fee cap. The total amount of construction permit fees for a public water supply system owner during any calendar year shall not exceed \$5,000 for water mains and \$16,000 for non-water-main-related construction projects.

d. Water well construction. All water well construction must be performed by a certified well contractor in accordance with 567—Chapter 82. It is the responsibility of the public water supply and certified well contractor to ensure that a public well construction permit has been issued by the department prior to initiation of well construction and to ensure that all well construction is performed in accordance with the provisions of this chapter.

e. Minor water main construction permit. A public water system may obtain a minor water main construction permit from the department for construction or replacement of minor water mains that serve additional users. By obtaining this permit, the system is able to construct new minor water mains or extend or replace existing minor water mains without obtaining an individual construction permit for each specific water main. The permit shall allow construction or replacement of minor water mains that do not exceed six inches in diameter and, in aggregation, do not increase the average daily demand (in gallons per day) of the public water supply system by more than 5 percent over the duration of the permit.

The additional users must have been included in the system's hydraulic analysis that has been approved by the department. The water demands of the additional users must be consistent with the water demands in the approved hydraulic analysis.

(1) A minor water main construction permit shall be issued subject to the following conditions:

1. The system has standard specifications for water main construction approved and on file with the department;

2. The system has adequate source capacity and, where treatment is provided, adequate treatment plant capacity to meet the peak day demand of all existing users and the proposed additional users covered under the permit;

3. The system has adequate storage capacity to meet the average day demand of all existing users and the proposed additional users covered under the permit; and

4. The system submits an application for a minor water main construction permit prior to the construction or replacement of any water main covered by the permit. The permit application must be submitted to the department 90 days before the anticipated first use of the permit, and construction shall not commence prior to the issuance of the permit. The minor water main construction permit expires on December 31 of the year in which it is issued. The application shall include the following:

- An up-to-date hydraulic analysis of the system, prepared and submitted by a licensed professional engineer, must be either on file with the department or submitted with the permit application. The hydraulic basis of flow (gallons per minute per connection) used in the analysis must be acceptable to the department. The hydraulic analysis shall include:

- All existing water mains within the system;

- All proposed water mains intended to be covered by the permit;

- A demonstration that the system has adequate hydraulic capacity to serve the existing and new users under peak flow conditions without causing the pressure to fall below 20 psi anywhere within the system;

- The location of all potential users of the system;

- The diameter of all existing and proposed pipes;

- The projected system flows; and

◦ The static and dynamic pressures anticipated throughout the system with the addition of the new users incorporated in the analysis.

● A completed Schedule 1b, Minor Water Main Construction Permit Application (Form 542-3151), listed in 567—subrule 40.3(1).

(2) The system must submit completed Schedule 2c, Notification of Minor Water Main Construction (Form 542-3152), prior to the construction or replacement of each minor water main covered by this permit. Each water main covered by the permit must have either been included in the previously submitted hydraulic analysis or must be included in an update to the hydraulic analysis, submitted with Schedule 2c. If an update to the hydraulic analysis is submitted with Schedule 2c, it must include all portions of the distribution system potentially affected by the new construction.

(3) By January 31 of the following year, the system shall submit the following to the department:

1. A complete set of plans for all water main extensions constructed under the permit. The plans must be prepared and submitted by a licensed professional engineer.

2. Completed Schedules 1a, 1c, and 2a, listed in 567—subrule 40.3(1).

3. The construction permit fee calculated in accordance with subparagraph 43.3(3)“c”(1). The fee calculation shall be based upon the total length of water main constructed under the permit. For the purpose of calculating the total amount of water main construction permit fees, paid by the system in accordance with subparagraph 43.3(3)“c”(4), the fee shall be credited to the calendar year in which the actual fee was received by the department.

(4) A permit shall contain such conditions as are deemed necessary by the director to ensure compliance with all applicable rules of the department.

(5) The director may modify the permit, in whole or in part, at any time. The director may suspend or revoke the permit, in whole or in part, at any time by providing written notice to the permit holder and is not obligated to renew the permit. Cause for modification, suspension, or revocation of the permit includes, but is not limited to, the following:

1. Violation of any term or condition of the permit;

2. Misrepresentation of fact or failure to disclose fully all material facts in order to obtain a permit;

3. Failure to submit the records and information as required by the director, both generally and as condition of the permit;

4. Failure to submit timely reports from previous permits;

5. Failure to construct in accordance with approved design standards in accordance with subrule 43.3(2); or

6. Failure to construct in accordance with the system’s approved standard specifications.

(6) No variance to the design standards is allowed under this permit. If a variance to the design standards is needed, the system must apply for an individual construction permit following the procedures in 567—subrule 40.4(1).

43.3(4) Waiver from engineering requirements. The requirement for plans and specifications prepared by a licensed professional engineer may be waived for the following types of projects, provided the improvement complies with the standards for construction. This waiver does not relieve the supplier of water from meeting the application and permit requirements pursuant to 43.3(3), except that the applicant need not obtain a written permit prior to installing the equipment.

a. Simple chemical feed, if all the following conditions are met:

(1) The improvement consists only of a simple chemical solution application or installation, which in no way affects the performance of a larger treatment process, or is included as part of a larger treatment project;

(2) The chemical application is by a positive displacement pump (of the piston type with a solenoid operated diaphragm), the acceptability of said pump to be determined by the department;

(3) The supplier of water provides the department with a schematic of the installation and manufacturer’s specifications sufficient enough to determine if the simple chemical feed installation meets, where applicable, standards for construction pursuant to 43.3(2);

(4) The final installation is approved based on an on-site review and inspection by department staff; and

(5) The installation includes only the prepackaged delivery of chemicals (from sacks, containers, or carboys) and does not include the bulk storage or transfer of chemicals (from a delivery vehicle).

b. Self-contained treatment unit, if all the following conditions are met:

(1) The equipment is of a type which can be purchased “off the shelf,” is self-contained requiring only a piping hookup for installation and operates throughout a range of 35 to 80 pounds per square inch;

(2) The plant is designed to serve no more than an average of 250 individuals per day;

(3) The department receives adequate information from the supplier of water on the type of treatment unit, such as manufacturer’s specifications, a schematic indicating the installation’s location within the system and any other information necessary for review by the department to determine if the installation will alleviate the maximum contaminant level violation; and

(4) The final installation is approved based on an on-site inspection by department staff.

43.3(5) *Project planning and basis of design.* An engineering report containing information and data necessary to determine the conformance of the project to the standards for construction and operation in 43.3(2) and the adequacy of the project to supply water in sufficient quantity and at sufficient pressure and of a quality that complies with drinking water standards pursuant to 567—Chapters 41 and 43 must be submitted to the department either with the project or in advance.

a. Such information and data must supply pertinent information as set forth in part one of the Ten States Standards.

b. The department may reject receipt or delay review of the plans and specifications until an adequate basis of design is received.

43.3(6) *Standard specifications for water main construction.* Standard specifications for water main construction by an entity may be submitted to the department or an authorized local public works department for approval. Such approval shall apply to all future water main construction by or for that entity for which plans are submitted with a statement requiring construction in accordance with all applicable approved standard specifications unless the standards for public water supply systems specified in 43.3(2) are modified subsequent to such approval and the standard specifications would not be approvable under the modified standards. In those cases where such approved specifications are on file, construction may commence 30 days following receipt of such plans by the department or an authorized local public works department if no response has been received indicating construction shall not commence until a permit is issued.

43.3(7) *Site, separation distance, and monitoring requirements for new raw water source(s) and underground finished water storage facilities.*

a. Approval required. The site for each proposed raw water supply source or finished water below-ground level storage facility must be approved by the department prior to the submission of plans and specifications.

b. Criteria for approval. A site may be approved by the director if the director concludes that the criteria in this paragraph are met.

(1) Groundwater source. Wells shall be planned and constructed to adapt to the geologic and groundwater conditions of the proposed well site to ensure production of water from the wells that is both microbially safe and free of substances that could cause harmful human health effects. Groundwater wells must meet the following requirements:

1. Drainage must be directed away from the well in all directions for a minimum radius of 15 feet.

2. A well site must be separated from contamination sources by the distances specified in Table A at a minimum.

3. After the well site has received preliminary approval from the department, the owner of the proposed well must submit proof of legal control of the land for a 200-foot radius around the well, through purchase, lease, easement, ordinance, or other similar means. Proof of legal control must be submitted as part of the construction permit application, prior to construction. The legal control must be maintained by the public water system for the life of the well, and the system must ensure that the siting criteria indicated in Table A are met.

However, if the proposed well is for an existing noncommunity water system and is replacing an existing well that either does not meet the current standards or is in poor condition, the requirement of 200-foot legal control may be waived by the department provided that:

- The proposed well is located on the best available site;
- The existing facility does not have adequate land to provide the 200-foot control zone;
- The owner has attempted to obtain legal control without success; and
- There is no other public water supply available to which the supply could connect.

4. When the proposed well is located in an existing well field and will withdraw water from the same aquifer as the existing well(s), individual separation distances may be waived if substantial historical data are available indicating that no contamination has resulted.

5. No well shall be constructed within the projected plume of any known anthropogenic groundwater contamination without the department's written approval. The department may allow a well to be constructed within a contamination plume if the applicant can provide adequate treatment to ensure that all drinking water standards are met and that the pumpage of the proposed well will not cause migration of the plume such that it impacts the water quality of other nearby wells. The applicant must demonstrate, using a hydrogeologic model acceptable to the department, that the time of transport is greater than two years for a viral, bacterial, or other microorganism contaminant and greater than ten years for all chemical contaminants. At a minimum, modeling of the projected plume must take into account the proposed pumpage rate of the well. The department may require additional construction standards for these situations to ensure protection of the groundwater from contamination.

6. The department may require that an identification tag be applied to each well and may supply the numbered tag. The responsibility for ensuring that the tag is properly attached to the well is with the certified water well contractor for new wells and with the department for existing wells.

(2) Surface water source. The applicant must submit proof that a proposed surface water source can, through readily available treatment methodology, comply with 567—Chapters 41 and 43, and that the raw water source is adequately protected against potential health hazards including, but not limited to, point source discharges, hazardous chemical spills, and the potential sources of contamination listed in Table A.

After a surface water impoundment has received preliminary approval from the department for use as a raw water source, the owner of the water supply system shall submit proof of legal control through ownership, lease, easement, or other similar means, of contiguous land for a distance of 400 feet from the shoreline at the maximum water level. Legal control shall be for the life of the impoundment and shall control location of sources of contamination within the 400-foot distance. Proof of legal control should be submitted as part of the construction permit application and shall be submitted prior to issuance of a permit to construct.

(3) Below-ground storage facilities. The minimum separation between a below-ground level finished water storage facility and any source of contamination listed in Table A as being 50 feet or more shall be 50 feet. The specific separation distances listed in Table A that are less than 50 feet shall apply to a below-ground level finished water storage facility as indicated in the table.

(4) Separation distances. Greater separation distances may be required where necessary to ensure that no adverse effects to water supplies or the existing environment will result. Lesser separation distances may be considered if detailed justification is provided by the applicant's engineer showing that no adverse effects will result from a lesser separation distance, and the regional staff recommends approval of the lesser distance. Such exceptions must be based on special construction techniques or localized geologic or hydrologic conditions.

c. New source water monitoring requirements. Water quality monitoring shall be conducted on all new water sources and results submitted to the department prior to placing the new water source into service.

(1) All sources. Water samples shall be collected from each new water source and analyzed for all appropriate contaminants as specified in 567—Chapter 41 consistent with the particular water system classification. If multiple new sources are being added, compositing of the samples (within a single system) shall be allowed in accordance with the composite sampling requirements outlined

in 567—Chapter 41. A single sample may be allowed to meet this requirement, if approved by the department.

Subsequent water testing shall be conducted consistent with the water system's water supply operation permit monitoring schedule.

(2) Groundwater sources. Water samples collected from groundwater sources in accordance with 43.3(7) "c"(1) shall be conducted at the conclusion of the drawdown/yield test pumping procedure, with the exception of bacteriological monitoring. Bacteriological monitoring must be conducted after disinfection of each new well and subsequent pumping of the chlorinated water to waste. Water samples must be analyzed for ammonia. Water samples should also be analyzed for alkalinity, pH, calcium, chloride, copper, hardness, iron, magnesium, manganese, potassium, silica, specific conductance, sodium, sulfate, filterable and nonfilterable solids, and zinc.

(3) Surface water sources. Water samples collected from surface water sources in accordance with 43.3(7) "c"(1) should be collected prior to the design of the surface water treatment facility and shall be conducted and analyzed prior to utilization of the source. The samples shall be collected during June, July, and August. In addition, quarterly monitoring shall be conducted in March, June, September, and December at a location representative of the raw water at its point of withdrawal. Monitoring shall be for turbidity, alkalinity, pH, calcium, chloride, color, copper, hardness, iron, magnesium, manganese, potassium, silica, specific conductance, sodium, sulfate, filterable and nonfilterable solids, carbonate, bicarbonate, algae (qualitative and quantitative), total organic carbon, five-day biochemical oxygen demand, dissolved oxygen, surfactants, nitrogen series (organic, ammonia, nitrite, and nitrate), and phosphate.

TABLE A: SEPARATION DISTANCES

| SOURCE OF CONTAMINATION | REQUIRED MINIMUM LATERAL DISTANCE FROM WELL AS HORIZONTAL ON THE GROUND SURFACE, IN FEET | |
|--|---|--|
| | Deep Well ¹ | Shallow Well ¹ |
| WASTEWATER STRUCTURES: | | |
| Point of Discharge to Ground Surface | | |
| Sanitary & industrial discharges | 400 | 400 |
| Water treatment plant wastes | 50 | 50 |
| Well house floor drains | 5 | 5 |
| Sewers & Drains ² | | |
| Sanitary & storm sewers, drains | 0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer pipe | 0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer main pipe |
| Sewer force mains | 0 – 75 feet: prohibited 75 – 400 feet if water main pipe 400 – 1000 feet if sanitary sewer pipe | 0 – 75 feet: prohibited 75 – 400 feet if water main pipe 400 – 1000 feet if sanitary sewer main pipe |
| Water plant treatment process wastes that are treated onsite | 0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer pipe | 0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer main pipe |
| Water plant wastes to sanitary sewer | 0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer pipe | 0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer main pipe |
| Well house floor drains to sewers | 0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer pipe | 0 – 25 feet: prohibited 25 – 75 feet if water main pipe 75 – 200 feet if sanitary sewer main pipe |
| Well house floor drains to surface | 0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer pipe | 0 – 5 feet: prohibited 5 – 50 feet if sanitary sewer main pipe |

| SOURCE OF CONTAMINATION | REQUIRED MINIMUM LATERAL DISTANCE FROM WELL AS HORIZONTAL ON THE GROUND SURFACE, IN FEET | |
|---|--|---------------------------|
| | Deep Well ¹ | Shallow Well ¹ |
| Land Disposal of Treated Wastes | | |
| Irrigation of wastewater | 200 | 400 |
| Land application of solid wastes ³ | 200 | 400 |
| Other | | |
| Cesspools & earth pit privies | 200 | 400 |
| Concrete vaults & septic tanks | 100 | 200 |
| Lagoons | 400 | 1000 |
| Mechanical wastewater treatment plants | 200 | 400 |
| Soil absorption fields | 200 | 400 |
| CHEMICALS: | | |
| Chemical application to ground surface | 100 | 200 |
| Chemical & mineral storage above ground | 100 | 200 |
| Chemical & mineral storage on or under ground | 200 | 400 |
| Transmission pipelines (such as fertilizer, liquid petroleum, or anhydrous ammonia) | 200 | 400 |
| ANIMALS: | | |
| Animal pasturage | 50 | 50 |
| Animal enclosure | 200 | 400 |
| Earthen silage storage trench or pit | 100 | 200 |
| Animal Wastes | | |
| Land application of liquid or slurry | 200 | 400 |
| Land application of solids | 200 | 400 |
| Solids stockpile | 200 | 400 |
| Storage basin or lagoon | 400 | 1000 |
| Storage tank | 200 | 400 |
| MISCELLANEOUS: | | |
| Basements, pits, sumps | 10 | 10 |
| Cemeteries | 200 | 200 |
| Cisterns | 50 | 100 |
| Flowing streams or other surface water bodies | 50 | 50 |
| GHEX loop boreholes | 200 | 200 |
| Railroads | 100 | 200 |
| Private wells | 200 | 400 |
| Solid waste landfills and disposal sites ⁴ | 1000 | 1000 |

¹Deep and shallow wells, as defined in 567—40.2(455B): A deep well is a well located and constructed in such a manner that there is a continuous layer of low permeability soil or rock at least 5 feet thick located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn. A shallow well is a well located and constructed in such a manner that there is not a continuous layer of low permeability soil or rock (or equivalent retarding mechanism acceptable to the department) at least 5 feet thick, the top of which is located at least 25 feet below the normal ground surface and above the aquifer from which water is to be drawn.

²The separation distances are dependent upon two factors: the type of piping that is in the existing sewer or drain, as noted in the table, and that the piping was properly installed in accordance with the standards.

³Solid wastes are those derived from the treatment of water or wastewater. Certain types of solid wastes from water treatment processes may be land-applied within the separation distance on an individual, case-by-case basis.

⁴Solid waste means garbage, refuse, rubbish, and other similar discarded solid or semisolid materials, including but not limited to such materials resulting from industrial, commercial, agricultural, and domestic activities.

43.3(8) Drinking water system components. Any drinking water system component which comes into contact with raw, partially treated, or finished water must be suitable for the intended use in a potable water system. The component must be certified by an American National Standards Institute (ANSI) accredited third party for conformance with American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 61 specifications, if such specification exists for the particular product, unless approved components are not reasonably available for use, in accordance with guidance provided by the department. If the component does not meet the ANSI/NSF Standard 61 specifications or no specification is available, the person seeking to supply or use the component must prove to the satisfaction of the department that the component is not toxic or otherwise a potential hazard in a potable public water supply system.

43.3(9) Water treatment filter media material. For single media filters, grain sizes up to 0.8 mm effective size may be approved for filters designed to remove constituents other than those contained in the primary drinking water standards. Pilot or full-scale studies demonstrating satisfactory treatment efficiency and operation with the proposed media will be required prior to issuing any construction permits which allow filter media sizes greater than 0.55 mm.

43.3(10) Best available treatment technology.

a. BATs for organic compounds. The department identifies as indicated in the table below either granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OXID) as the best available technology, treatment technique, or other means available for achieving compliance with the maximum contaminant level for organic contaminants identified in 567—paragraph 41.5(1) “b.” For the purposes of setting MCLs for synthetic organic chemicals, any BAT must be at least as effective as granular activated carbon.

| ORGANIC CONTAMINANT | GAC | PTA | OXID |
|-----------------------------|-----|-----|------|
| Alachlor | x | | |
| Aldicarb | x | | |
| Aldicarb sulfone | x | | |
| Aldicarb sulfoxide | x | | |
| Atrazine | x | | |
| Benzene | x | x | |
| Benzo(a)pyrene | x | | |
| Carbofuran | x | | |
| Carbon tetrachloride | x | x | |
| Chlordane | x | | |
| 2,4-D | x | | |
| Dalapon | x | | |
| Dibromochloropropane (DBCP) | x | x | |
| o-Dichlorobenzene | x | x | |
| p-Dichlorobenzene | x | x | |
| 1,2-Dichloroethane | x | x | |
| cis-1,2-Dichloroethylene | x | x | |
| trans-1,2-Dichloroethylene | x | x | |
| 1,1-Dichloroethylene | x | x | |

| ORGANIC CONTAMINANT | GAC | PTA | OXID |
|---------------------------------|-----|-----|------|
| Dichloromethane | | x | |
| 1,2-Dichloropropane | x | x | |
| Di(2-ethylhexyl)adipate | x | x | |
| Di(2-ethylhexyl)phthalate | x | | |
| Dinoseb | x | | |
| Diquat | x | | |
| Endothall | x | | |
| Endrin | x | | |
| Ethylene dibromide (EDB) | x | x | |
| Ethylbenzene | x | x | |
| Glyphosate | | | x |
| Heptachlor | x | | |
| Heptachlor epoxide | x | | |
| Hexachlorobenzene | x | | |
| Hexachlorocyclopentadiene | x | x | |
| Lindane | x | | |
| Methoxychlor | x | | |
| Monochlorobenzene | x | x | |
| Oxamyl (Vydate) | x | | |
| Pentachlorophenol | x | | |
| Picloram | x | | |
| Polychlorinated biphenyls (PCB) | x | | |
| Simazine | x | | |
| Styrene | x | x | |
| 2,4,5-TP (Silvex) | x | | |
| Tetrachloroethylene | x | x | |
| 1,2,4-Trichlorobenzene | x | x | |
| 1,1,1-Trichloroethane | x | x | |
| 1,1,2-Trichloroethane | x | x | |
| Trichloroethylene | x | x | |
| 2,3,7,8-TCDD (Dioxin) | x | | |
| Toluene | x | x | |
| Toxaphene | x | | |
| Vinyl chloride | | x | |
| Xylene | x | x | |

b. BATs for inorganic compounds and radionuclides.

(1) Inorganic compounds. The department identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the inorganic contaminants listed in 567—paragraph 41.3(1) “b,” except fluoride.

| INORGANIC CHEMICAL | BAT(s) |
|----------------------|---|
| Antimony | 2, 7 |
| Arsenic ^d | 1, 2, 5, 6, 7, 9, 11 ^e |
| Asbestos | 2, 3, 8 |
| Barium | 5, 6, 7, 9 |
| Beryllium | 1, 2, 5, 6, 7 |
| Cadmium | 2, 5, 6, 7 |
| Chromium | 2, 5, 6 ^b , 7 |
| Cyanide | 5, 7, 12 |
| Mercury | 2 ^a , 4, 6 ^a , 7 ^a |
| Nickel | 5, 6, 7 |
| Nitrate | 5, 7, 9 |
| Nitrite | 5, 7 |
| Selenium | 1, 2 ^c , 6, 7, 9 |
| Thallium | 1, 5 |

Key to BATs

| | | |
|-----------------------------------|---------------------|--|
| 1=Activated Alumina | 5=Ion Exchange | 9=Electrodialysis |
| 2=Coagulation/Filtration* | 6=Lime Softening* | 10=Chlorine |
| 3=Direct and Diatomite Filtration | 7=Reverse Osmosis | 11=Oxidation/Filtration |
| 4=Granular Activated Carbon | 8=Corrosion Control | 12=Alkaline Chlorination (pH greater than or equal to 8.5) |

*not BAT for systems with less than 500 service connections

^aBAT only if influent Hg concentrations are less than or equal to 10 micrograms/liter.

^bBAT for Chromium III only.

^cBAT for Selenium IV only.

^dBAT for Arsenic V. Preoxidation may be required to convert Arsenic III to Arsenic V.

^eTo obtain high removals, iron to arsenic ratio must be at least 20:1.

(2) Small system compliance technologies for arsenic. The department identifies in the following table the affordable technology, treatment techniques, or other means available to systems serving 10,000 or fewer persons for achieving compliance with the arsenic maximum contaminant level.

SMALL SYSTEM COMPLIANCE TECHNOLOGIES FOR ARSENIC¹

| Technology | Affordable for listed small system categories ² |
|---------------------------------------|--|
| Activated alumina | All size categories |
| Coagulation/filtration ³ | 501 – 3,300 and 3,301 – 10,000 |
| Coagulation-assisted microfiltration | 501 – 3,300 and 3,301 – 10,000 |
| Electrodialysis reversal ⁴ | 501 – 3,300 and 3,301 – 10,000 |
| Enhanced coagulation/filtration | All size categories |
| Enhanced lime softening (pH > 10.5) | All size categories |
| Ion exchange | All size categories |
| Lime softening ³ | 501 – 3,300 and 3,301 – 10,000 |
| Oxidation/filtration ⁵ | All size categories |
| Reverse osmosis ⁴ | 501 – 3,300 and 3,301 – 10,000 |

¹Technologies are for Arsenic V. Preoxidation may be required to convert Arsenic III to Arsenic V.

²There are three categories of small systems: those serving 25 to 500 people, those serving 501 to 3,300 people, and those serving 3,301 to 10,000 people.

³Unlikely to be installed solely for arsenic removal. May require pH adjustment to optimal range if high removals are needed.

⁴Technologies reject a large volume of water. May not be appropriate for areas where water quantity may be an issue.

⁵To obtain high removals, iron to arsenic ratio must be at least 20:1.

(3) Radionuclides.

1. The department identifies in the following table the best available technology for achieving compliance with the radionuclide maximum contaminant levels as indicated.

RADIONUCLIDE BAT

| Contaminant | Best Available Technology |
|---|---|
| Gross alpha particle activity (excluding radon and uranium) | Reverse osmosis |
| Beta particle and photon radioactivity | Ion exchange, reverse osmosis |
| Combined radium-226 and radium-228 | Ion exchange, reverse osmosis, lime softening |
| Uranium | Ion exchange, reverse osmosis, lime softening, coagulation/filtration |

2. Small system compliance technologies. The following technologies are identified as radionuclide BAT for systems serving 10,000 or fewer people.

RADIONUCLIDES SMALL SYSTEM COMPLIANCE TECHNOLOGIES

| Contaminant | Compliance Technology ^a |
|--|---|
| Gross alpha particle activity | 2 |
| Beta particle and photon radioactivity | 1, 2 |
| Combined radium-226 and radium-228 | 1, 2, 3, 4, 5, 6, 7 |
| Uranium | 1, 2 ^b , 3 ^b , 8, 9 |

^aCompliance technologies are listed with their corresponding number and potential limitations for use, as follows:

- 1: Ion exchange. The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology.
- 2: Reverse osmosis. Reject water disposal options should be carefully considered before choosing this technology.
- 3: Lime softening. The complexity of the water chemistry may make this technology too complex for small systems.
- 4: Green sand filtration. Removal efficiencies can vary depending on water quality.
- 5: Coprecipitation with barium sulfate. This technology has limited applications to small systems, and is most applicable to systems with sufficiently high sulfate levels that already have a suitable filtration treatment train in place.
- 6: Electrodialysis/electrodialysis reversal.
- 7: Pre-formed hydrous manganese oxide filtration. This technology is most applicable to small systems that have existing filtration technology.
- 8: Activated alumina. The regeneration solution contains high concentrations of the contaminant ions. Disposal options should be carefully considered before choosing this technology. Handling of chemicals required during regeneration and pH adjustment requires an adequately trained operator.
- 9: Enhanced coagulation/filtration. This technology assumes that it is a modification to an existing coagulation/filtration process.

^bNot recommended for systems serving 25 to 500 persons.

c. BATs for disinfection byproducts and disinfectants. The department identifies the following as the best technology, treatment techniques, or other means available for achieving compliance with the maximum contaminant levels for the disinfection byproducts listed in 567—paragraph 41.5(2) “b,” and the maximum residual disinfectant levels listed in 567—paragraph 41.5(2) “c.”

| DBP MCL or MRDL | Best Available Technology |
|--|--|
| Bromate MCL | Control of ozone treatment process to reduce production of bromate |
| Chlorite MCL | Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels |
| HAA5 and TTHM MCL running annual average | Enhanced coagulation or enhanced softening or GAC10, with chlorine as the primary and residual disinfectant |
| HAA5 and TTHM MCL LRAA | <ul style="list-style-type: none"> • Non-consecutive system: Enhanced coagulation or enhanced softening, plus GAC10; or nanofiltration with a molecular weight cutoff that is less than or equal to 1000 Daltons; or GAC20 • Consecutive system serving at least 10,000 persons*: Improved distribution system and storage tank management to reduce residence time, plus the use of chloramines for disinfectant residual maintenance • Consecutive system serving fewer than 10,000 persons*: Improved distribution system and storage tank management to reduce residence time |
| MRDL | Control of treatment processes to reduce disinfectant demand and control of disinfection treatment processes to reduce disinfectant levels |

* Applies only to the disinfected water that consecutive systems buy or otherwise receive.

d. Requirement to install BAT. The department shall require community water systems and nontransient noncommunity water systems to install and use any treatment method identified in 43.3(10) as a condition for granting an interim contaminant level except as provided in paragraph “e.” If, after the system’s installation of the treatment method, the system cannot meet the maximum contaminant level, the system shall be eligible for a compliance schedule with an interim contaminant level granted under the provisions of 567—subrule 42.1(9) and rule 567—43.2(455B).

e. Engineering assessment option. If a system can demonstrate through comprehensive engineering assessments, which may at the direction of the department include pilot plant studies, that the treatment methods identified in 43.3(10) would only achieve a de minimis reduction in contaminants, the department may issue a schedule of compliance that requires the system being granted the variance to examine other treatment methods as a condition of obtaining the interim contaminant level.

f. Compliance schedule. If the department determines that a treatment method identified in 43.3(10) “a,” “b,” and “c” is technically feasible, the department may require the system to install or use that treatment method in connection with a compliance schedule issued under the provisions of 567—subrule 42.1(9) and rule 567—43.2(455B). The determination shall be based upon studies by the system and other relevant information.

g. Avoidance of unacceptable risk to health (URTH). The department may require a public water system to use bottled water, point-of-use devices, point-of-entry devices or other means as a condition of granting a variance or an exemption, or issuance of a compliance schedule, from the requirements of 43.3(10) to avoid an unreasonable risk to health.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.4(455B) Certification of completion. Within 30 days after completion of construction, installation or modification of any project, the permit holder shall submit a certification by a licensed professional engineer that the project was completed in accordance with the approved plans and specifications except if the project received a waiver pursuant to 43.3(4).

567—43.5(455B) Filtration and disinfection for surface water and influenced groundwater public water supply systems.

43.5(1) Applicability/general requirements.

a. These rules apply to all public water supply systems using surface water or groundwater under the direct influence of surface water, in whole or in part, and establish criteria under which filtration is

required as a treatment technique. In addition, these rules establish treatment technique requirements in lieu of maximum contaminant levels for *Giardia lamblia*, heterotrophic plate count bacteria, *Legionella*, viruses and turbidity. Each public water system with a surface water source or a groundwater source under the direct influence of surface water must provide treatment of that source water which complies with these treatment technique requirements. Systems which serve at least 10,000 persons must also comply with the requirements of 567—43.9(455B). Systems which serve fewer than 10,000 persons must also comply with the requirements of 567—43.10(455B). The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

(1) At least 99.9 percent (3-log) removal or inactivation of *Giardia lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer; and

(2) At least 99.99 percent (4-log) removal or inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

b. Criteria for identification of groundwater under the direct influence of surface water. “Groundwater under the direct influence of surface water” means any water beneath the surface of the ground with: (1) significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia*, or (2) significant and relatively rapid shifts in water characteristics such as turbidity (particulate content), temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the department. The department determination of direct influence may be based on site-specific measurements of water quality or documentation of well construction characteristics and geology with field evaluation. Only surface water and groundwater sources under the direct influence of surface water that are at risk to the contamination from *Giardia* cysts are subject to the requirements of this rule. Groundwater sources shall not be subject to this rule. The evaluation process shall be used to delineate between surface water, groundwater under the direct influence of surface water and groundwater. The identification of a source as surface water and groundwater under the direct influence of surface water shall be determined for an individual source, by the department, in accordance with the following criteria. The public water supply shall provide to the department that information necessary to make the determination. The evaluation process will involve one or more of the following steps:

(1) Preliminary evaluation. The department shall conduct a preliminary evaluation of information on the source provided by the public water supply to determine if the source is an obvious surface water (e.g., pond, lake, stream) or groundwater under the direct influence of surface water. The source shall be evaluated during that period of highest susceptibility to influence from surface water. The preliminary evaluation may include a review of surveys, reports, geological information of the area, physical properties of the source, and a review of departmental and public water system records. If the source is identified as a surface water, no additional evaluation shall be conducted. If the source is a groundwater and identified as a deep well, it shall be classified as a groundwater not under the direct influence of surface water and no additional evaluation shall be conducted, unless through direct knowledge or documentation the source does not meet the requirements of 43.5(1)“b”(2). The deep well shall then be evaluated in accordance with 43.5(1)“b”(3). If the source is a shallow well, the source shall be evaluated in accordance with 43.5(1)“b”(2). If the source is a spring, infiltration gallery, radial collector well, or any other subsurface source, it shall be evaluated in accordance with 43.5(1)“b”(3).

(2) Well source evaluation. Shallow wells greater than 50 feet in lateral distance from a surface water source shall be evaluated for direct influence of surface water through a review of departmental or public water system files in accordance with 43.5(1)“b”(2)“1” and 43.5(1)“b”(2)“2.” Sources that meet the criteria shall be considered to be not under the direct influence of surface water. No additional evaluation will be required. Shallow wells 50 feet or less in lateral distance from a surface water shall be in accordance with 43.5(1)“b”(3) and (4).

1. Well construction criteria. The well shall be constructed so as to prevent surface water from entering the well or traversing the casing.

2. Water quality criteria. Water quality records shall indicate:
 - No record of total coliform or fecal coliform contamination in untreated samples collected over the past three years.
 - No history of turbidity problems associated with the well, other than turbidity as a result of inorganic chemical precipitates.
 - No history of known or suspected outbreak of *Giardia* or other pathogenic organisms associated with surface water (e.g., *Cryptosporidium*) which has been attributed to the well.

3. Other available data. If data on particulate matter analysis of the well are available, there shall be no evidence of particulate matter present that is associated with surface water. If information on turbidity or temperature monitoring of the well and nearby surface water is available, there shall be no data on the source which correlates with that of a nearby surface water.

4. Further evaluation. Wells that do not meet all the requirements listed shall require further evaluation in accordance with 43.5(1)“b”(3) and (4).

- (3) Formal evaluation. The evaluation shall be conducted by the department or a licensed professional engineer at the direction of the public water supply. The evaluation shall include:

1. Complete file review. In addition to the information gathered in 43.5(1)“b”(1), the complete file review shall consider but not be limited to: design and construction details; evidence of direct surface water contamination; water quality analysis; indications of waterborne disease outbreaks; operational procedures; and customer complaints regarding water quality or water-related infectious illness. Sources other than a well source shall be evaluated in a like manner to include a field survey.

2. Field survey. A field survey shall substantiate findings of the complete file review and determine if the source is at risk to pathogens from direct surface water influence. The field survey shall examine the following criteria for evidence that surface water enters the source through defects in the source which include but are not limited to: a lack of a surface seal on wells, infiltration gallery laterals exposed to surface water, springs open to the atmosphere, surface runoff entering a spring or other collector, and distances to obvious surface water sources.

A report summarizing the findings of the complete file review and field survey shall be submitted to the department for final review and classification of the source. If the complete file review or field survey demonstrates conclusively that the source is subject to the direct surface water influence, the source shall be classified as under the direct influence of surface water. Either method or both may be used to demonstrate that the source is a surface water or groundwater under the direct influence of surface water. If the findings do not demonstrate conclusive evidence of direct influence of surface water, the analysis outlined in 43.5(1)“b”(4) should be conducted.

- (4) Particulate analysis and physical properties evaluation.

1. Surface water indicators. Particulate analysis shall be conducted to identify organisms which only occur in surface waters as opposed to groundwaters, and whose presence in a groundwater would indicate the direct influence of surface water.

- Identification of a *Giardia* cyst, live diatoms, and blue-green, green, or other chloroplast containing algae in any source water shall be considered evidence of direct surface water influence.

- Rotifers and insect parts are indicators of surface water. Without knowledge of which species is present, the finding of rotifers indicates that the source is either directly influenced by surface water, or the water contains organic matter sufficient to support the growth of rotifers. Insects or insect parts shall be considered strong evidence of surface water influence, if not direct evidence.

- The presence of coccidia (e.g., *Cryptosporidium*) in the source water is considered a good indicator of direct influence of surface water. Other macroorganisms (greater than 7 um) which are parasitic to animals and fish such as, but not limited to, helminths (e.g., tapeworm cysts), ascaris, and *Diphyllobothrium*, shall be considered as indicators of direct influence of surface water.

2. Physical properties. Turbidity, temperature, pH and conductivity provide supportive, but less direct, evidence of direct influence of surface water. Turbidity fluctuations of greater than 0.5-1.0 NTU over the course of a year may be indicative of direct influence of surface water. Temperature fluctuations may also indicate surface water influence. Changes in other chemical parameters such as pH, conductivity, or hardness may also give an indirect indication of influence by nearby surface water.

c. Compliance. A public water system using a surface water source or a groundwater source under the direct influence of surface water is considered to be in compliance with the requirements of this subrule if it meets the filtration requirements in 43.5(3) and the disinfection requirements in 43.5(2) in accordance with the effective dates specified within the respective subrules.

d. Certified operator requirement. Each public water system using a surface water source or a groundwater source under the direct influence of surface water must be operated by a certified operator who meets the requirements of 567—Chapter 81.

43.5(2) Disinfection. All community and noncommunity public water supply systems using surface water or groundwater under the direct influence of surface water in whole or in part shall be required to provide disinfection in compliance with this subrule and filtration in compliance with 43.5(3). If the department has determined that filtration is required, the system must comply with any interim disinfection requirements the department deems necessary before filtration is installed. A system providing filtration on or before December 30, 1991, must meet the disinfection requirements of this subrule beginning June 29, 1993. A system providing filtration after December 30, 1991, must meet the disinfection requirements of this subrule when filtration is installed. Failure to meet any requirement of this subrule after the applicable date specified in this subrule is a treatment technique violation. The disinfection requirements are as follows:

a. *Disinfection treatment criteria.* The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9 percent (3-log) inactivation or removal of *Giardia lamblia* cysts and at least 99.99 percent (4-log) inactivation or removal of viruses, acceptable to the department. At least 0.5 log inactivation of *Giardia lamblia* cysts must be achieved through disinfection treatment using a chemical disinfectant even if the required inactivation or removal is met or exceeded through physical treatment processes. Each system is required to calculate the total inactivation ratio ($CT_{\text{calculated}}/CT_{\text{required}}$) each day the treatment plant is in operation. The system's total inactivation ratio must be equal to or greater than 1.0 in order to ensure that the minimum inactivation and removal requirements have been achieved. If the system's total inactivation ratio for the day is below 1.0, the system must notify the department within 24 hours.

b. *Disinfection system.* The disinfection system must include:

(1) Redundant components, including an auxiliary power supply with automatic start-up and alarm to ensure that disinfectant application is maintained continuously while water is being delivered to the distribution system, or

(2) Automatic shutoff of delivery of water to the distribution system whenever there is less than 0.3 mg/L of residual disinfectant concentration in the water. If the department determines that automatic shutoff would cause unreasonable risk to health or interfere with fire protection, the system must comply with 43.5(2)“b”(1).

c. *Residual disinfectant entering system.* The residual disinfectant concentration in the water entering the distribution system, measured as specified in 43.5(4)“a”(5) and 43.5(4)“b”(2), cannot be less than 0.3 mg/L free residual or 1.5 mg/L total residual chlorine for more than four hours.

d. *Residual disinfectant in the system.* The residual disinfectant concentration in the distribution system, measured as total chlorine, combined chlorine, or chlorine dioxide, as specified in 43.5(4)“a”(5) and 43.5(4)“b”(2), cannot be undetectable in more than 5 percent of the samples each month for any two consecutive months that the system serves water to the public. Water within the distribution system with a heterotrophic plate count bacteria concentration less than or equal to 500/mL, measured as heterotrophic plate count (HPC) as specified in 567—paragraph 41.2(3)“e,” is deemed to have a detectable disinfectant residual for purposes of determining compliance with this requirement. Therefore, the value “V” in the following formula cannot exceed 5 percent in one month for any two consecutive months.

$$V = \left[\frac{c + d + e}{a + b} \right] \times 100$$

where:

- a = number of instances in which the residual disinfectant concentration is measured;
- b = number of instances in which the residual disinfectant concentration is not measured but heterotrophic plate count bacteria (HPC) is measured;
- c = number of instances in which the residual disinfectant concentration is measured but not detected and no HPC is measured;
- d = number of instances in which no residual disinfectant concentration is detected and where the HPC is greater than 500/mL; and
- e = number of instances in which the residual disinfectant concentration is not measured and HPC is greater than 500/mL.

43.5(3) Filtration.

a. *Applicability.* A public water system that uses a surface water source or a groundwater source under the direct influence of surface water must provide treatment consisting of both disinfection, as specified in 43.5(2), and filtration treatment which complies with the turbidity requirements of subrules 43.5(3), 43.5(4), and 43.5(5). A system providing or required to provide filtration on or before December 30, 1991, must meet the requirements of this subrule by June 29, 1993. A system providing or required to provide filtration after December 30, 1991, must meet the requirements of this subrule when filtration is installed. Beginning January 1, 2002, systems serving at least 10,000 people must meet the turbidity requirements in 567—43.9(455B). Beginning January 1, 2005, systems serving fewer than 10,000 people must meet the turbidity requirements in 567—43.10(455B). A system shall install filtration within 18 months after the department determines, in writing, that filtration is required. The department may require and the system shall comply with any interim turbidity requirements the department deems necessary. Failure to meet any requirements of the referenced subrules after the dates specified is a treatment technique violation.

b. *Conventional filtration treatment or direct filtration.*

(1) For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 nephelometric turbidity units (NTU) in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

c. *Slow sand filtration.*

(1) For systems using slow sand filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

d. *Diatomaceous earth filtration.*

(1) For systems using diatomaceous earth filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

e. *Other filtration technologies.* A public water system may use either a filtration technology not listed in 43.5(3) "b" to 43.5(3) "d" or a filtration technology listed in 43.5(3) "b" or 43.5(3) "c" at a higher turbidity level if it demonstrates to the department through a preliminary report submitted by a licensed professional engineer, using pilot plant studies or other means, that the alternative filtration technology in combination with disinfection treatment that meets the requirements of 43.5(2) consistently achieves 99.9 percent removal or inactivation of *Giardia lamblia* and 99.99 percent removal or inactivation of viruses. For a system that uses alternative filtration technology and makes this demonstration, the turbidity treatment technique requirements are as follows:

(1) The turbidity level of representative samples of a system's filtered water must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed 5 NTU when measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

Beginning January 1, 2002, systems serving at least 10,000 people must meet the requirements for other filtration technologies in 43.9(3) "b."

Beginning January 1, 2005, systems serving fewer than 10,000 people must meet the requirements for other filtration technologies in 567—43.10(455B).

43.5(4) Analytical and monitoring requirements.

a. Analytical requirements. Only the analytical method(s) specified in this paragraph, or otherwise approved by the department, may be used to demonstrate compliance with the requirements of 43.5(2) and 43.5(3). Measurements for pH, temperature, turbidity, and residual disinfectant concentrations must be conducted by a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83. For consecutive public water supplies from a surface water or groundwater under the direct influence of surface water system, the disinfectant concentration analyses must be conducted by a certified operator who meets the requirements of 567—Chapter 81. Measurements for heterotrophic plate count bacteria must be conducted by a laboratory certified by the department to do such analysis.

(1) Turbidity analytical methodology. Turbidity analysis shall be conducted using the methodology in the following table. Each turbidimeter must be calibrated at least once every 90 days with a primary standard. The calibration of each turbidimeter used for compliance must be verified at least once per week with a primary standard, secondary standards, or the manufacturer's proprietary calibration confirmation device or by a method approved by the department. If the verification is not within plus or minus 0.05 NTU for measurements of less than or equal to 0.5 NTU, or within plus or minus 10 percent of measurements greater than 0.5 NTU, the turbidimeter must be recalibrated.

| Methodology | Analytical Method | | | | |
|-----------------------------|--------------------|--------------------|-----------------------|-------------------------------|--|
| | EPA | SM | GLI | HACH | Other |
| Nephelometric ⁵ | 180.1 ¹ | 2130B ² | Method 2 ³ | FilterTrak 10133 ⁴ | |
| Laser Nephelometry (online) | | | | | Mitchell M5271 ⁶ ; Mitchell M5331 Rev. 1.2 ¹⁰ |
| LED Nephelometry (online) | | | | | Mitchell M5331 ⁷ ; Mitchell M5331 Rev. 1.2 ¹⁰ ; AMI Turbiwell ⁹ |
| LED Nephelometry (portable) | | | | | Orion AQ4500 ⁸ |
| 360-degree Nephelometry | | | | | Hach Method 10258 ¹¹ |

¹"Methods for the Determination of Inorganic Substances in Environmental Samples," EPA-600/R-93-100, August 1993. Available at NTIS, PB94-121811.

²Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, 19th edition, 1995, 20th edition, 1998, 21st edition, 2005, and 22nd edition, 2012 (any of these editions may be used), American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

³GLI Method 2, "Turbidity," November 2, 1992, Great Lakes Instruments, Inc., 8855 North 55th Street, Milwaukee, WI 53223.

⁴Hach FilterTrak Method 10133, "Determination of Turbidity by Laser Nephelometry," January 2000, Revision 2.0, Hach Co., P.O. Box 389, Loveland, CO 80539-0389, telephone (800)227-4224.

⁵Styrene divinyl benzene beads (e.g., AMCO-AEPA-1 or equivalent) and stabilized formazin (e.g., Hach StablCal™ or equivalent) are acceptable substitutes for formazin.

⁶Mitchell Method M5271, Revision 1.1. "Determination of Turbidity by Laser Nephelometry," March 5, 2009. Available at www.nemi.gov or from Leck Mitchell, 656 Independence Valley Drive, Grand Junction, CO 81507.

⁷Mitchell Method M5331, Revision 1.1. "Determination of Turbidity by LED Nephelometry," March 5, 2009. Available at www.nemi.gov or from Leck Mitchell, 656 Independence Valley Drive, Grand Junction, CO 81507.

⁸Orion Method AQ4500, Revision 1.0. "Determination of Turbidity by LED Nephelometry," May 8, 2009. Available at www.nemi.gov or from Thermo Scientific, 166 Cummings Center, Beverly, MA 01915, www.thermo.com.

⁹AMI Turbiwell, "Continuous Measurement of Turbidity Using a SWAN AMI Turbiwell Turbidimeter," August 2009. Available at www.nemi.gov or from Markus Bernasconi, SWAN Analytische Instrumente AG, Studbachstrasse 13, CH-8340 Hinwil, Switzerland.

¹⁰Mitchell Method M5331, Revision 1.2. "Determination of Turbidity by LED or Laser Nephelometry," February 2016. Available from Leck Mitchell, 656 Independence Valley Drive, Grand Junction, CO 81507.

¹¹Hach Company. "Hach Method 10258 – Determination of Turbidity by 360-Degree Nephelometry," January 2016. Available at www.hach.com.

(2) Temperature analytical methodology. The temperature shall be determined in compliance with the methodology listed in 567—subparagraph 41.4(1) "g"(1).

(3) pH (hydrogen ion concentration) analytical methodology. The pH shall be determined in compliance with the methodology listed in 567—subparagraph 41.4(1) "g"(1).

(4) Heterotrophic plate count bacteria analytical methodology. The heterotrophic plate count bacteria sampling and analysis shall be conducted in compliance with 567—subrule 41.2(3) and 43.5(2) "d." The time from sample collection to initiation of analysis shall not exceed eight hours, and the samples must be held below 10 degrees C during transit.

(5) Residual disinfectant analytical methodology. The residual disinfectant concentrations shall be determined in compliance with one of the analytical methods in the following table. Residual disinfectant concentrations for free chlorine and combined chlorine may also be measured by using DPD colorimetric test kits. Free and total chlorine residuals may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy and precision remain the same. Instruments used for continuous monitoring must be verified with a grab sample measurement at least every seven days. The analyzer concentration must be within plus or minus 0.1 mg/L or plus or minus 15 percent (whichever is larger) of the grab sample measurement. If the verification is not within this range, immediate actions must be taken to resolve the issue and another verification must be conducted.

Disinfectant Analytical Methodology

| Residual | Methodology | Standard Methods ^{1,2} | Standard Methods Online ⁶ | Other |
|------------------|--|---|--|--|
| Free chlorine | Amperometric Titration DPD Ferrous Titrimetric DPD Colorimetric Syringaldazine (FACTS) Online Chlorine Analyzer Amperometric Sensor Indophenol Colorimetric | 4500-Cl D 4500-Cl F 4500-Cl G 4500-Cl H | 4500-Cl D-00 4500-Cl F-00 4500-Cl G-00 4500-Cl H-00 | D1253-03 ⁴ , 08, 14 Hach Method 10260 ¹⁰ EPA 334.0 ⁷ ChloroSense ⁸ Hach Method 10241 ¹¹ |
| Total chlorine | Amperometric Titration Amperometric Titration (low-level measurement) DPD Ferrous Titrimetric DPD Colorimetric Iodometric Electrode Online Chlorine Analyzer Amperometric Sensor | 4500-Cl D 4500-Cl E 4500-Cl F 4500-Cl G 4500-Cl I | 4500-Cl D-00 4500-Cl E-00 4500-Cl F-00 4500-Cl G-00 4500-Cl I-00 | D1253-03 ⁴ , 08, 14 Hach Method 10260 ¹⁰ EPA 334.0 ⁷ ChloroSense ⁸ |
| Chlorine dioxide | Amperometric Titration DPD Method Amperometric Titration Amperometric Sensor Spectrophotometric | 4500-ClO ₂ C 4500-ClO ₂ D 4500-ClO ₂ E | 4500-C10 ₂ C-00 4500-C10 ₂ E-00 | ChlordioX Plus ⁹ 327.0, Revision 1.1 ⁵ |
| Ozone | Indigo method | 4500-O ₃ B ³ | 4500-O ₃ B-97 | |

¹Standard Methods for the Examination of Water and Wastewater, 18th edition, 1992, 19th edition, 1995, 20th edition, 1998, 21st edition, 2005, or 22nd edition, 2012 (any of these editions may be used), American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710. Only the 18th, 19th, and 20th editions may be used for chlorine dioxide Method 4500-ClO₂ D.

²Other analytical test procedures are contained within Technical Notes on Drinking Water Methods, EPA-600/R-94-173, October 1994, which is available as NTIS PB95-104766.

³Standard Methods for the Examination of Water and Wastewater, 18th edition (1992), 19th edition (1995), 21st edition (2005), and 22nd edition (2012) (any edition may be used); American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710.

⁴Annual Book of ASTM Standards, Vol. 11.01, 2004; ASTM International; any year containing the cited version of the method may be used. Copies of this method may be obtained from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

⁵EPA Method 327.0, Revision 1.1, "Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry," US EPA, May 2005, EPA 815-R-05-008. Available online at www.nemi.gov.

⁶Standard Methods Online is available at www.standardmethods.org. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

⁷EPA Method 334.0, "Determination of Residual Chlorine in Drinking Water Using an On-Line Chlorine Analyzer," August 2009. EPA 815-B-09-013. Available at www.nemi.gov.

⁸ChloroSense, "Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense," September 2009. Available at www.nemi.gov or from Palintest Ltd., 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018.

⁹ChlordioX Plus. "Chlorine Dioxide and Chlorite in Drinking Water by Amperometry Using Disposable Sensors," November 2013. Available from Palintest Ltd., Jamike Avenue (Suite 100), Erlanger, KY 41018.

¹⁰Hach Company. "Hach Method 10260 – Determination of Chlorinated Oxidants (Free and Total) in Water Using Disposable Planar Reagent-Filled Cuvettes and Mesofluidic Channel Colorimetry," April 2013. Available at www.hach.com.

¹¹Hach Company. "Hach Method 10241 – Spectrophotometric Measurement of Free Chlorine in Finished Drinking Water," November 2015, Revision 1.2. Available at www.hach.com.

b. Monitoring requirements. A public water system that uses a surface water source or groundwater source under the influence of surface water must monitor in accordance with this paragraph.

(1) Turbidity.

1. Routine turbidity monitoring requirements. Turbidity measurements as required by 43.5(3) must be performed on representative samples of the system's filtered water every four hours (or more frequently as long as measurements are recorded at equal time intervals and detailed in the turbidity protocol) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring or may monitor more frequently than every four hours if it validates the continuous measurement for accuracy on a regular basis using a turbidity protocol approved by the department and audited for compliance during sanitary surveys. Major elements of the protocol shall include, but are not limited to: sample measurement location, method of calibration, calibration frequency, calibration standards, method of verification, verification frequency, documentation, data collection, data recording frequency, and data reporting. For any systems using slow sand filtration or filtration treatment other than conventional treatment, direct filtration, or diatomaceous earth filtration, the department may reduce the sampling frequency to once per day if it determines that less frequent monitoring is sufficient to indicate effective filtration performance. For systems serving 500 or fewer persons, the department may reduce the turbidity sampling frequency to once per day, regardless of the type of filtration treatment used, if the department determines that less frequent monitoring is sufficient to indicate effective filtration performance. Approval shall be based upon documentation provided by the system, acceptable to the department and pursuant to the conditions of an operation permit.

2. Turbidity monitoring requirements for population greater than 100,000. A supplier of water serving a population or population equivalent of greater than 100,000 persons shall provide a continuous or rotating cycle turbidity monitoring and recording device or take hourly grab samples to determine

compliance with 43.5(3). The system must meet the requirements in 43.5(4) “b”(1)“1,” including the turbidity protocol.

3. Failure of the continuous turbidity monitoring equipment. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is repaired and back online. A system has a maximum of five working days after failure to repair the equipment or else the system is in violation. The system must notify the department within 24 hours of both when the turbidimeter was taken offline and when it was returned online.

(2) Residual disinfectant.

1. Residual disinfectant entering the system. The residual disinfectant concentration of the water entering the distribution system shall be monitored continuously, and the lowest value recorded each day, except that if there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but not to exceed five working days following the failure of the equipment. If acceptable to the department, systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies prescribed below:

Residual Disinfectant Samples Required of Surface Water or IGW PWS

| System size (persons served) | Samples per day* |
|------------------------------|------------------|
| 500 or fewer | 1 |
| 501 to 1,000 | 2 |
| 1,001 to 2,500 | 3 |
| 2,501 to 3,300 | 4 |

*When more than one grab sample is required per day, the day’s samples cannot be taken at the same time. The sampling intervals must be at a minimum of four-hour intervals.

If at any time the disinfectant concentration falls below 0.3 mg/L free residual or 1.5 mg/L total residual chlorine in a system using grab sampling in lieu of continuous monitoring, the system shall take a grab sample every four hours until the residual disinfectant concentration is equal to or greater than 0.3 mg/L free residual or 1.5 mg/L total residual chlorine.

2. Residual disinfectant in the system. The residual disinfectant concentration must be measured at least daily in the distribution system. Residual disinfectant measurements that are required as part of the total coliform bacteria sample collection under 567—subparagraph 41.2(1) “c”(7) shall be used to satisfy this requirement on the day(s) when a bacteria sample(s) is collected. The department may allow a public water system that uses both a groundwater source and a surface water source or a groundwater source under direct influence of surface water to take residual disinfectant samples at points other than the total coliform sampling points, if these points are included as a part of the coliform sample site plan meeting the requirements of 567—paragraph 41.2(1) “c”(1)“1” and if the department determines that such points are representative of treated (disinfected) water quality within the distribution system. Heterotrophic plate count bacteria (HPC) may be measured in lieu of residual disinfectant concentration, using the analytical methods specified in 567—subparagraph 41.2(3) “e”(1). The time from sample collection to initiation of analysis shall not exceed eight hours. HPC samples must be kept below 10 degrees C during transit to the laboratory. All HPC samples must be analyzed by a department-certified laboratory meeting the requirements of 567—Chapter 83.

43.5(5) Reporting requirements. Public water supplies shall report the results of routine monitoring required to demonstrate compliance with 567—43.5(455B) and treatment technique violations as follows:

a. *Waterborne disease outbreak.* Each system, upon discovering that a waterborne disease outbreak potentially attributable to that water system has occurred, must report that occurrence to the department as soon as possible, but no later than by the end of the next business day.

b. Turbidity exceeds 5 NTU. If at any time the turbidity exceeds 5 NTU, the system must inform the department as soon as possible, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3)“b”(3).

c. Residual disinfectant entering distribution system below 0.3 mg/L free residual chlorine or 1.5 mg/L total residual chlorine. If at any time the residual falls below 0.3 mg/L free residual chlorine or 1.5 mg/L total residual chlorine in the water entering the distribution system, the system must notify the department as soon as possible, but no later than by the end of the next business day. The system also must notify the department by the end of the next business day whether or not the residual was restored to at least 0.3 mg/L free residual chlorine or 1.5 mg/L total residual chlorine within four hours.

d. Routine monitoring reporting requirements. Routine monitoring results shall be provided as part of the monthly operation reports in accordance with 567—40.3(455B) and 567—subrule 42.4(3).

e. Total inactivation ratio below 1.0. If the system’s total inactivation ratio for the day is below 1.0, the system must notify the department within 24 hours.

43.5(6) Filter backwash recycle provisions. All surface water or influenced groundwater systems that employ conventional filtration or direct filtration treatment and that recycle spent filter backwash water, thickener supernatant, or liquids from dewatering processes must meet the requirements of this subrule.

a. Reporting. A system must notify the department in writing by December 8, 2003, if the system recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes. This notification must include the following information at a minimum:

(1) A plan schematic showing the origin of all flows which are recycled (including, but not limited to, spent filter backwash water, thickener supernatant, and liquids from dewatering processes), the hydraulic conveyance used to transport them, and the location where they are reintroduced back into the treatment plant.

(2) Typical recycle flow in gallons per minute (gpm), the highest observed plant flow experience in the previous year (in gpm), design flow for the treatment plant (in gpm), the minimum plant rate (in gpm) during which the filter backwash will be recycled, and department-approved operating capacity for the plant where the department has made such determinations.

b. Treatment technique requirement. Any system that recycles spent filter backwash water, thickener supernatant, or liquids from dewatering processes must return these flows through the processes of a system’s existing conventional or direct filtration system as defined in 567—40.2(455B) or at an alternate location approved by the department by June 8, 2004. However, if capital improvements are required to modify the recycle location to meet this requirement, all capital improvements must be completed no later than June 8, 2006.

c. Record keeping. The system must collect and retain on file the recycle flow information specified below for review and evaluation by the department beginning June 8, 2004.

(1) A copy of the recycle notification and information submitted to the department under paragraph “a” of this subrule.

(2) A list of all recycle flows and the frequency with which they are returned.

(3) The average and maximum backwash flow rate through the filters and the average and maximum duration of the filter backwash process in minutes.

(4) The typical filter run length and a written summary of how filter run length is determined.

(5) The type of treatment provided for the recycle flow.

(6) Data on the physical dimensions of the equalization and treatment units, typical and maximum hydraulic loading rates, type of treatment chemicals used including average dose and frequency of use, and frequency at which solids are removed, if applicable.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.6(455B) Residual disinfectant and disinfection byproduct precursors.

43.6(1) Residual disinfectant.

a. Applicability.

(1) CWS and NTNC systems. This rule establishes criteria under which CWS and NTNC public water supply systems that add a chemical disinfectant to the water in any part of the drinking water treatment process or that provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in 567—41.6(455B), the maximum residual disinfectant levels (MRDL) listed in this subrule, and treatment technique requirements for disinfection byproduct precursors listed in subrule 43.6(3).

(2) TNC systems with chlorine dioxide disinfection. This rule establishes criteria under which TNC public water supply systems that use chlorine dioxide as a disinfectant or oxidant must modify their practices to meet the chlorine dioxide MRDL listed in paragraph 43.6(1)“b.”

(3) Compliance dates. Compliance dates for this rule are based upon the source water type and the population served. Systems are required to comply with this rule as follows, unless otherwise noted:

1. Surface water and IGW CWS and NTNC. CWS and NTNC systems using surface water or groundwater under the direct influence of surface water (IGW) in whole or in part and which serve 10,000 or more persons must comply with this rule beginning January 1, 2002. CWS and NTNC surface water or IGW systems serving fewer than 10,000 persons must comply with this rule beginning January 1, 2004.

2. Groundwater CWS and NTNC. CWS and NTNC systems using only groundwater not under the direct influence of surface water must comply with this rule beginning January 1, 2004.

3. TNC using chlorine dioxide. TNC systems serving over 10,000 persons and using surface water or groundwater under the direct influence of surface water and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this rule beginning January 1, 2002. TNC systems serving 10,000 persons or less, regardless of source water type, and using chlorine dioxide as a disinfectant or oxidant must comply with any requirements for chlorine dioxide in this rule beginning January 1, 2004.

4. Extension of compliance period for GAC or membrane technology installation. A system that is installing GAC or membrane technology to comply with this rule may apply to the department for an extension of up to 24 months past the dates in 43.6(1)“a”(3), but not beyond December 31, 2003. In granting the extension, the department will set a schedule for compliance and may specify any interim measures the system must take. Failure to meet a compliance schedule or interim treatment requirements constitutes a violation of the public drinking water supply rules, requires public notification per 567—subrule 42.1(1), and may result in an administrative order.

(4) Control of residual disinfectants. Notwithstanding the MRDLs in this rule, systems may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health, to address specific microbiological contamination problems caused by circumstances such as, but not limited to, distribution line breaks, storm run-off events, source water contamination events, or cross-connection events.

(5) Consecutive systems. Consecutive systems that provide water containing a disinfectant or oxidant are required to comply with this rule.

(6) Systems with multiple water sources. Systems with water sources that are used independently from each other, are not from the same source as determined by the department, or do not go through identical treatment processes are required to conduct the monitoring for the applicable disinfectants or oxidants and disinfection byproducts during operation of each source. The system must comply with this rule during the use of each water source.

b. Maximum residual disinfectant levels. Maximum residual disinfectant levels (MRDLs) are as follows:

| Disinfection Residual | MRDL (mg/L) |
|-----------------------|-------------------------|
| Chloramines | 4.0 as Cl ₂ |
| Chlorine | 4.0 as Cl ₂ |
| Chlorine dioxide | 0.8 as ClO ₂ |

c. Monitoring requirements for residual disinfectants.

(1) General requirements.

1. Systems must take all samples during normal operating conditions. If the system does not use the disinfectant or oxidant on a daily basis, the system must conduct the required daily monitoring each day the disinfectant or oxidant is used, and any required monthly monitoring during those months in which the disinfectant or oxidant is used during any portion of the month.

2. Failure to monitor in accordance with the monitoring plan required under 43.6(1) "c"(1)"5" is a monitoring violation.

3. Failure to monitor is a violation for the entire period covered by the annual average where compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs.

4. Systems may use only data collected under the provisions of this rule or of 567—41.6(455B) to qualify for reduced monitoring.

5. Systems required to monitor under the provisions of this rule or of 567—41.6(455B) must develop and implement a monitoring plan, in accordance with 567—paragraph 41.6(1) "c"(1)"6."

(2) Chlorine and chloramines.

1. Routine monitoring. Community and nontransient noncommunity water systems that use chlorine or chloramines must measure the residual disinfectant level at the same points in the distribution system and at the same time as total coliforms are sampled, as specified in 567—subrule 41.2(1). Surface water and groundwater under the direct influence of surface water systems may use the results of residual disinfectant concentration sampling conducted under 43.5(4) "b"(2)"2," in lieu of taking separate samples.

2. Reduced monitoring. Chlorine and chloramine monitoring may not be reduced.

(3) Chlorine dioxide.

1. Routine monitoring. Any public water supply systems that use chlorine dioxide for disinfection or oxidation must take daily samples at the entrance to the distribution system. For any daily sample that exceeds the MRDL, the system must take samples in the distribution system the following day at the locations required by 43.6(1) "c"(3)"2," in addition to the sample required at the entrance to the distribution system.

2. Additional monitoring. On each day following a routine sample monitoring result that exceeds the MRDL, the system is required to take three chlorine dioxide distribution system samples.

- If chlorine dioxide or chloramines are used to maintain a residual disinfectant in the distribution system, or if chlorine is used to maintain a residual disinfectant in the distribution system and there are no disinfection addition points after the entrance to the distribution system (i.e., no booster chlorination), the system must take three samples as close to the first customer as possible, at intervals of at least six hours.

- If chlorine is used to maintain a residual disinfectant in the distribution system and there are one or more disinfection addition points after the entrance to the distribution system (i.e., booster chlorination), the system must take one sample at each of the following locations: as close to the first customer as possible, in a location representative of average residence time, and as close to the end of the distribution system as possible (reflecting maximum residence time in the distribution system).

3. Reduced monitoring. Chlorine dioxide monitoring may not be reduced.

d. Analytical requirements for residual disinfectants.

(1) Analytical methods. Systems must measure residual disinfectant concentrations for free chlorine, combined chlorine (chloramines), and chlorine dioxide by the methods listed in the following table:

Approved Methods for Residual Disinfectant Compliance Monitoring

| Methodology | Standard Methods | Other Method | Residual measured ¹ | | | |
|------------------------------------|-------------------------|----------------------------------|--------------------------------|-------------------|----------------|------------------|
| | | | Free Chlorine | Combined Chlorine | Total Chlorine | Chlorine Dioxide |
| Amperometric Titration | 4500-Cl D | ASTM: D 1253-86 (96), 03, 08, 14 | X | X | X | |
| Low Level Amperometric Titration | 4500-Cl E | | | | X | |
| DPD Ferrous Titrimetric | 4500-Cl F | | X | X | X | |
| DPD Colorimetric | 4500-Cl G | Hach Method 10260 ⁴ | X | X | X | |
| Syringaldazine (FACTS) | 4500-Cl H | | X | | | |
| Amperometric Sensor | | ChloroSense ³ | X | | X | |
| Online Chlorine Analyzer | | EPA 334.0 ² | X | | X | |
| Indophenol Colorimetric | | Hach Method 10241 ⁶ | X | X | X | |
| Iodometric Electrode | 4500-Cl I | | | | X | |
| DPD | 4500-ClO ₂ D | | | | | X |
| Amperometric Method II | 4500-ClO ₂ E | | | | | X |
| Lissamine Green Spectrophotometric | | EPA: 327.0 Rev. 1.1 | | | | X |
| Amperometric Sensor | | ChlordioX Plus ⁵ | | | | X |

The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register on February 16, 1999, in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408.

The following method is available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428:

Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996: Method D 1253-86.

The following methods are available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710:

Standard Methods for the Examination of Water and Wastewater, 19th (1995), 20th (1998), 21st (2005), and 22nd (2012) editions, American Public Health Association: Methods: 4500-Cl D, 4500-Cl E, 4500-Cl F, 4500-Cl G, 4500-Cl H, 4500-Cl I, 4500-ClO₂ E. Only the 19th and 20th editions may be used for the chlorine dioxide Method 4500-ClO₂ D.

The following methods are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847):

"Determination of Chlorine Dioxide and Chlorite Ion in Drinking Water Using Lissamine Green B and Horseradish Peroxidase with Detection by Visible Spectrophotometry, Revision 1.1," USEPA, May 2005, EPA 815-R-05-008.

¹X indicates method is approved for measuring specified residual disinfectant. Free chlorine or total chlorine may be measured for demonstrating compliance with the chlorine MRDL, and combined chlorine or total chlorine may be measured for demonstrating compliance with the chloramine MRDL.

²EPA Method 334.0, "Determination of Residual Chlorine in Drinking Water Using an On-Line Chlorine Analyzer," August 2009. EPA 815-B-09-013. Available at www.epa.gov/safewater/methods/analyticalmethods_ogwdw.html.

³ChloroSense, "Measurement of Free and Total Chlorine in Drinking Water by Palintest ChloroSense," September 2009. Available at www.nemi.gov or from Palintest Ltd., 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018.

⁴Hach Method 10260, "Determination of Chlorinated Oxidants (Free and Total) in Water Using Disposable Planar Reagent-Filled Cuvettes and Mesofluidic Channel Colorimetry," April 2013. Available at Hach Company, P.O. Box 389, Loveland, CO 80539, or www.hach.com.

⁵ChlordioX Plus. "Chlorine Dioxide and Chlorite in Drinking Water by Amperometry Using Disposable Sensors," November 2013. Available from Palintest Ltd., Jamike Avenue (Suite 100), Erlanger, KY 41018.

⁶Hach Company. "Hach Method 10241 – Spectrophotometric Measurement of Free Chlorine in Finished Drinking Water," November 2015, Revision 1.2. Available at www.hach.com.

(2) Test kit use. Systems may also measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide by using DPD colorimetric test kits acceptable to the department. Free and total chlorine residual disinfectant concentrations may be measured continuously by adapting a specified chlorine residual method for use with a continuous monitoring instrument provided the chemistry, accuracy, and precision remain the same. Instruments used for continuous monitoring must be calibrated with a grab sample measurement at least every five days.

(3) Operator requirement. Measurements for residual disinfectant concentration shall be conducted by a Grade A through IV operator meeting the requirements of 567—Chapter 81, any person under the direct supervision of a Grade A through IV operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform analysis under 567—Chapter 83.

e. Compliance requirements for residual disinfectants.

(1) General requirements.

1. When compliance is based on a running annual average of monthly or quarterly samples or averages and the system's failure to monitor makes it impossible to determine compliance with MRDLs for chlorine and chloramines, this failure to monitor will be treated as a monitoring violation for the entire period covered by the annual average.

2. All samples taken and analyzed under the provisions of this rule must be included in determining compliance, even if that number is greater than the minimum required.

(2) Chlorine and chloramines.

1. Compliance must be based on a running annual arithmetic average, computed quarterly, of monthly averages of all samples collected by the system under 43.6(1) "c"(2). If the average covering any consecutive four-quarter period exceeds the MRDL, the system is in violation of the MRDL and must notify the public pursuant to 567—42.1(455B), in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d."

2. In cases where systems switch between the use of chlorine and chloramines for residual disinfection during the year, compliance must be determined by including together all monitoring results of both chlorine and chloramines in calculating compliance. Reports submitted pursuant to 567—paragraph 42.4(3) "d" must clearly indicate which residual disinfectant was analyzed for each sample.

(3) Chlorine dioxide.

1. Acute violations. Compliance must be based on consecutive daily samples collected by the system under 43.6(1) "c"(3). If any daily sample taken at the entrance to the distribution system exceeds the MRDL, and on the following day one or more of the three samples taken in the distribution system exceed the MRDL, the system is in violation of the MRDL and shall take immediate corrective action to lower the level of chlorine dioxide below the MRDL and shall notify the public pursuant to the Tier 1 requirements in 567—subrule 42.1(2) in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d." Failure to take samples in the distribution system the day following an exceedance of the chlorine dioxide MRDL at the entrance to the distribution system will also be considered an MRDL violation and the system must notify the public of the violation in accordance with the provisions for Tier 1 violations in 567—subrule 42.1(2), in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d."

2. Nonacute violations. Compliance must be based on consecutive daily samples collected by the system under 43.6(1) "c"(3). If any two consecutive daily samples taken at the entrance to the distribution system exceed the MRDL and all distribution system samples taken are below the MRDL, the system is in violation of the MRDL and must take corrective action to lower the level of chlorine dioxide below the MRDL at the point of sampling and will notify the public pursuant to the Tier 2 requirements in 567—subrule 42.1(3), in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d." Failure to monitor at the entrance to the distribution system the day following an exceedance of the

chlorine dioxide MRDL at the entrance to the distribution system is also an MRDL violation and the system must notify the public of the violation in accordance with the provisions for Tier 2 violations in 567—subrule 42.1(3), in addition to reporting to the department pursuant to 567—paragraph 42.4(3)“d.”

f. Reporting requirements for disinfectants. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected. The specific reporting requirements for disinfectants are listed in 567—subparagraph 42.4(3)“d”(3).

43.6(2) Disinfection byproduct precursors.

a. Applicability.

(1) Surface water or IGW CWS and NTNC systems with conventional filtration. This rule establishes criteria under which surface water or influenced groundwater CWS and NTNC public water supply systems using conventional filtration treatment, as defined in 567—40.2(455B), that add a chemical disinfectant to the water in any part of the drinking water treatment process or which provide water that contains a chemical disinfectant must modify their practices to meet the MCLs listed in 567—41.6(455B) and the maximum residual disinfectant levels (MRDL) and treatment technique requirements for disinfection byproduct precursors listed in this rule.

(2) CWS and NTNC systems using ozone treatment. CWS and NTNC systems that use ozone in their treatment process must comply with the bromide requirements of this subrule.

(3) Compliance dates. Compliance dates for this rule are based upon the population served. CWS and NTNC systems using surface water or groundwater under the direct influence of surface water in whole or in part and which serve 10,000 or more persons must comply with this rule beginning January 1, 2002; while those systems serving fewer than 10,000 persons must comply with this rule beginning January 1, 2004.

(4) The department may require groundwater systems to conduct monitoring for disinfection byproduct precursors as a part of an operation permit.

b. Monitoring requirements for disinfection byproduct precursors.

(1) Routine monitoring for total organic carbon (TOC).

1. Surface water and groundwater under the direct influence of surface water systems which use conventional filtration treatment must monitor each treatment plant for total organic carbon (TOC) no later than at the point of combined filter effluent turbidity monitoring and representative of the treated water. The systems must also monitor for TOC in the source water prior to any treatment at the same time as monitoring for TOC in the treated water. These samples (source water and treated water) are referred to as paired samples. At the same time the source water sample is taken, all systems must monitor for alkalinity in the source water prior to any treatment. Systems must take one paired set of source water and treated water samples and one source water alkalinity sample per month per plant at a time representative of normal operating conditions and influent water quality.

2. Surface water and groundwater under the direct influence of surface water systems which do not use conventional filtration treatment must conduct the TOC monitoring under 43.6(2)“b”(1)“1” in order to qualify for reduced disinfection byproduct monitoring for TTHM and HAA5 under 567—paragraph 41.6(1)“c”(4)“2.” The source water TOC running annual average must be less than or equal to 4.0 mg/L based on the most recent four quarters of monitoring on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. Once qualified for reduced monitoring for TTHM and HAA5, a system may reduce source water TOC monitoring to quarterly TOC samples taken every 90 days at a location prior to any treatment.

(2) Reduced monitoring. The department may allow surface water and groundwater under the direct influence of surface water systems with an average treated water TOC of less than 2.0 mg/L for two consecutive years, or less than 1.0 mg/L for one year, to reduce monitoring for both TOC and alkalinity to one set of paired samples and one source water alkalinity sample per plant per quarter. The system must revert to routine monitoring in the month following the quarter when the annual average treated water TOC is greater than or equal to 2.0 mg/L.

(3) Bromide. The department may allow systems required to analyze for bromate to reduce bromate monitoring from monthly to once per quarter, if the system demonstrates that the average source water bromide concentration is less than 0.05 mg/L based upon representative monthly measurements for one year. The system must continue bromide monitoring to remain on reduced bromate monitoring.

(4) The department may assign disinfection byproduct precursor monitoring prior to the compliance dates in 43.6(2)“a”(3) as part of an operation permit.

c. Analytical requirements for disinfection byproduct precursors.

(1) Analytical methods. Systems required to monitor disinfectant byproduct precursors must use the following methods, which must be conducted by a certified laboratory pursuant to 567—Chapter 83, unless otherwise specified.

Approved Methods for Disinfection Byproduct Precursor Monitoring¹

| Analyte | Methodology | EPA | Standard Methods | ASTM | Other |
|---|--|--------------------------------|------------------------|------------|--------------------------------|
| Alkalinity ⁶ | Titrimetric | | 2320B | D 1067-92B | |
| | Electrometric titration | | | | I-1030-85 |
| Bromide | Ion chromatography | 300.0 | | | |
| | | 300.1 | | | |
| | | 317.0 Rev. 2.0 | | | |
| | | 326.0 | | | |
| | | | | D 6581-00 | |
| Dissolved Organic Carbon ² (DOC) | High temperature combustion | 415.3 Rev. 1.2 | 5310B or 5310B-00 | | |
| | Persulfate-UV or heated-persulfate oxidation | 415.3 Rev. 1.2 | 5310C or 5310C-00 | | |
| | Wet oxidation | 415.3 Rev. 1.1, 415.3 Rev. 1.2 | 5310D or 5310D-00 | | |
| pH ³ | Electrometric | 150.1 | 4500-H ⁺ -B | D 1293-84 | |
| | | 150.2 | | | |
| Specific Ultraviolet Absorbance (SUVA) | Calculation using DOC and UV ₂₅₄ data | 415.3 Rev. 1.2 | | | |
| Total Organic Carbon ⁴ | High temperature combustion | 415.3 Rev. 1.2 | 5310B or 5310B-00 | | |
| | Persulfate-UV or heated-persulfate oxidation | 415.3 Rev. 1.2 | 5310C or 5310C-00 | | Hach Method 10267 ⁷ |
| | Wet oxidation | 415.3 Rev. 1.1, 415.3 Rev. 1.2 | 5310D or 5310D-00 | | |
| | Ozone Oxidation | | | | Hach Method 10261 ⁸ |
| Ultraviolet Absorption at 254 nm ⁵ | Spectrophotometry | 415.3 Rev. 1.1, 415.3 Rev. 1.2 | 5910B or 5910B-00, 11 | | |

¹The procedures shall be done in accordance with the documents listed below. The incorporation by reference of the following documents was approved by the Director of the Federal Register on February 16, 1999, in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at (800)426-4791. Documents may be inspected at EPA's Drinking Water Docket, 401 M Street, SW, Washington, DC 20460 (telephone: (202)260-3027); or at the Office of Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408.

The following methods are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428:

Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 1996: Method D 1067-92B and Method D 1293-84.

Annual Book of ASTM Standards, Volume 11.01, American Society for Testing and Materials, 2001 (or any year containing the cited version): Method D 6581-00.

The following methods are available from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161 (telephone: (800)553-6847):

“Determination of Inorganic Anions in Drinking Water by Ion Chromatography, Revision 1.0,” EPA-600/R-98/118, 1997 (NTIS, PB98-169196): Method 300.1.

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983, (NTIS PB84-128677): Methods 150.1 and 150.2.

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA-600/R-93/100, August 1993, (NTIS PB94-121811): Method 300.0.

“Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography with the Addition of a Postcolumn Reagent for Trace Bromate Analysis, Revision 2.0,” USEPA, July 2001, EPA 815-B-01-001: Method 317.0.

“Determination of Inorganic Oxyhalide Disinfection By-Products in Drinking Water Using Ion Chromatography Incorporating the Addition of a Suppressor Acidified Postcolumn Reagent for Trace Bromate Analysis, Revision 1.0,” USEPA, June 2002, EPA 815-R-03-007: Method 326.0.

“Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water, Revision 1.1,” USEPA, February 2005, EPA/600/R-05/055: Method 415.3 Revision 1.1.

“Determination of Total Organic Carbon and Specific UV Absorbance at 254 nm in Source Water and Drinking Water, Revision 1.2,” USEPA, September 2009, EPA/600/R-09/122: Method 415.3 Revision 1.2.

The following methods are available from the American Public Health Association, 800 I Street, NW, Washington, DC 20001-3710:

Standard Methods for the Examination of Water and Wastewater, 19th (1995), 21st (2005), and 22nd (2012) editions, American Public Health Association: Methods: 2320B (20th edition, 1998, is also accepted for this method), 4500-H⁺-B, and 5910B (22nd edition, 2012, is also accepted for this method).

Standard Methods for the Examination of Water and Wastewater, Supplement to the 19th edition (1996), 21st (2005), and 22nd editions, American Public Health Association: Methods: 5310B, 5310C, and 5310D.

For method numbers ending “-00”, the year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that are IBR-approved.

Method I-1030-85 is available from the Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225-0425.

²Dissolved Organic Carbon (DOC). DOC and UV₂₅₄ samples used to determine a SUVA value must be taken at the same time and at the same location, prior to the addition of any disinfectant or oxidant by the system. Prior to analysis, DOC samples must be filtered through a 0.45 μ pore-diameter filter, as soon as practical after sampling, not to exceed 48 hours. After filtration, DOC samples must be acidified to achieve pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified DOC samples must be analyzed within 28 days. Inorganic carbon must be removed from the samples prior to analysis. Water passed through the filter prior to filtration of the sample must serve as the filtered blank. This filtered blank must be analyzed using procedures identical to those used for analysis of the samples and must meet a DOC concentration of <0.5 mg/L.

³pH must be measured by a laboratory certified by the department to perform analysis under 567—Chapter 83; a Grade II, III or IV operator meeting the requirements of 567—Chapter 81; or any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81.

⁴Total Organic Carbon (TOC). Inorganic carbon must be removed from the samples prior to analysis. TOC samples may not be filtered prior to analysis. TOC samples must be acidified at the time of sample collection to achieve a pH less than or equal to 2 with minimal addition of the acid specified in the method or by the instrument manufacturer. Acidified TOC samples must be analyzed within 28 days.

⁵Ultraviolet Absorption at 254 nm (UV₂₅₄). DOC and UV₂₅₄ samples used to determine a SUVA value must be taken at the same time and at the same location, prior to the addition of any disinfectant or oxidant by the system. UV absorption must be measured at 253.7 nm (may be rounded off to 254 nm). Prior to analysis, UV₂₅₄ samples must be filtered through a 0.45 μ pore-diameter filter. The pH of UV₂₅₄ samples may not be adjusted. Samples must be analyzed as soon as practical after sampling, not to exceed 48 hours.

⁶Alkalinity must be measured by a laboratory certified by the department to perform analysis under 567—Chapter 83; a Grade II, III or IV operator meeting the requirements of 567—Chapter 81; or any person under the supervision of a Grade II, III or IV operator meeting the requirements of 567—Chapter 81. Only the listed titrimetric methods are acceptable.

⁷Hach Company. "Hach Method 10267 – Spectrophotometric Measurement of Total Organic Carbon (TOC) in Finished Drinking Water," December 2015, Revision 1.2. Available at www.hach.com.

⁸Hach Company. "Hach Method 10261 – Total Organic Carbon in Finished Drinking Water by Catalyzed Ozone Hydroxyl Radical Oxidation Infrared Analysis," December 2015, Revision 1.2. Available at www.hach.com.

(2) SUVA. Specific Ultraviolet Absorbance (SUVA) is equal to the UV absorption at 254nm (UV₂₅₄) (measured in m⁻¹) divided by the dissolved organic carbon (DOC) concentration (measured as mg/L). In order to determine SUVA, it is necessary to separately measure UV₂₅₄ and DOC. When determining SUVA, systems must use the methods stipulated in subparagraph 43.6(1) "c"(1) to measure DOC and UV₂₅₄. SUVA must be determined on water prior to the addition of disinfectants/oxidants by the system. DOC and UV₂₅₄ samples used to determine an SUVA value must be taken at the same time and at the same location.

(3) Magnesium. All methods approved for magnesium in 567—subparagraph 41.3(1) "e"(1) are approved for use in measuring magnesium under this rule.

d. Compliance requirements for disinfection byproduct precursors.

(1) General requirements. All samples taken and analyzed under the provisions of this rule must be included in determining compliance, even if that number is greater than the minimum required.

(2) Compliance determination. Compliance must be determined as specified by 43.6(3) "c." The department may assign monitoring through an operation permit, or systems may begin monitoring to determine whether Step 1 TOC removals can be met 12 months prior to the compliance date for the system. This monitoring is not required and failure to monitor during this period is not a violation. However, any system that does not monitor during this period and then determines in the first 12 months after the compliance date that it is not able to meet the Step 1 requirements in 43.6(3) "b"(2), and must therefore apply for alternate minimum TOC removal (Step 2) requirements, is not eligible for retroactive approval of alternate minimum TOC removal (Step 2) requirements as allowed pursuant to 43.6(3) "b"(3) and is in violation. Systems may apply for alternate minimum TOC removal (Step 2) requirements anytime after the compliance date. For systems required to meet Step 1 TOC removals, if the value calculated under 43.6(3) "c"(1) "4" is less than 1.00, the system is in violation of the treatment technique requirements and must notify the public pursuant to 567—42.1(455B), in addition to reporting to the department pursuant to 567—paragraph 42.4(3) "d."

e. Reporting requirements for disinfection byproduct precursors. Systems required to sample quarterly or more frequently must report to the department within ten days after the end of each quarter in which samples were collected, notwithstanding the public notification provisions of 567—42.1(455B). Systems required to sample less frequently than quarterly must report to the department within ten days after the end of each monitoring period in which samples were collected. The specific reporting requirements for disinfection byproduct precursors are listed in 567—subparagraph 42.4(3) "d"(4).

43.6(3) Treatment technique for control of disinfection byproduct precursors.

a. Applicability.

(1) Systems using surface water or groundwater under the direct influence of surface water and conventional filtration treatment (as defined in 567—40.2(455B)) must operate with enhanced coagulation or enhanced softening to achieve the TOC percent removal levels specified in paragraph "b" of this subrule unless the system meets at least one of the alternative compliance criteria listed in 43.6(3) "a"(2) or (3).

(2) Alternative compliance criteria for enhanced coagulation and enhanced softening systems. Systems using surface water or groundwater under the direct influence of surface water and conventional filtration treatment may use the alternative compliance criteria in 43.6(3) "a"(2) "1" through "6" to comply with this subrule in lieu of complying with 43.6(3) "b." Systems must still comply with monitoring requirements in 43.6(2) "b."

1. The system's source water TOC level, measured according to 43.6(2) "c"(1), is less than 2.0 mg/L, calculated quarterly as a running annual average.

2. The system's treated water TOC level, measured according to 43.6(2) "c"(1), is less than 2.0 mg/L, calculated quarterly as a running annual average.

3. The system's source water TOC level, measured according to 43.6(2) "c"(1), is less than 4.0 mg/L, calculated quarterly as a running annual average; the source water alkalinity, measured according to 43.6(2) "c"(1), is greater than 60 mg/L as CaCO₃, calculated quarterly as a running annual average; and either the TTHM and HAA5 running annual averages are no greater than 0.040 mg/L and 0.030 mg/L, respectively; or prior to the effective date for compliance in 567—subparagraph 41.6(1) "a"(3) and in 43.6(1) "a"(3) and 43.6(2) "a"(3), the system has made a clear and irrevocable financial commitment not later than the effective date for compliance in 567—subparagraph 41.6(1) "a"(3) and in 43.6(1) "a"(3) and 43.6(2) "a"(3), to use of technologies that will limit the levels of TTHMs and HAA5 to no more than 0.040 mg/L and 0.030 mg/L, respectively. Systems must submit evidence of a clear and irrevocable financial commitment, in addition to a schedule containing milestones and periodic progress reports for installation and operation of appropriate technologies, to the department for approval not later than the effective date for compliance in 567—subparagraph 41.6(1) "a"(3) and in 43.6(1) "a"(3) and 43.6(2) "a"(3). These technologies must be installed and operating not later than June 30, 2005. Failure to install and operate these technologies by the date in the approved schedule will constitute a treatment technique violation.

4. The TTHM and HAA5 running annual averages are less than or equal to 0.040 mg/L and 0.030 mg/L, respectively, and the system uses only chlorine for primary disinfection and maintenance of a residual in the distribution system.

5. The system's source water SUVA, prior to any treatment and measured monthly according to 43.6(2) "c," is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

6. The system's finished water SUVA, measured monthly according to 43.6(2) "c," is less than or equal to 2.0 L/mg-m, calculated quarterly as a running annual average.

(3) Additional alternative compliance criteria for softening systems. Systems practicing enhanced softening that cannot achieve the TOC removals required by 43.6(3) "b"(2) may use the alternative compliance criteria in 43.6(3) "a"(3) "1" and "2" in lieu of complying with 43.6(3) "b." Systems must still comply with monitoring requirements in 43.6(2) "b."

1. Softening that lowers the treated water alkalinity to less than 60 mg/L as CaCO₃, measured monthly according to 43.6(2) "c" and calculated quarterly as a running annual average.

2. Softening that removes at least 10 mg/L of magnesium hardness as CaCO₃, measured monthly and calculated quarterly as a running annual average.

b. Enhanced coagulation and enhanced softening performance requirements.

(1) Systems must achieve the percent reduction of TOC specified in 43.6(3) "b"(2) between the source water and the combined filter effluent, unless the department approves a system's request for alternate minimum TOC removal (Step 2 requirements under 43.6(3) "b"(3)).

(2) Required Step 1 TOC reductions, indicated in the following table, are based upon specified source water parameters measured in accordance with 43.6(2) "c." Systems using softening are required to meet the Step 1 TOC reductions in the right-hand column (Source water alkalinity > 120 mg/L) for the specified source water TOC:

Step 1 Required Removal of TOC by Enhanced Coagulation and Enhanced Softening for Surface Water or IGW Systems Using Conventional Treatment^{1,2}

| Source water TOC, mg/L | Source water Alkalinity, mg/L as CaCO ₃ | | |
|------------------------|--|---------|-------------------|
| | 0-60 | >60-120 | >120 ³ |
| >2.0 - 4.0 | 35.0% | 25.0% | 15.0% |
| >4.0 - 8.0 | 45.0% | 35.0% | 25.0% |
| >8.0 | 50.0% | 40.0% | 30.0% |

¹Systems meeting at least one of the conditions in 43.6(3) "a"(2) "1" to "6" are not required to operate with enhanced coagulation.

²Softening systems meeting one of the alternative compliance criteria in 43.6(3) "a"(3) are not required to operate with enhanced softening.

³Systems practicing softening must meet the TOC removal requirements in this column.

(3) Surface water and groundwater under the influence of surface water systems using conventional treatment that cannot achieve the Step 1 TOC removals required by 43.6(3)“b”(2) due to water quality parameters or operational constraints must apply to the department for approval of alternative minimum Step 2 TOC removal requirements submitted by the system within three months of failure to achieve the TOC removals required by 43.6(3)“b”(2). If the department approves the alternative minimum Step 2 TOC removal requirements, the department may make those requirements retroactive for the purposes of determining compliance. The system must meet the Step 1 TOC removals contained in 43.6(3)“b”(2) until the department approves the alternate minimum Step 2 TOC removal requirements.

(4) Alternate minimum Step 2 TOC removal requirements. Applications made to the department by enhanced coagulation systems for approval of alternate minimum Step 2 TOC removal requirements under 43.6(3)“b”(3) must include, as a minimum, results of bench-scale or pilot-scale testing conducted under 43.6(3)“b”(4)“1” below and be used to determine the alternate enhanced coagulation level.

1. Alternate enhanced coagulation level. Alternate enhanced coagulation level is defined as coagulation at a coagulant dose and pH as determined by the method described in 43.6(3)“b”(4)“1” to “5” such that an incremental addition of 10 mg/L of alum (or equivalent amount of ferric salt) results in a TOC removal of less than or equal to 0.3 mg/L. The percent removal of TOC at this point on the “TOC removal versus coagulant dose” curve is then defined as the minimum TOC removal required for the system. Once approved by the department, this minimum requirement supersedes the minimum TOC removal required by the table in 43.6(3)“b”(2). This requirement will be effective until such time as the department approves a new value based on the results of a new bench-scale or pilot-scale test. Failure to achieve department-set alternative minimum TOC removal levels is a treatment technique violation.

2. Bench-scale or pilot-scale testing of enhanced coagulation must be conducted by using representative water samples and adding 10 mg/L increments of alum (or equivalent amounts of ferric salt) until the pH is reduced to a level less than or equal to the enhanced coagulation Step 2 target pH shown in the following table:

Enhanced Coagulation Step 2 Target pH

| Alkalinity (mg/L as CaCO ₃) | Target pH |
|---|-----------|
| 0-60 | 5.5 |
| >60-120 | 6.3 |
| >120-240 | 7.0 |
| >240 | 7.5 |

3. For waters with alkalinities of less than 60 mg/L for which addition of small amounts of alum or equivalent addition of iron coagulant drives the pH below 5.5 before significant TOC removal occurs, the system must add necessary chemicals to maintain the pH between 5.3 and 5.7 in samples until the TOC removal of 0.3 mg/L per 10 mg/L alum added (or equivalent addition of iron coagulant) is reached.

4. The system may operate at any coagulant dose or pH necessary (consistent with other public drinking water rules in 567—Chapters 41 through 43) to achieve the minimum TOC percent removal approved under 43.6(3)“b”(3).

5. If the TOC removal is consistently less than 0.3 mg/L of TOC per 10 mg/L of incremental alum dose at all dosages of alum (or equivalent addition of iron coagulant), the water is deemed to contain TOC not amenable to enhanced coagulation. The system may then apply to the department for a waiver of enhanced coagulation requirements.

c. Compliance calculations.

(1) Surface water or groundwater under the influence of surface water systems other than those identified in 43.6(3)“a”(2) or (3) must comply with requirements contained in 43.6(3)“b”(2) or (3). Systems must calculate compliance quarterly, beginning after the system has collected 12 months of data, by determining an annual average using the following method:

1. Step 1: Determine actual monthly TOC percent removal using the following equation, to two decimal places:

$$\text{Actual monthly TOC percent removal} = 1 - \left(\frac{\text{treated water TOC}}{\text{source water TOC}} \right) \times 100$$

2. Step 2: Determine the required monthly TOC percent removal from either 43.6(3) “b”(2) or (3).

3. Step 3: Divide the “actual monthly TOC percent removal” value (from Step 1) by the “required monthly TOC percent removal” value (from Step 2). Determine this value for each of the last 12 months.

$$\text{Monthly percent removal ratio} = \frac{\text{actual monthly TOC percent removal}}{\text{required monthly TOC percent removal}}$$

4. Step 4: Add together the “monthly percent removal ratio” values from Step 3 for each of the last 12 months and divide by 12, to determine the annual average value.

$$\text{Annual average} = \frac{\sum \text{monthly percent removal ratio}}{12}$$

5. Step 5: If the “annual average” value calculated in Step 4 is less than 1.00, the system is not in compliance with the TOC percent removal requirements.

(2) Systems may use the provisions in 43.6(3) “c”(2)“1” through “5” in lieu of the calculations in 43.6(3) “c”(1)“1” through “5” to determine compliance with TOC percent removal requirements.

1. In any month that the system’s treated or source water TOC level, measured according to 43.6(2) “c”(1), is less than 2.0 mg/L, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3) “c”(1)“3”) when calculating compliance under the provisions of 43.6(3) “c”(1).

2. In any month that a system practicing softening removes at least 10 mg/L of magnesium hardness as CaCO₃, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3) “c”(1)“3”) when calculating compliance under the provisions of 43.6(3) “c”(1).

3. In any month that the system’s source water SUVA, prior to any treatment and measured according to 43.6(2) “c”(2), is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3) “c”(1)“3”) when calculating compliance under the provisions of 43.6(3) “c”(1).

4. In any month that the system’s finished water SUVA, measured according to 43.6(2) “c”(2), is less than or equal to 2.0 L/mg-m, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3) “c”(1)“3”) when calculating compliance under the provisions of 43.6(3) “c”(1).

5. In any month that a system using enhanced softening lowers alkalinity below 60 mg/L as CaCO₃, the system may assign a monthly value of 1.0 (in lieu of the value calculated in 43.6(3) “c”(1)“3”) when calculating compliance under the provisions of 43.6(3) “c”(1).

(3) Surface water or groundwater under the direct influence of surface water systems using conventional treatment may also comply with the requirements of this subrule by meeting the criteria in 43.6(3) “a”(2) or (3).

d. Treatment technique requirements for disinfection byproduct precursors. The treatment techniques to control the level of disinfection byproduct precursors in drinking water treatment and distribution systems, for surface water or groundwater under the direct influence of surface water systems using conventional filtration treatment, are enhanced coagulation or enhanced softening.

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.7(455B) Lead and copper treatment techniques.

43.7(1) Corrosion control treatment for lead and copper control.

a. Applicability. Systems shall complete the applicable corrosion control treatment requirements by the deadlines specified in the following rules:

(1) Large systems serving more than 50,000 persons. A large system (serving greater than 50,000 persons) shall complete the corrosion control treatment steps specified in 43.7(1)“d,” unless the system is deemed to have optimized corrosion control under 43.7(1)“b”(2) or (3).

(2) Small and medium-size systems serving 50,000 or fewer persons. A small system (serving less than or equal to 3,300 persons) or a medium-size system (serving greater than 3,300 and less than or equal to 50,000 persons) shall complete the corrosion control treatment steps specified in 43.7(1)“e,” unless the system has optimized corrosion control under 43.7(1)“b”(1), (2), or (3).

b. Determination that a system has optimized corrosion control. A public water supply system has optimized corrosion control and is not required to complete the applicable corrosion control treatment steps identified in this subrule if the system satisfies one of the criteria specified in subparagraphs 43.7(1)“b”(1) through (3). Any such system deemed to have optimized corrosion control under this paragraph and which has treatment in place shall continue to operate and maintain optimal corrosion control treatment and meet any requirements that the department determines appropriate to ensure optimal corrosion control treatment is maintained.

(1) A small or medium-size water supply system has optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods, conducted in accordance with 567—paragraph 41.4(1)“c.”

(2) Any public water supply system may be deemed to have optimized corrosion control treatment if the system demonstrates to the satisfaction of the department that it has conducted activities equivalent to the corrosion control steps applicable to such system under this subrule. If the department makes this determination, it shall provide the water supply system with written notice explaining the basis for its decision and shall specify the water quality control parameters representing optimal corrosion control in accordance with 43.7(2)“f.” Systems deemed to have optimized corrosion control under this paragraph shall operate in compliance with the department-designated optimal water quality control parameters in accordance with paragraph 43.7(1)“g” and continue to conduct lead and copper tap and water quality parameter sampling in accordance with 567—paragraph 41.4(1)“c”(4)“3” and 567—subparagraph 41.4(1)“d”(4), respectively. A system shall provide the department with the following information in order to support a determination under this paragraph:

1. The results of all test samples collected for each of the water quality parameters in 43.7(2)“c”(3);

2. A report explaining the test methods used by the water system to evaluate the corrosion control treatments listed in 43.7(2)“c”(1), the results of all tests conducted, and the basis for the system’s selection of optimal corrosion control treatment;

3. A report explaining how corrosion control was installed and how it is being maintained to ensure minimal lead and copper concentrations at consumers’ taps; and

4. The results of tap water samples collected in accordance with 567—paragraph 41.4(1)“c” at least once every six months for one year after corrosion control has been installed.

(3) Any water system has optimized corrosion control if it submits results of tap water monitoring conducted in accordance with 567—paragraph 41.4(1)“c” and source water monitoring conducted in accordance with 567—paragraph 41.4(1)“e” that demonstrate for two consecutive six-month monitoring periods that the difference between the 90th percentile tap water lead level computed under 567—subparagraph 41.4(1)“b”(3) and the highest source water lead concentration is less than the practical quantitation level for lead specified in 567—paragraph 41.4(1)“g.”

1. Those systems whose highest source water lead level is below the method detection limit may also be deemed to have optimized corrosion control under this paragraph if the 90th percentile tap water lead level is less than or equal to the practical quantitation level for lead for two consecutive six-month monitoring periods.

2. Any water system deemed to have optimized corrosion control in accordance with this paragraph shall continue monitoring for lead and copper at the tap no less frequently than once every three calendar years using the reduced number of sites specified in 567—subparagraph 41.4(1)“c”(3) and collecting the samples at times and locations specified in 567—paragraph 41.4(1)“c”(4)“4,” fourth bulleted paragraph.

3. Any water system deemed to have optimized corrosion control pursuant to this paragraph shall notify the department in writing pursuant to 567—subparagraph 42.4(2) “a”(3) of any upcoming long-term change in treatment or the addition of a new source as described in 567—subparagraph 42.4(2) “a”(3). The department must review and approve the addition of a new source or long-term change in water treatment before it is implemented by the water system.

4. Unless a system meets the copper action level, it is not deemed to have optimized corrosion control under this paragraph and shall implement corrosion control treatment pursuant to 43.7(1) “b”(3) “5.”

5. Any system triggered into corrosion control because it is no longer deemed to have optimized corrosion control under this paragraph shall implement corrosion control treatment in accordance with the deadlines in paragraph 43.7(1) “e.” Any such large system shall adhere to the schedule specified in that paragraph for medium-size systems, with the time periods for completing each step being triggered by the date the system is no longer deemed to have optimized corrosion control under this paragraph.

c. Requirements to recommence corrosion control steps. Any small or medium-size water system that is required to complete the corrosion control steps due to its exceedance of the lead or copper action level may cease completing the treatment steps whenever the system meets both action levels during each of two consecutive monitoring periods conducted pursuant to 567—paragraph 41.4(1) “c” and submits the results to the department. If any such water system thereafter exceeds the lead or copper action level during any monitoring period, the system shall recommence completion of the applicable treatment steps, beginning with the first treatment step which was not previously completed in its entirety. The department may require a system to repeat treatment steps previously completed by the system when it is determined by the department that this is necessary to implement properly the treatment requirements of this rule. The department will notify the system in writing of such a determination and explain the basis for its decision. The requirement for any small or medium-size system to implement corrosion control treatment steps in accordance with 43.7(1) “e” (including systems deemed to have optimized corrosion control under 43.7(1) “b”(1)) is triggered whenever any small or medium-size system exceeds the lead or copper action level.

d. Treatment steps and deadlines for large systems. Except as provided in 43.7(1) “b”(2) or (3), large systems shall complete the following corrosion control treatment steps (described in the referenced portions of 43.7(1) “b,” subrule 43.7(2), and 567—paragraphs 41.4(1) “c” and “d”) by the dates indicated below.

(1) Step 1. The system shall conduct initial monitoring pursuant to 567—paragraph 41.4(1) “c”(4) “1” and 567—subparagraph 41.4(1) “d”(2) during two consecutive six-month monitoring periods by January 1, 1993.

(2) Step 2. The system shall complete corrosion control studies pursuant to 43.7(2) “c” by July 1, 1994.

(3) Step 3. The department will designate optimal corrosion control treatment within six months of receiving the corrosion control study results (by January 1, 1995).

(4) Step 4. The system shall install optimal corrosion control treatment by January 1, 1997.

(5) Step 5. The system shall complete follow-up sampling pursuant to 567—paragraph 41.4(1) “c”(4) “2” and 567—subparagraph 41.4(1) “d”(3) by January 1, 1998.

(6) Step 6. The department will review installation of treatment and designate optimal water quality control parameters pursuant to 43.7(2) “f” by July 1, 1998.

(7) Step 7. The system shall operate in compliance with optimal water quality control parameters delineated by the department and continue to conduct tap sampling.

e. Treatment steps and deadlines for small and medium-size systems. Except as provided in 43.7(2), small and medium-size systems shall complete the following corrosion control treatment steps (described in subrule 43.7(2) and 567—paragraphs 41.4(1) “c” and “d”) by the indicated time periods listed below.

(1) Step 1. The system shall conduct initial tap sampling pursuant to 567—paragraph 41.4(1) “c”(4) “1” and 567—subparagraph 41.4(1) “d”(2) until the system either exceeds the lead or copper action level or becomes eligible for reduced monitoring under 567—paragraph 41.4(1) “c”(4) “4.”

A system exceeding the lead or copper action level shall recommend optimal corrosion control treatment under 43.7(2)“a” within six months after the end of the monitoring period during which it exceeds one of the action levels.

(2) Step 2. Within 12 months after the end of the monitoring period during which a system exceeds the lead or copper action level, the department may require the system to perform corrosion control studies under 43.7(2)“b.” If the system is not required to perform such studies, the department will specify optimal corrosion control treatment under 43.7(2)“d” as follows: for medium-size systems, within 18 months after the end of the monitoring period during which such system exceeds the lead or copper action level, and, for small systems, within 24 months after the end of the monitoring period during which such system exceeds the lead or copper action level.

(3) Step 3. If a system is required to perform corrosion control studies under Step 2, the system shall complete the studies (under 43.7(2)“c”) within 18 months after such studies are required to commence.

(4) Step 4. If the system has performed corrosion control studies under Step 2, the department will designate optimal corrosion control treatment under 43.7(2)“d” within six months after completion of Step 3.

(5) Step 5. The system shall install optimal corrosion control treatment under 43.7(2)“e” within 24 months after such treatment is designated.

(6) Step 6. The system shall complete follow-up sampling pursuant to 567—paragraph 41.4(1)“c”(4)“2” and 567—subparagraph 41.4(1)“d”(3) within 36 months after optimal corrosion control treatment is designated.

(7) Step 7. The department will review the system’s installation of treatment and designate optimal water quality control parameters pursuant to 43.7(2)“f” within six months after completion of Step 6.

(8) Step 8. The system shall operate in compliance with the department-designated optimal water quality control parameters under 43.7(2)“f” (and continue to conduct tap sampling as per 567—paragraph 41.4(1)“c”(4)“3” and 567—subparagraph 41.4(1)“d”(4)).

43.7(2) Description of corrosion control treatment requirements. Each public water supply system shall complete the corrosion control treatment requirements described below which are applicable to such systems under 43.7(1).

a. Public water supply system recommendation regarding corrosion control treatment. Based upon the results of lead and copper tap monitoring and water quality parameter monitoring, small and medium-size water systems exceeding the lead or copper action level shall recommend installation of one or more of the corrosion control treatments listed in 43.7(2)“c” which the system believes constitute optimal corrosion control for that system. The department may require the system to conduct additional water quality parameter monitoring in accordance with 567—subparagraph 41.4(1)“d”(2) to assist in reviewing the system’s recommendation.

b. Department decision to require studies of corrosion control treatment (applicable to small and medium-size systems). The department may require any small or medium-size system that exceeds the lead or copper action level to perform corrosion control studies under 43.7(2)“c” to identify optimal corrosion control treatment for the system.

c. Performance of corrosion control studies.

(1) Any public water supply system performing corrosion control studies shall evaluate the effectiveness of each of the following treatments and, if appropriate, combinations of the following treatments to identify the optimal corrosion control treatment: alkalinity and pH adjustment; calcium hardness adjustment; and the addition of a phosphate or silicate-based corrosion inhibitor at a concentration sufficient to maintain an effective residual concentration in all test tap samples.

(2) The water system shall evaluate each of the corrosion control treatments using either pipe rig/loop tests, metal coupon tests, partial-system tests, or analyses based on documented analogous treatments with other systems of similar size, water chemistry and distribution system configuration.

(3) The public water supply system shall measure the following water quality parameters in any tests conducted under this paragraph before and after evaluating the corrosion control treatments listed above:

1. Lead;

2. Copper;
3. pH;
4. Alkalinity;
5. Calcium;
6. Conductivity;
7. Orthophosphate (when an inhibitor containing a phosphate compound is used);
8. Silicate (when an inhibitor containing a silicate compound is used);
9. Water temperature.

(4) The public water supply system shall identify all chemical or physical constraints that limit or prohibit the use of a particular corrosion control treatment and outline such constraints with the following: data and documentation showing that a particular corrosion control treatment has adversely affected other water treatment processes when used by another water system with comparable water quality characteristics; or data and documentation demonstrating that the water system has previously attempted to evaluate a particular corrosion control treatment and has found that the treatment is ineffective or adversely affects other water quality treatment processes.

(5) The water system shall evaluate the effect of the chemicals used for corrosion control treatment on other water quality treatment processes.

(6) On the basis of an analysis of the data generated during each evaluation, the water system shall recommend in writing to the department the treatment option that the corrosion control studies indicate constitutes optimal corrosion control treatment for that system. The water system shall provide a rationale for its recommendation along with all supporting documentation required by 43.7(2) "c"(1) through (5).

d. Department designation of optimal corrosion control treatment.

(1) Based upon consideration of available information including, where applicable, studies performed under 43.7(2) "c" and a system's recommended treatment alternative, the department will either approve the corrosion control treatment option recommended by the public water supply system, or designate alternative corrosion control treatment(s) from among those listed in 43.7(2) "c." The department will consider the effects that additional corrosion control treatment will have on water quality parameters and on other water quality treatment processes (when designating optimal corrosion control treatment).

(2) The department will notify the public water supply system of its decision on optimal corrosion control treatment in writing and explain the basis for this determination. If the department requests additional information to aid its review, the public water supply system shall provide the information.

e. Installation of optimal corrosion control. Each public water supply system shall properly install and operate throughout its distribution system the optimal corrosion control treatment designated under 43.7(2) "d."

f. Department review of treatment and specification of optimal water quality control parameters.

(1) The department will evaluate the results of all lead and copper tap samples and water quality parameter samples submitted by the public water supply system and determine whether the system has properly installed and operated the optimal corrosion control treatment designated in 43.7(2) "d." Upon reviewing the results of tap water and water quality parameter monitoring by the public water supply system, both before and after the system installs optimal corrosion control treatment, the department will designate the following:

1. A minimum value or a range of values for pH measured at each entry point to the distribution system;

2. A minimum pH value, measured in all tap samples. Such value shall be equal to or greater than 7.0 unless meeting a pH level of 7.0 is not technologically feasible or is not necessary for the public water supply system to optimize corrosion control;

3. If a corrosion inhibitor is used, a minimum concentration or a range of concentrations for the inhibitor, measured at each entry point to the distribution system and in all tap samples, necessary to form a passivating film on the interior walls of the pipes of the distribution system;

4. If alkalinity is adjusted as part of optimal corrosion control treatment, a minimum concentration or a range of concentrations for alkalinity, measured at each entry point to the distribution system and in all tap samples; or

5. If calcium carbonate stabilization is used as part of corrosion control, a minimum concentration or a range of concentrations for calcium, measured in all tap samples.

(2) The values for the applicable water quality control parameters listed above shall be those which reflect optimal corrosion control treatment for the public water supply system. The department may designate values for additional water quality control parameters determined by the department to reflect optimal corrosion control for the system. The department will notify the system in writing of these determinations and explain the basis for its decisions.

g. Continued operation with optimized corrosion control and water quality parameter monitoring compliance determination. All systems optimizing corrosion control shall continue to operate and maintain optimal corrosion control treatment, including maintaining water quality parameters at or above minimum values or within ranges designated by the department under paragraph 43.7(2) "f," in accordance with this paragraph for all samples collected under 567—subparagraphs 41.4(1) "d"(4) through (6). Compliance with the requirements of this paragraph shall be determined every six months, as specified under 567—subparagraph 41.4(1) "d"(4). A water system is out of compliance with the requirements of this paragraph for a six-month period if it has excursions for any department-specified parameter on more than nine days during the period. An excursion occurs whenever the daily value for one or more of the water quality parameters measured at a sampling location is below the minimum value or outside the range designated by the department. Daily values are calculated as follows. The department has the discretion to invalidate results of obvious sampling errors from this calculation.

(1) On days when more than one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the average of all results collected during the day regardless of whether they are collected through continuous monitoring, grab sampling, or a combination of both.

(2) On days when only one measurement for the water quality parameter is collected at the sampling location, the daily value shall be the result of that measurement.

(3) On days when no measurement is collected for the water quality parameter at the sampling location, the daily value shall be the daily value calculated on the most recent day on which the water quality parameter was measured at the sample site.

h. Modification of department treatment decisions. A determination of the optimal corrosion control treatment under 43.7(2) "d" or optimal water quality control parameters under 43.7(2) "f" may be modified. A request for modification by a public water supply system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The department may modify its determination when it concludes that such change is necessary to ensure that the public water supply system continues to optimize corrosion control treatment. A revised determination will be made in writing, which will set forth the new treatment requirements, explain the basis for the decision, and provide an implementation schedule for completing the treatment modifications.

43.7(3) Source water treatment requirements. Public water supply systems shall complete the applicable source water monitoring and treatment requirements, as described in the referenced portions of 43.7(3) "b," and in 567—paragraphs 41.4(1) "c" and "e," by the following deadlines.

a. Deadlines for completing source water treatment steps.

(1) Step 1. A public water supply system exceeding the lead or copper action level shall complete lead and copper source water monitoring under 567—subparagraph 41.4(1) "e"(2) and make a written treatment recommendation to the department no later than 180 days after the end of the monitoring period during which the lead or copper action level was exceeded.

(2) Step 2. The department will make a determination regarding source water treatment pursuant to 43.7(3) "b"(2) within six months after submission of monitoring results under Step 1.

(3) Step 3. If installation of source water treatment is required, the system shall install the treatment pursuant to 43.7(3) "b"(3) within 24 months after completion of Step 2.

(4) Step 4. The public water supply system shall complete follow-up tap water monitoring under 567—paragraph 41.4(1)“c”(4)“2” and source water monitoring under 567—subparagraph 41.4(1)“e”(3) within 36 months after completion of Step 2.

(5) Step 5. The department will review the system’s installation and operation of source water treatment and specify maximum permissible source water levels under 43.7(3)“b”(4) within six months after completion of Step 4.

(6) Step 6. The public water supply system shall operate in compliance with the specified maximum permissible lead and copper source water levels under 43.7(3)“b”(4) and continue source water monitoring pursuant to 567—subparagraph 41.4(1)“e”(4).

b. Description of source water treatment requirements.

(1) System treatment recommendation. Any system which exceeds the lead or copper action level shall recommend in writing to the department the installation and operation of one of the source water treatments listed in 43.7(3)“b”(2). A system may recommend that no treatment be installed based upon a demonstration that source water treatment is not necessary to minimize lead and copper levels at users’ taps.

(2) Source water treatment determinations. The department will complete an evaluation of the results of all source water samples submitted by the public water supply system to determine whether source water treatment is necessary to minimize lead or copper levels in water delivered to users’ taps. If the department determines that treatment is needed, the department will require installation and operation of the source water treatment recommended by the public water supply system or require the installation and operation of another source water treatment from among the following: ion exchange, reverse osmosis, lime softening or coagulation/filtration. If the department requests additional information to aid in its review, the water system shall provide the information by the date specified in its request. The department will notify the system in writing of its determination and set forth the basis for its decision.

(3) Installation of source water treatment. Public water supply systems shall properly install and operate the source water treatment designated by the department under 43.7(3)“b”(2).

(4) Department review of source water treatment and specification of maximum permissible source water levels. The department will review the source water samples taken by the water supply system both before and after the system installs source water treatment and determine whether the public water supply system has properly installed and operated the designated source water treatment. Based upon its review, the department will designate maximum permissible lead and copper concentrations for finished water entering the distribution system. Such levels shall reflect the contaminant removal capability of the treatment (properly operated and maintained). The department will notify the public water supply system in writing and explain the basis for its decision.

(5) Continued operation and maintenance. Each public water supply system shall maintain lead and copper levels below the maximum permissible concentrations designated by the department at each sampling point monitored in accordance with 567—paragraph 41.4(1)“e.” The system is out of compliance with this paragraph if the level of lead or copper at any sampling point is greater than the maximum permissible designated concentration.

(6) Modification of source water treatment decisions. The department may modify its determination of the source water treatment under 43.7(3)“b”(6), or maximum permissible lead and copper concentrations for finished water entering the distribution system under 43.7(3)“b”(4). A request for modification by a public water supply system or other interested party shall be in writing, explain why the modification is appropriate, and provide supporting documentation. The department may modify its determination where it concludes that such change is necessary to ensure that the system continues to minimize lead and copper concentrations in source water. A revised determination will be made in writing, set forth the new treatment requirements, explain the basis for the decision, and provide an implementation schedule for completing the treatment modifications.

43.7(4) Lead service line replacement requirements.

a. Applicability. Public water supply systems that fail to meet the lead action level in tap samples taken pursuant to 567—paragraph 41.4(1)“c”(4)“2” after installing corrosion control or source water

treatment (whichever sampling occurs later) shall replace lead service lines in accordance with the requirements of this subrule. If a system is in violation of 43.7(1) and 43.7(3) for failure to install source water or corrosion control treatment, the department may require the system to commence lead service line replacement under this subrule after the date by which the system was required to conduct monitoring under 567—paragraph 41.4(1)“c”(4)“2” has passed.

b. Lead service line replacement schedule. A public water supply system shall replace annually at least 7 percent of the initial number of lead service lines in its distribution system. The initial number of lead service lines is the number of lead lines in place at the time the replacement program begins. The system shall identify the initial number of lead service lines in its distribution system, including an identification of the portion(s) owned by the system, based upon a materials evaluation, including the evaluation required under 567—subparagraph 41.4(1)“c”(1), and relevant legal authorities regarding the portion owned by the system such as contracts and local ordinances.

(1) The first year of lead service line replacement shall begin on the first day following the end of the monitoring period in which the action level was exceeded in tap sampling referenced in 43.7(4)“a.” If monitoring is required annually or less frequently, the end of the monitoring period is September 30 of the calendar year in which the sampling occurs. If the department has established an alternate monitoring period, then the end of the monitoring period will be the last day of that period.

(2) Any water system resuming a lead service line replacement program after the cessation of its lead service line replacement program as allowed by 43.7(4)“g” shall update its inventory of lead service lines to include those sites that were previously determined not to require replacement through the sampling provision under 43.7(4)“c.” The system will then divide the updated number of remaining lead service lines by the number of remaining years in the program to determine the number of lines that must be replaced per year. Seven percent lead service line replacement is based on a 15-year replacement program. For example, systems resuming lead service line replacement after previously conducting two years of replacement would divide the updated inventory by 13.

(3) For those systems that have completed a 15-year lead service line replacement program, the department will determine a schedule for replacing or retesting lines that were previously exempted through testing under 43.7(4)“c” from the replacement program when the system re-exceeds the action level.

c. Exemption to lead service line replacement requirement. A public water supply system is not required to replace an individual lead service line if the lead concentration in all service line samples from that line, taken pursuant to 567—paragraph 41.4(1)“c”(2)“3,” is less than or equal to 0.015 mg/L.

d. Lead service line replacement requirements. A water system shall replace that portion of the lead service line that it owns. In cases where the system does not own the entire lead service line, the system shall notify the owner of the line, or the owner’s authorized agent, that the system will replace the portion of the service line that it owns and shall offer to replace the owner’s portion of the line. A system is not required to bear the cost of replacing the privately owned portion of the line, nor is it required to replace the privately owned portion of the line where the owner chooses not to pay the cost of replacing the privately owned portion of the line, or where replacing the privately owned portion would be precluded by state, local, or common law. A water system that does not replace the entire length of the service line shall complete the following tasks.

(1) Notification of residents. At least 45 days prior to commencing with the partial replacement of a lead service line, the water system shall provide to the resident(s) of all buildings served by the line notice explaining that the resident(s) may experience a temporary increase of lead levels in their drinking water, along with guidance on measures consumers may take to minimize their exposure to lead. The department may allow the water system to provide this notice less than 45 days prior to commencing partial lead service line replacement where such replacement is in conjunction with emergency repairs. In addition, the water system shall inform the resident(s) served by the line that the system will, at the system’s expense, collect from each partially replaced lead service line a sample that is representative of the water in the service line for analysis of lead content, as prescribed under 567—paragraph 41.4(1)“c”(2)“3,” within 72 hours after the completion of the partial replacement of the service line. The system shall collect the sample and report the results of the analysis to the owner

and the resident(s) served by the line within three business days of receiving the results. Mailed notices postmarked within three business days of receiving the results shall be considered “on time.”

(2) Notification methods. The water system shall provide the information required by subparagraph 43.7(4) “d”(1) to the residents of individual dwellings by mail or by other methods approved by the department. In instances where multifamily dwellings are served by the line, the water system shall have the option to post the information at a conspicuous location.

e. Lead service line control—department review. Rescinded IAB 1/7/04, effective 2/11/04.

f. Lead service line replacement schedule. The department may require a public water supply system to replace lead service lines on a shorter schedule than that required by this subrule, taking into account the number of lead service lines in the system, where such a shorter replacement schedule is feasible. The department will make this determination in writing and notify the system of its finding within six months after the system is triggered into lead service line replacement based on monitoring referenced in 43.7(4) “a.”

g. Cessation of lead service line replacement. Any public water supply system may cease replacing lead service lines whenever first draw samples collected pursuant to 567—paragraph 41.4(1) “c”(2) “2” meet the lead action level during each of two consecutive monitoring periods and the system submits the results. If the first draw tap samples collected in any such water system thereafter exceed the lead action level, the system shall recommence replacing lead service lines, as detailed in 43.7(4) “b.”

h. Lead service line replacement reporting requirements. To demonstrate compliance with 43.7(4) “a” through “d,” a system shall report the information specified in 567—paragraph 42.4(2) “e.” [ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.8(455B) Viability assessment.

43.8(1) Definitions specific to viability assessment.

“*New system*” for viability assessment purposes includes public water supply systems which are newly constructed after the effective date of this rule, as well as systems which do not currently meet the definition of a PWS, but which expand their infrastructure and thereby grow to become a PWS. Systems not currently meeting the definition of a PWS and which add additional users and thereby become a PWS without constructing any additional infrastructure are not “new systems” for the purposes of this subrule.

“*Nonviable system*” for viability assessment purposes means a system lacking the technical, financial, and managerial ability to comply with 567—Chapters 40 through 43 and 81.

“*Significant noncompliance (SNC)*” for viability assessment purposes means the failure to comply with any drinking water standard as adopted by the state of Iowa as designated by the department.

“*Viability*” for viability assessment purposes is the ability to remain in compliance insofar as the requirements of the federal Safe Drinking Water Act and 567—Chapters 40 through 43 and 81.

“*Viable system*” for viability assessment purposes means a system with the technical, financial, and managerial ability to comply with applicable drinking water standards adopted by the state of Iowa.

43.8(2) Applicability and purpose. These rules apply to all new and existing public water supplies, including the following: new systems commencing operation after October 1, 1999; systems deemed to be in significant noncompliance with the primary drinking water standards; DWSRF applicants; and existing systems. The purpose of the viability assessment program is to ensure the safety of the public drinking water supplies and ensure the viability of new public water supply systems upon commencement of operation. The department may assess public notification requirements and administrative penalties to any public water supply system which fails to fulfill the requirements of this rule.

43.8(3) Contents of a viability assessment. The viability assessment must address the areas of technical, financial, and managerial viability for a public water supply system. The assessment must include evaluation of the following areas at a minimum, and the public water supply system may be required to include additional information as directed by the department. The viability of a system should be forecast for a 20-year period.

a. Technical viability.

- (1) Supply sources and facilities

- (2) Treatment
- (3) Infrastructure (examples: pumping, storage, distribution)

b. Financial viability.

- (1) Capital and operating costs
- (2) Revenue sources
- (3) Contingency plans

c. Managerial viability.

- (1) Operation
- (2) Maintenance
- (3) Management
- (4) Administration

43.8(4) New systems.

a. Submission of system viability assessment. New public water supply systems (including community, nontransient noncommunity systems, and transient noncommunity systems) commencing operation after the effective date of this rule are required to submit a completed system viability assessment for review by the department, prior to obtaining a construction permit. The viability assessment may be submitted with the application for a construction permit. The department may reject receipt or delay review of the construction plans and specifications until an adequate viability assessment is provided. If the department finds, upon review and approval of the viability assessment, that the PWS will be viable, a construction permit will be issued in accordance with 567—Chapters 40 and 43. Prior to beginning operation, a public water supply operation permit must be obtained in accordance with 567—43.2(455B) and 567—40.5(455B).

b. Review of the viability assessment. If the department declines to approve the viability assessment as submitted by the applicant, or if the department finds that the PWS is not viable, approval of construction and operation permit applications will be denied. If the viability assessment is conditionally approved, construction and operation permits will be issued, with conditions and a schedule to achieve compliance specified in the operation permit.

43.8(5) Existing systems.

a. Submission of system viability assessment. Any community, nontransient noncommunity, or transient noncommunity water system which operated prior to October 1, 1999, and was regulated as a public water system by the department shall be considered an existing system. Any system which does not currently meet the definition of a PWS, but which expands their infrastructure and thereby grows to become a PWS is considered a new system. Systems not currently meeting the definition of a PWS and which add additional users and thereby become a PWS without constructing any additional infrastructure are considered existing systems for the purposes of this subrule. All PWSs should complete a viability assessment. However, only those existing PWSs which meet one or more of the following criteria are required to complete a viability assessment for the department's review and approval.

- (1) Systems applying for DWSRF loan funds.
- (2) Systems categorized as being in significant noncompliance by the department, due to their history of failure to comply with drinking water standards.
- (3) Systems identified by the department via a sanitary survey as having technical, managerial, or financial problems as evidenced by such conditions as poor operational control, a poor state of repair or maintenance, vulnerability to contamination, or inability to maintain adequate distribution system operating pressures.
- (4) Systems which have been unable to retain a certified operator in accordance with 567—Chapter 81.

b. Review of viability assessments for systems required to submit an assessment. If the assessment is incomplete and does not include all of the required elements, the supply will be notified in writing and will be given an opportunity to modify and resubmit the assessment within the time period specified by the department. If the system fails to resubmit a completed viability assessment as specified by the department, the department may find that the system is not viable. If the submitted assessment is

complete, the department will either indicate that the system is viable or not viable after the assessment review process. The system will be notified of the results of the evaluation by the department.

c. Review of voluntarily submitted viability assessments. It is recommended that all existing systems complete the viability assessment and submit it to the department. Voluntarily submitted assessments may be reviewed upon request and will be exempt from any requirements to modify the assessment if it is not approved, or from a determination that the system is not viable, providing the system does not meet any of the criteria for mandatory completion of a viability assessment as set forth in 43.8(4) “a” above.

43.8(6) Systems which are determined to be not viable.

a. Applicability. The following applies to community, nontransient noncommunity, and transient noncommunity systems:

(1) Systems applying for DWSRF loan funds must be viable, or the loan funds must be used to assist the system in attaining viable status. If a system making a loan application is found to be not viable, and loan funds will not be sufficient or available to ensure viability, then the situation must be corrected to the department’s satisfaction prior to qualification to apply for loan funds.

(2) Systems which meet the department’s criteria of significant noncompliance are not considered viable. The viability assessment completed by the public water supply and the most recent sanitary survey results will be evaluated by the department to assist the system in returning to and remaining in compliance, which would achieve viability. Required corrective actions will be specified in the system’s operation permit and will include a compliance schedule. Field office inspections will be conducted on an as-needed basis to assist the system in implementing the required system improvements.

(3) Systems experiencing technical, managerial, or financial problems as noted by department in the sanitary survey will be considered not viable. The viability assessment completed by the public water supply will be evaluated by the department to assist the system in attaining viability, and any required corrective actions will be specified in the system’s operation permit.

(4) Systems unable to retain a certified operator will be considered not viable. All community and nontransient noncommunity water systems, and transient noncommunity water systems as denoted by the department, are required to have a certified operator who meets the requirements of 567—Chapter 81. The viability assessment completed by the public water supply will be used to determine the source of the problem, and required corrective actions will be specified in the system’s operation permit.

b. Reserved.

43.8(7) Revocation or denial of operation or construction permit.

a. Revocation or denial of an operation permit. Failure to correct the deficiencies regarding viability, as identified in accordance with a compliance schedule set by the department, may result in revocation or denial of the system’s operation permit. If the department revokes or denies the operation permit, the owner of the system must negotiate an alternative arrangement with the department for providing treatment or water supply services within 30 days of receipt of the notification by the department unless the owner of the supply appeals the decision to the department. The public water supply is required to provide water that continually meets all health-based standards during the appeal process.

b. Denial of new construction permits for an existing system. In addition to the criteria provided in 567—Chapters 40 through 44, new construction permits for water system improvements may be denied until the system makes the required corrections and attains viable status unless the proposed project is necessary to attain viability.

c. Failure to conform to approved construction plans and specifications, or to comply with the requirements of 567—Chapters 40 to 44. Failure of a project to conform to approved construction plans and specifications, or failure to comply with the requirements of 567—Chapters 40 to 44, constitutes grounds for the director to withhold the applicable construction and operation permits. The system is then responsible for ensuring that the identified problem with the project is rectified so that permits may be issued. Once an agreement for correcting the problem is reached between the department and the system, the department will issue the appropriate permits according to the provisions of the agreement. If an agreement cannot be reached within a reasonable time period, the permit shall be denied.

d. Contents of the notification denying the permit. The notification of denial or withholding approval of the operation or construction permit will state the department's reasons for withholding or denying permit approval.

43.8(8) Appeals.

a. Request for formal review of determination of viability. A person or entity who disagrees with the decision regarding the viability of a public water supply system may request a formal review of the action. A request for review must be submitted in writing to the director by the owner or their designee within 30 days of the date of notification by the department of the viability decision.

b. Appeal of denial of operation or construction permit. A decision to deny an operation or construction permit may be appealed by the applicant to the environmental protection commission pursuant to 567—Chapter 7. The appeal must be made in writing to the director within 30 days of receiving the notice of denial by the owner of the public water supply.

567—43.9(455B) Enhanced filtration and disinfection requirements for surface water and IGW systems serving at least 10,000 people.

43.9(1) General requirements.

a. Applicability. The requirements of this rule constitute national primary drinking water regulations. This rule establishes the filtration and disinfection requirements that are in addition to criteria under which filtration and disinfection are required in 567—43.5(455B). The requirements of this rule are applicable, beginning January 1, 2002, to all public water systems using surface water or groundwater under the direct influence of surface water, in whole or in part, and which serve at least 10,000 people. This rule establishes or extends treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella*, *Cryptosporidium*, and turbidity. Each surface water or groundwater under the direct influence of surface water system serving at least 10,000 people must provide treatment of its source water that complies with these treatment technique requirements and they are in addition to those identified in subrule 43.5(1). The treatment technique requirements consist of installing and properly operating water treatment processes that reliably achieve:

(1) At least 99 percent (2-log) removal of *Cryptosporidium* between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems.

(2) Compliance with the profiling and benchmark requirements under 43.9(2).

(3) The department may require other surface water or groundwater under the direct influence of surface water systems to comply with this rule, through an operation permit.

b. Compliance determination. A public water system subject to the requirements of this rule is considered to be in compliance with the requirements of 43.9(1) "a" if it meets the applicable filtration requirements in either 43.5(3) or 43.9(3) and the disinfection requirements in 43.5(2) and 43.6(2).

c. Prohibition of new construction of uncovered intermediate or finished water storage facilities. Systems that are required to comply with this rule may construct only covered intermediate or finished water storage facilities. For the purposes of this rule, an intermediate storage facility is defined as a storage facility or reservoir after the clarification treatment process.

d. Systems with populations that increased after January 1, 2002, to more than 10,000 people served. Systems using surface water or influenced groundwater sources that did not conduct optional monitoring under 43.9(2) because they served fewer than 10,000 persons when such monitoring was required, but serve more than 10,000 persons prior to January 1, 2005, must comply with 43.9(1), 43.9(3), 43.9(4), and 43.9(5). These systems must also consult with the department to establish a disinfection benchmark. A system that decides to make a significant change to its disinfection practice as described in 43.9(2) "c" (1) "1" through "4" must consult with the department prior to making such a change.

43.9(2) Disinfection profiling and benchmarking.

a. Determination of systems required to profile. A public water system subject to the requirements of this rule must determine its total trihalomethane (TTHM) and haloacetic acid (HAA5) annual averages using the procedures listed below. The annual average is the arithmetic average of the quarterly averages

of four consecutive quarters of monitoring. Both the TTHM and HAA5 samples must be collected as paired samples during the same time period in order for each parameter to have the same annual average period for result comparison. A paired sample is one that is collected at the same location and time and is analyzed for both TTHM and HAA5 parameters.

(1) Allowance of information collection rule data. Those systems that collected data under the provisions of the federal Information Collection Rule listed in Code of Federal Regulations Title 40, Part 141, Subpart M, must use the results of the TTHM and HAA5 samples collected during the last four quarters of monitoring required under 40 CFR 141.142. The system must have submitted the results of the samples collected during the last 12 months of required monitoring.

(2) Systems that have not collected TTHM and HAA5 data under 43.9(2)“a”(1). Those systems that have not collected four consecutive quarters of paired TTHM and HAA5 samples as described under 43.9(2)“a”(1) must comply with all other provisions of this subrule as if the HAA5 monitoring had been conducted and the results of that monitoring required compliance with 43.9(2)“b.” The system that elects this option must notify the department in writing of its decision.

(3) The department may require that a system use a more representative annual data set than the data set determined under 567—subparagraph 42.9(2)“a”(1) for the purpose of determining applicability of the requirements of this subrule.

(4) Profiling determination criteria. Any system having either a TTHM annual average greater than 0.064 mg/L or an HAA5 annual average greater than 0.048 mg/L during the period identified in 43.9(2)“a”(1) through (3) must comply with 43.9(2)“b.”

b. Disinfection profiling.

(1) Applicability. Any system that meets the criteria in 43.9(2)“a”(4) must develop a disinfection profile of its disinfection practice for a period of up to three years.

(2) Monitoring requirements. The system must monitor daily for a period of 12 consecutive calendar months to determine the total logs of inactivation for each day of operation, based on the $CT_{99.9}$ values in Tables 1 through 8 in Appendix A, as appropriate, through the entire treatment plant. This system must begin this monitoring as directed by the department. As a minimum, the system with a single point of disinfectant application prior to entrance to the distribution system must conduct the monitoring in 43.9(2)“b”(2)“1” through “4.” A system with more than one point of disinfectant application must conduct the monitoring in 43.9(2)“b”(2)“1” through “4” for each disinfection segment. The system must monitor the parameters necessary to determine the total inactivation ratio, using analytical methods in 43.5(4)“a” as follows:

1. The temperature of the disinfected water must be measured once per day at each residual disinfectant concentration sampling point during peak hourly flow.

2. If the system uses chlorine, the pH of the disinfected water must be measured once per day at each chlorine residual disinfectant concentration sampling point during peak hourly flow.

3. The disinfectant contact time(s) (“T”) must be determined for each day during peak hourly flow.

4. The residual disinfectant concentration(s) (“C”) of the water before or at the first customer and prior to each additional point of disinfection must be measured each day during peak hourly flow.

(3) Use of existing data. A system that has existing operational data may use those data to develop a disinfection profile for additional years, in addition to the disinfection profile generated under 43.9(2)“b”(2). Such systems may use these additional yearly disinfection profiles to develop a benchmark under the provisions of 43.9(2)“c.” The department must determine whether these operational data are substantially equivalent to data collected under the provisions of 43.9(2)“b”(2). These data must also be representative of inactivation through the entire treatment plant and not just of certain treatment segments.

(4) Calculation of the total inactivation ratio. The system must calculate the total inactivation ratio as follows, using the $CT_{99.9}$ values from Tables 1 through 8 listed in Appendix A:

1. If the system uses only one point of disinfectant application, the system may determine the total inactivation ratio for the disinfection segment based on either of the following two methods:

- Determine one inactivation ratio ($CT_{calc}/CT_{99.9}$) before or at the first customer during peak hourly flow.

- Determine successive $CT_{calc}/CT_{99.9}$ values, representing sequential inactivation ratios, between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining $(CT_{calc}/CT_{99.9})$ for each sequence and then adding the $(CT_{calc}/CT_{99.9})$ values together to determine $\Sigma(CT_{calc}/CT_{99.9})$.

2. If the system uses more than one point of disinfectant application before the first customer, the system must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. The $CT_{calc}/CT_{99.9}$ value of each segment and $\Sigma(CT_{calc}/CT_{99.9})$ must be calculated using the method in 43.9(2) "b"(4)"1."

3. The system must determine the total logs of inactivation by multiplying the value calculated in 43.9(2) "b"(4)"1" or "2" by 3.0.

(5) Systems using chloramines or ozone. A system that uses either chloramines or ozone for primary disinfection must also calculate the logs of inactivation for viruses using a method approved by the department.

(6) Profile retention requirements. The system must retain disinfection profile data in graphic form, as a spreadsheet, or in some other format acceptable to the department for review as part of sanitary surveys conducted by the department. The department may require the system to submit the data to the department directly or as part of a monthly operation report.

c. Disinfection benchmarking.

(1) Significant change to disinfection practice. Any system required to develop a disinfection profile under the provisions of 43.9(2) "a" or "b" that decides to make a significant change to its disinfection practice must obtain department approval prior to making such change. Significant changes to disinfection practice are:

1. Changes to the point of disinfection;
2. Changes to the disinfectant(s) used in the treatment plant;
3. Changes to the disinfection process; and
4. Any other modification identified by the department.

(2) Calculation of the disinfection benchmark. Any system that is modifying its disinfection practice must calculate its disinfection benchmark using the procedure specified below:

1. For each year of profiling data collected and calculated under 43.9(2) "b," the system must determine the lowest average monthly *Giardia lamblia* inactivation in each year of profiling data. The system must determine the average *Giardia lamblia* inactivation for each calendar month for each year of profiling data by dividing the sum of daily *Giardia lamblia* inactivation by the number of values calculated for that month.

2. The disinfection benchmark is the lowest monthly average value (for systems with one year of profiling data) or average of lowest monthly average values (for systems with more than one year of profiling data) of the monthly logs of *Giardia lamblia* inactivation in each year of profiling data.

(3) A system that uses either chloramines or ozone for primary disinfection must also calculate the disinfection benchmark for viruses using a method approved by the department.

(4) The system must submit the following information to the department as part of its consultation process:

1. A description of the proposed change;
2. The disinfection profile for *Giardia lamblia* (and, if necessary, viruses) under 43.9(2) "b" and the disinfection benchmark as required by 43.9(2) "c"(2); and
3. An analysis of how the proposed change will affect the current levels of disinfection.

43.9(3) Filtration.

a. Conventional filtration treatment or direct filtration.

(1) Turbidity requirement in 95 percent of samples. For systems using conventional filtration or direct filtration, the turbidity level of representative samples of a system's filtered water (combined filter effluent or CFE) must be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month, measured as specified in 43.5(4) "a"(1) and 43.5(4) "b"(1).

(2) Maximum turbidity level. The turbidity level of representative samples of a system's filtered water (combined filter effluent or CFE) must at no time exceed 1 NTU, measured as specified in 43.5(4)"a"(1) and 43.5(4)"b"(1). If at any time the combined filter effluent turbidity exceeds 1 NTU, either in a grab sample used for compliance or in a continuously monitored flow, the system must inform the department as soon as possible, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3)"b"(3).

(3) Systems with lime-softening treatment. A system that uses lime softening may acidify representative samples prior to analysis using a protocol approved by the department.

b. Filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration. The department may allow a public water system to use a filtration technology not listed in 43.9(3)"a" or 43.5(3)"c" or "d" if it demonstrates to the department, using pilot plant studies or other means, that the alternative filtration technology, in combination with disinfection treatment that meets the requirements of 43.5(2), consistently achieves 99.9 percent removal or inactivation of *Giardia lamblia* cysts, 99.99 percent removal or inactivation of viruses, and 99 percent removal of *Cryptosporidium* oocysts and the department approves the use of the filtration technology. For each approval, the department will set turbidity performance requirements that the system must meet at least 95 percent of the time and the requirement that the system shall not exceed at any time at a level that consistently achieves 99.9 percent removal or inactivation of *Giardia lamblia* cysts, 99.99 percent removal or inactivation of viruses, and 99 percent removal of *Cryptosporidium* oocysts.

43.9(4) Filtration sampling requirements.

a. Monitoring requirements for systems using filtration treatment. In addition to monitoring required by 43.5(4), a public water system subject to the requirements of this rule that provides conventional filtration treatment or direct filtration must conduct continuous monitoring of turbidity for each individual filter using an approved method in 43.5(4)"a"(1) and must calibrate turbidimeters at least every 90 days with a primary standard. The calibration of each turbidimeter used for compliance must be verified at least once per week with a primary standard, secondary standards, or the manufacturer's proprietary calibration confirmation device or by a method approved by the department. If the verification is not within plus or minus 0.05 NTU for measurements of less than or equal to 0.5 NTU, or within plus or minus 10 percent of measurements greater than 0.5 NTU, then the turbidimeter must be recalibrated. Systems must record the results of individual filter monitoring every 15 minutes.

b. Failure of the continuous turbidity monitoring equipment. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is repaired and back online. A system has a maximum of five working days after failure to repair the equipment, or else it is in violation.

43.9(5) Reporting and record-keeping requirements. In addition to the reporting and record-keeping requirements in 567—paragraph 42.4(3)"c," a system subject to the requirements of this rule that provides conventional filtration treatment or direct filtration must report monthly to the department the information specified in 43.9(5)"a" and "b" beginning January 1, 2002. In addition to the reporting and record-keeping requirements in 567—paragraph 42.4(3)"c," a system subject to the requirements of this rule that provides filtration approved under 43.9(3)"b" must report monthly to the department the information specified in 43.9(5)"a" beginning January 1, 2002. The reporting in 43.9(5)"a" is in lieu of the reporting specified in 567—subparagraph 42.4(3)"c"(1).

a. Turbidity. Turbidity measurements as required by 43.9(3) must be reported in a format acceptable to the department and within ten days after the end of each month that the system serves water to the public. Information that must be reported includes:

(1) The total number of filtered water (combined filter effluent or CFE) turbidity measurements taken during the month;

(2) The number and percentage of filtered water (combined filter effluent or CFE) turbidity measurements taken during the month which are less than or equal to the turbidity limits specified in 43.9(3)"a" or "b"; and

(3) The date and value of any combined filter effluent or CFE turbidity measurements taken during the month which exceed 1 NTU for systems using conventional filtration treatment or direct filtration or which exceed the maximum level set by the department under 43.9(3) “b.”

(4) The dates and summary of calibration and verification of all compliance turbidimeters.

b. Individual filter turbidity monitoring. Systems must maintain the results of individual filter turbidity per monitoring taken under 43.9(4) for at least three years. Systems must report to the department that they have conducted individual filter turbidity monitoring under 43.9(4) within ten days after the end of each month that the system serves water to the public. Systems must report to the department individual filter turbidity measurement results taken under 43.9(4) within ten days after the end of each month that the system serves water to the public only if measurements demonstrate one or more of the conditions specified in 43.9(5) “b”(1) through (4). Systems that use lime softening may apply to the department for alternative exceedance levels for the levels specified in 43.9(5) “b”(1) through (4) if they can demonstrate that higher turbidity levels in individual filters are due to lime carryover only and not due to degraded filter performance.

(1) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(2) For any individual filter that has a measured turbidity level of greater than 0.5 NTU in two consecutive measurements taken 15 minutes apart anytime following the first four hours of continuous filter operation after the filter has been backwashed or otherwise taken offline, the system must report the filter number, the turbidity, and the date(s) on which the exceedance occurred. In addition, the system must either produce a filter profile for the filter within seven days of the exceedance (if the system is not able to identify an obvious reason for the abnormal filter performance) and report that the profile has been produced or report the obvious reason for the exceedance.

(3) For any individual filter that has a measured turbidity level of greater than 1.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each month of three consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must conduct a self-assessment of the filter within 14 days of the exceedance and report that the self-assessment was conducted. The self-assessment must consist of at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a filter self-assessment report.

(4) For any individual filter that has a measured turbidity level of greater than 2.0 NTU in two consecutive measurements taken 15 minutes apart at any time in each month of two consecutive months, the system must report the filter number, the turbidity measurement, and the date(s) on which the exceedance occurred. In addition, the system must arrange for a comprehensive performance evaluation to be conducted by the department or a third party approved by the department no later than 30 days following the exceedance and have the evaluation completed and submitted to the department no later than 90 days following the exceedance.

c. Additional reporting requirement for turbidity combined filter effluent.

(1) If at any time the turbidity exceeds 1 NTU in representative samples of filtered water (combined filter effluent or CFE) in a system using conventional filtration treatment or direct filtration, the system must consult with the department as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3) “b”(3).

(2) If at any time the turbidity in representative samples of filtered water (combined filter effluent or CFE) exceeds the maximum level set by the department under 43.9(3) “b” for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must consult with the department as soon as practical, but no later than 24

hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3) “b”(3).

[ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.10(455B) Enhanced filtration and disinfection requirements for surface water and IGW systems serving fewer than 10,000 people.

43.10(1) General requirements.

a. Applicability. The requirements of this rule constitute national primary drinking water regulations. This rule establishes requirements for filtration and disinfection that are in addition to criteria under which filtration and disinfection are required in 567—43.5(455B). The requirements of this rule are applicable beginning January 1, 2005, unless otherwise noted, to all public water systems using surface water or groundwater under the direct influence of surface water, in whole or in part, and which serve less than 10,000 people. This rule establishes or extends treatment technique requirements in lieu of maximum contaminant levels for the following contaminants: *Giardia lamblia*, viruses, heterotrophic plate count bacteria, *Legionella*, *Cryptosporidium*, and turbidity. The treatment technique requirements consist of installing and properly operating water treatment processes which reliably achieve:

(1) At least 99 percent (2 log) removal of *Cryptosporidium* between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer for filtered systems; and

(2) Compliance with the profiling and benchmark requirements in subrules 43.10(2) and 43.10(3).

b. Prohibition of new construction of uncovered intermediate or finished water storage facilities. Systems that are required to comply with this rule may construct only covered intermediate or finished water storage facilities. For the purposes of this rule, an intermediate storage facility is defined as a storage facility or reservoir after the clarification treatment process.

43.10(2) Disinfection profile.

a. Applicability. A disinfection profile is a graphical representation of a system’s level of *Giardia lamblia* or virus inactivation measured during the course of a year. All systems required to comply with this rule must develop a disinfection profile unless the department determines that such a profile is unnecessary. Records must be maintained according to subrule 43.10(7).

(1) The department may approve the use of a more representative data set for disinfection profiling than the data set required in paragraph 43.10(2) “b.”

(2) The department may determine that a system’s profile is unnecessary only if a system’s TTHM and HAA5 levels are below 0.064 mg/L and 0.048 mg/L, respectively. To determine these levels, TTHM and HAA5 samples must be collected after January 1, 1998, during the month with the warmest water temperature, and at the point of maximum residence time in the distribution system. The department may approve the use of a more representative annual data set for purpose of determining applicability of the requirements of this subrule. The annual data set must be calculated on an annual average, of the arithmetic average of the quarterly averages of four consecutive quarters of monitoring. At least 25 percent of the samples collected in each quarter must be collected at the maximum residence time location in the distribution system.

1. For systems that provide water to other public water supplies, if the producing system meets the byproduct level requirements of less than 0.064 mg/L for TTHM and less than 0.048 mg/L for HAA5, it will not be required to develop a disinfection profile and benchmark unless:

- The consecutive system cannot meet in its distribution system the byproduct level requirements of less than 0.064 mg/L for TTHM and less than 0.048 mg/L for HAA5, and
- The producing system wants to make a significant change to its disinfection practices.

2. The department will then assign the requirement to the producing system to conduct the disinfection profiling study and determine a disinfection benchmark.

b. Required elements of a disinfection profile.

(1) Collection of the following data for 12 consecutive months, beginning by July 1, 2003, for systems serving 500 to 9,999 people, and by January 1, 2004, for systems serving fewer than 500

people. A system must monitor the following parameters to determine the total log inactivation by using the analytical methods in paragraph 43.5(4) "a," once per week on the same calendar day, over 12 consecutive months.

1. Temperature of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow, measured in degrees Celsius;
2. For systems using chlorine, the pH of the disinfected water at each residual disinfectant concentration sampling point during peak hourly flow, measured in standard pH units;
3. The disinfectant contact time ("T") during peak hourly flow, measured in minutes; and
4. The residual disinfectant concentration(s) ("C") of the water following each point of disinfection at a point(s) prior to each subsequent point of disinfection and at the entry point to the distribution system or at a location just prior to the first customer during peak hourly flows, measured in mg/L.

(2) The data collected in 43.10(2) "b"(1) must be used to calculate the weekly log inactivation, along with the CT_{99,9} tables listed in Appendix A. The system must calculate the total inactivation ratio as follows and multiply the value by 3.0 to determine log inactivation of *Giardia lamblia*:

1. If the system uses only one point of disinfectant application, it must determine:
 - One inactivation ratio (CT calc/CT_{99,9}) before or at the first customer during peak hourly flow, or
 - Successive (CT calc/CT_{99,9}) values, representing sequential inactivation ratios, between the point of disinfection application and a point before or at the first customer during peak hourly flow. Under this alternative, the system must calculate the total inactivation ratio by determining (CT calc/CT_{99,9}) for each sequence and then adding the (CT calc/CT_{99,9}) values together to determine (ΣCT calc/CT_{99,9}).
2. If a system uses more than one point of disinfectant application before the first customer, the system must determine the (CT calc/CT_{99,9}) value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow using the procedure specified in 43.10(2) "b"(2) "1," second bulleted paragraph.
3. If a system uses chloramines, ozone, or chlorine dioxide for primary disinfection, the system must also calculate the inactivation logs for viruses and develop an additional disinfection profile for viruses using methods approved by the department.

(3) The weekly log inactivations are used to develop a disinfection profile, as follows:

1. The disinfection profile is developed by graphing each log inactivation data point versus time. Each log inactivation serves as a data point in the disinfection profile. The system will have obtained 52 measurements at a minimum, one for each week of the year.
2. The disinfection profile depicts the variation of microbial inactivation over the course of the year.
3. The system must retain the disinfection profile data both in a graphic form and in a spreadsheet, which must be available for review by the department.
4. This profile is used to calculate a disinfection benchmark if the system is considering changes to its disinfection practices.

43.10(3) Disinfection benchmark.

a. Applicability. Any system required to develop a disinfection profile under 43.10(2) must develop a disinfection benchmark prior to making any significant change in disinfection practice. The system must receive department approval before any significant change in disinfection practice is implemented. Records must be maintained according to subrule 43.10(7).

b. Significant changes to disinfection practice. Significant changes to disinfection practice include:

- (1) Changes to the point of disinfection;
- (2) Changes to the disinfectant(s) used in the treatment plant;
- (3) Changes to the disinfection process; or
- (4) Any other modification identified by the department.

c. Calculation of the disinfection benchmark. The system must calculate the disinfection benchmark in the following manner:

(1) Step 1. Using the data collected to develop the disinfection profile, the system must determine the average *Giardia lamblia* inactivation for each calendar month by dividing the sum of all *Giardia lamblia* inactivations for that month by the number of values calculated for that month.

(2) Step 2. The system must determine the lowest monthly average value out of the 12 values. This value becomes the disinfection benchmark.

d. Information required for department approval of a change in disinfection practice. Any significant change in disinfection practice must have been approved by the department before the system institutes the change. The following information must be submitted by the system to the department as part of the consultation and approval process.

- (1) A description of the proposed change;
- (2) The disinfection profile for *Giardia lamblia* and, if necessary, viruses;
- (3) The disinfection benchmark;
- (4) An analysis of how the proposed change will affect the current levels of disinfection; and
- (5) Any additional information requested by the department.

e. Additional benchmark requirements if chloramines, ozone, or chlorine dioxide is used for primary disinfection. If a system uses chloramines, ozone, or chlorine dioxide for primary disinfection, the system must calculate the disinfection benchmark from the data collected for viruses to develop the disinfection profile in addition to the *Giardia lamblia* disinfection benchmark calculated in paragraph 43.10(3)“c.” This viral benchmark must be calculated in the same manner used to calculate the *Giardia lamblia* disinfection benchmark in paragraph 43.10(3)“c.”

43.10(4) Combined filter effluent turbidity requirements. All systems using surface water or groundwater under the direct influence of surface water which serve less than 10,000 people must use filtration, and the turbidity limits that must be met depend upon the type of filtration used. Systems using lime softening may acidify representative combined filter effluent turbidity samples prior to analysis, using a protocol approved by the department.

a. Conventional filtration treatment or direct filtration.

(1) Turbidity must be measured in the combined filter effluent as described in paragraphs 43.5(4)“a” and “b.”

(2) The turbidity in the combined filter effluent must be less than or equal to 0.3 NTU in 95 percent of the turbidity measurements taken each month.

(3) The turbidity in the combined filter effluent must never exceed 1 NTU at any time during the month. If at any time the combined filter effluent turbidity exceeds 1 NTU, either in a grab sample used for compliance or in a continuously monitored flow, the system must inform the department as soon as possible, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraphs 42.1(3)“b”(3) and 42.1(2)“a”(8).

(4) The monthly reporting requirements are listed in subrule 43.10(6).

b. Slow sand filtration or diatomaceous earth filtration.

(1) Turbidity must be measured in the combined filter effluent as described in paragraphs 43.5(4)“a” and “b.”

(2) The combined filter effluent turbidity limits of subrule 43.5(3) must be met.

(3) The monthly reporting requirements are listed in subrule 43.10(6).

c. Other alternative filtration technologies. By using pilot studies or other means, a system using alternative filtration must demonstrate to the satisfaction of the department that the system’s filtration, in combination with disinfection treatment, consistently achieves 99 percent removal of *Cryptosporidium* oocysts; 99.9 percent removal, inactivation, or a combination of both, of *Giardia lamblia* cysts; and 99.99 percent removal, inactivation, or a combination of both, of viruses. The department will then use the pilot study data to determine system-specific turbidity limits.

(1) Turbidity must be measured in the combined filter effluent as described in paragraphs 43.5(4)“a” and “b.”

(2) The turbidity must be less than or equal to a value set by the department in 95 percent of the combined filter effluent turbidity measurements taken each month, based on the pilot study. The value may not exceed 1 NTU.

(3) The combined filter effluent turbidity must never exceed a value set by the department, based on the pilot study. The value may not exceed 5 NTU.

(4) The monthly reporting requirements are listed in subrule 43.10(6).

43.10(5) Individual filter turbidity requirements. All systems utilizing conventional filtration or direct filtration must conduct continuous monitoring of turbidity for each individual filter. Records must be maintained according to subrule 43.10(7).

a. Continuous turbidity monitoring requirements. Following are the continuous turbidity monitoring requirements.

(1) Monitoring must be conducted using an approved method listed in paragraph 43.5(4)“a”;

(2) Calibration of turbidimeters must be conducted at least every 90 days with a primary standard. The calibration of each turbidimeter used for compliance must be verified at least once per week with a primary standard, secondary standards, or the manufacturer’s proprietary calibration confirmation device or by a method approved by the department. If the verification is not within plus or minus 0.05 NTU for measurements of less than or equal to 0.5 NTU, or within plus or minus 10 percent of measurements greater than 0.5 NTU, the turbidimeter must be recalibrated;

(3) Results of turbidity monitoring must be recorded at least every 15 minutes;

(4) Monthly reporting must be completed according to subrule 43.10(6); and

(5) Records must be maintained according to 43.10(7).

b. Failure of continuous turbidity monitoring equipment. If there is a failure in the continuous turbidity monitoring equipment, the system must conduct grab sampling every four hours in lieu of continuous monitoring until the turbidimeter is back on-line. A system has a maximum of 14 days after failure to repair the equipment, or else the system is in violation. The system must notify the department within 24 hours of both when the turbidimeter was taken off-line and when it was returned on-line.

c. Special provision for one-filter or two-filter systems. If a system has only one or two filters, it may conduct continuous monitoring of the combined filter effluent turbidity instead of individual effluent turbidity monitoring. The continuous monitoring of the combined filter effluent turbidity must meet the requirements listed in 43.10(5)“a” and “b.”

d. Alternative turbidity levels for systems using lime softening. Systems using lime softening may apply to the department for alternative turbidity exceedance levels for the levels specified in 43.10(5)“e.” The system must be able to demonstrate to the satisfaction of the department that higher turbidity levels are due to lime carryover only, and not due to degraded filter performance.

e. Requirements triggered by the individual filter turbidity monitoring data. Systems are required to conduct additional activities based upon their individual filter turbidity monitoring data, as listed in this paragraph.

(1) If the turbidity of an individual filter (or the turbidity of the combined filter effluent for a system with one or two filters, pursuant to 43.10(5)“c”) exceeds 1.0 NTU in two consecutive recordings taken 15 minutes apart, the system must report the following information in the monthly operation report to the department by the tenth day of the following month:

1. The filter number(s);
2. Corresponding date(s);
3. Turbidity value(s) which exceeded 1.0 NTU; and
4. The cause of the exceedance(s), if known.

(2) If the turbidity of an individual filter (or the turbidity of the combined filter effluent for a system with one or two filters, pursuant to 43.10(5)“c”) exceeds 1.0 NTU in two consecutive recordings 15 minutes apart in three consecutive months, the system must meet the following requirements:

1. The system must conduct a self-assessment of the filter(s) within 14 days of the day the filter exceeded 1.0 NTU in two consecutive measurements for the third straight month, unless a comprehensive performance evaluation as specified in the following paragraph is required. Two-filter systems that monitor the combined filter effluent turbidity instead of the individual filters must conduct a self-assessment of both filters.

2. The self-assessment must consist of at least the following components:
 - Assessment of filter performance;

- Development of a filter profile;
- Identification and prioritization of factors limiting filter performance;
- Assessment of the applicability of corrections;
- Preparation of a filter self-assessment report;
- Date the self-assessment requirement was triggered; and
- Date the self-assessment was completed.

(3) If the turbidity of an individual filter (or the turbidity of the combined filter effluent for a system with one or two filters, pursuant to 43.10(5)“c”) exceeds 2.0 NTU in two consecutive recordings 15 minutes apart in two consecutive months, the system must meet the following requirements:

1. The system must arrange to have a comprehensive performance evaluation (CPE) conducted by the department or a third party approved by the department no later than 60 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month. The CPE report must be completed and submitted to the department within 120 days following the day the filter exceeded 2.0 NTU in two consecutive measurements for the second straight month.

2. A new CPE is not required if a CPE has been completed by the department or a third party approved by the department within the prior 12 months or if the system and department are jointly participating in an ongoing comprehensive technical assistance project at the system.

(4) The department may conduct a CPE at a system regardless of individual filter turbidity levels.

43.10(6) Reporting requirements. The system must meet the following reporting requirements:

a. Combined filter effluent turbidity monitoring.

(1) The following information must be reported in the monthly operation report to the department by the tenth day of the following month.

1. Total number of filtered water turbidity measurements taken during the month.

2. The number and percentage of filtered water turbidity measurements taken during the month which are less than or equal to the system’s required 95th percentile limit.

3. The date and analytical result of any turbidity measurements taken during the month which exceeded the maximum turbidity limit for the system, in addition to the requirements of (2).

4. The dates and summary of calibration and verification of all compliance turbidimeters.

(2) For an exceedance of the combined filter effluent maximum turbidity limit, the following requirements must be met.

1. If at any time the turbidity exceeds 1 NTU in representative samples of filtered water in a system using conventional filtration treatment or direct filtration, the system must consult with the department as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3)“b”(3).

2. If at any time the turbidity in representative samples of filtered water exceeds the maximum level under subrule 43.5(3) for slow sand filtration or diatomaceous earth filtration, the system must consult with the department as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3)“b”(3).

3. If at any time the turbidity in representative samples of filtered water exceeds the maximum level set by the department under paragraph 43.10(4)“c” for filtration technologies other than conventional filtration treatment, direct filtration, slow sand filtration, or diatomaceous earth filtration, the system must consult with the department as soon as practical, but no later than 24 hours after the exceedance is known, in accordance with the public notification requirements under 567—subparagraph 42.1(3)“b”(3).

b. Individual filter effluent turbidity monitoring. The following information must be reported in the monthly operation report to the department by the tenth day of the following month, unless otherwise noted.

(1) That the system conducted individual filter turbidity monitoring during the month.

(2) For any filter that had two consecutive measurements taken 15 minutes apart that exceeded 1.0 NTU, the following information must be reported:

1. The filter number(s);

2. The corresponding dates;

3. The turbidity values that exceeded 1.0 NTU; and
 4. The cause, if known, of the exceedance.
- (3) If a self-assessment was required, the date it was triggered and the date the assessment was completed must be reported. If the self-assessment requirement was triggered in the last four days of the month, the information must be reported to the department by the 14th day of the following month.
- (4) If a comprehensive performance evaluation was required, the date it was triggered must be reported. A copy of the CPE report must be submitted to the department within 120 days of when the CPE requirement was triggered.
- (5) The dates and summary of calibration and verification of all compliance turbidimeters.
- c. Disinfection profiling.* The following information must be reported to the department by January 1, 2004, for systems serving fewer than 500 people.
- (1) Results of disinfection byproduct monitoring that indicate TTHM levels less than 0.064 mg/L and HAA5 levels less than 0.048 mg/L; or
 - (2) That the system has begun to collect the profiling data.
- d. Disinfection benchmarking.* Before a system that was required to develop a disinfection profile makes a significant change to its disinfection practice, it must report the following information to the department, and the system must receive department approval before any significant change in disinfection practice is implemented.
- (1) Description of the proposed change in disinfection practice;
 - (2) The system's disinfection profile for *Giardia lamblia* and, if applicable, for viruses;
 - (3) The system's disinfection benchmark; and
 - (4) An analysis of how the proposed change will affect the current levels of disinfection.

43.10(7) Record-keeping requirements. The system must meet the following record-keeping requirements, in addition to the record-keeping requirements in 567—paragraph 42.4(3)“c” and 567—42.5(455B).

- a. Individual filter effluent turbidity requirements.* The results of the individual filter effluent turbidity monitoring must be kept for at least three years.
- b. Disinfection profiling requirements.* The results of the disinfection profile, including raw data and analysis, must be kept indefinitely.
- c. Disinfection benchmarking requirements.* The results of the disinfection benchmark, including raw data and analysis, must be kept indefinitely.

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567—43.11(455B) Enhanced treatment for *Cryptosporidium*.

43.11(1) Applicability. The requirements of this rule are national primary drinking water regulations and establish or extend treatment technique requirements in lieu of maximum contaminant levels for *Cryptosporidium*. These requirements are in addition to the filtration and disinfection requirements of 567—43.5(455B), 567—43.9(455B) and 567—43.10(455B) and apply to all Iowa public water systems supplied by surface water or influenced groundwater sources.

- a. Wholesale systems.* Wholesale systems must comply with the requirements based on the population of the largest system in the combined distribution system.
- b. Filtered systems.* The requirements of this rule for filtered systems apply to systems that are required to provide filtration treatment pursuant to 567—43.5(455B), whether or not the system is currently operating a filtration system.

43.11(2) General requirements. Systems subject to this rule must comply with the following requirements:

- a. Source water monitoring.* Systems must conduct two rounds of source water monitoring for each plant that treats a surface water or influenced groundwater source. This monitoring may include sampling for *Cryptosporidium*, *E. coli*, and turbidity, as described in 43.11(3), to determine what level, if any, of additional *Cryptosporidium* treatment the systems must provide.

b. Disinfection profiles and benchmarks. Systems that plan to make a significant change to their disinfection practice must develop disinfection profiles and calculate disinfection benchmarks, as described in 43.11(4).

c. Cryptosporidium treatment bin determination. Systems must determine their *Cryptosporidium* treatment bin classification and provide additional treatment for *Cryptosporidium*, if required, according to the prescribed schedule.

d. Additional treatment for Cryptosporidium. Systems required to provide additional treatment for *Cryptosporidium* must implement microbial toolbox options that are designed and operated as described in 43.11(8) through 43.11(13).

e. Record keeping and reporting. Systems must comply with the applicable record-keeping and reporting requirements described in 43.11(14) and 43.11(15).

f. Significant deficiencies. Systems must address significant deficiencies identified during sanitary surveys as described in 43.1(7).

43.11(3) Source water monitoring.

a. Schedule. Systems must conduct the source water monitoring no later than the month and year listed in Table 1. A system may avoid the source water monitoring if the system provides a total of at least 5.5-log treatment for *Cryptosporidium*, equivalent to meeting the treatment requirements of Bin 4 in 43.11(6). The system must install and operate technologies to provide this level of treatment by the applicable treatment compliance date specified in 43.11(7).

Table 1: Source Water Monitoring Schedule

| System | First round of monitoring | Second round of monitoring |
|--|---------------------------|----------------------------|
| Serves at least 100,000 people | October 2006 | April 2015 |
| Serves 50,000-99,999 people | April 2007 | October 2015 |
| Serves 10,000-49,999 people | April 2008 | October 2016 |
| Serves fewer than 10,000 people and only conducts <i>E. coli</i> monitoring | October 2008 | October 2017 |
| Serves fewer than 10,000 people and conducts <i>Cryptosporidium</i> monitoring | April 2010 | April 2019 |

b. Monitoring requirements. The minimum monitoring requirements are listed below. Systems may sample more frequently, provided the sampling frequency is evenly spaced throughout the monitoring period.

(1) Systems serving at least 10,000 people. Systems serving at least 10,000 people must sample their source water for *Cryptosporidium*, *E. coli*, and turbidity at least monthly for 24 months.

(2) Systems serving fewer than 10,000 people. Systems serving fewer than 10,000 people are allowed to first conduct *E. coli* monitoring to determine if further monitoring for *Cryptosporidium* is required.

1. Systems must sample their source water for *E. coli* at least once every two weeks for 12 months. If the annual mean *E. coli* concentration is at or below 100 *E. coli* per 100 mL, the system can avoid further *Cryptosporidium* monitoring in that sampling round.

2. A system may avoid *E. coli* monitoring if the system notifies the department no later than three months prior to the *E. coli* monitoring start date that the system will conduct *Cryptosporidium* monitoring.

3. Systems that fail to conduct the required *E. coli* monitoring or that cannot meet the *E. coli* annual mean limit are required to conduct *Cryptosporidium* monitoring. The system must sample its source water for *Cryptosporidium* either at least twice per month for 12 months or at least monthly for 24 months.

4. A system that begins monitoring for *E. coli* and determines during the sampling period that the system mathematically cannot meet the applicable *E. coli* annual mean limit may discontinue the *E. coli*

sampling. The system is then required to start *Cryptosporidium* monitoring according to the schedule in Table 1.

(3) Plants operating only part of the year. Systems with surface water or influenced groundwater treatment plants that operate for only part of the year must conduct source water monitoring in accordance with this rule, but with the following modifications.

1. Systems must sample their source water only during the months that the plant operates unless the department specifies another monitoring period based on plant operating practices.

2. Systems with plants that operate less than six months per year and that monitor for must collect at least six samples per year for two years. The samples must be evenly spaced throughout the period the plant operates.

(4) New sources. A system that begins using a new surface water or influenced groundwater source after the dates in Table 1 must monitor according to a schedule approved by the department and meet the requirements of this subrule. The system must also meet the requirements of the bin classification and *Cryptosporidium* treatment for the new source on a schedule approved by the department. The system must conduct the second round of source water monitoring no later than six years following the initial bin classification or determination of the mean *Cryptosporidium* level, as applicable.

(5) Monitoring violation determination. Failure to collect any source water sample required under this subrule in accordance with the sampling plan, location, analytical method, approved laboratory, or reporting requirements of 43.11(3)“c” through 43.11(3)“e” is a monitoring violation.

(6) Grandfathered monitoring data. Systems were allowed to use source water monitoring *Cryptosporidium* data collected prior to the applicable start date in Table 1 to meet the requirements of the first round of monitoring, a process referred to as grandfathering data. This grandfathered data substituted for an equivalent number of months at the end of the monitoring period and had to meet the requirements of 40 CFR 141.707 as adopted on January 5, 2006, which the department hereby adopts by reference. Department approval of the grandfathered data application is required.

c. Sampling plan. Systems must submit a sampling plan that specifies the sampling locations in relation to the sources and treatment processes and the calendar dates when the system will collect each required sample. The specific treatment process locations that must be included in the plan are pretreatment, points of chemical treatment, and filter backwash recycle.

(1) The sampling plan must be submitted no later than three months prior to the applicable monitoring date in Table 1. If the department does not respond to a system regarding the submitted sampling plan prior to the start of the monitoring period, the system must sample according to the submitted sampling plan.

(2) The plan must be submitted in a form acceptable to the department.

(3) The system must monitor within two days of the date specified in the plan, unless one of the following conditions occurs.

1. If an extreme condition or situation exists that may pose danger to the sample collector, or that cannot be avoided, and causes the system to be unable to sample in the scheduled five-day period, the system must sample as close to the scheduled date as is feasible unless the department approves an alternative sampling date. The system must submit an explanation for the delayed sampling date to the department within one week of the missed sampling period. A replacement sample must be collected.

2. If a system is unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method or quality control requirements, or failure of the laboratory to analyze the sample, the system must notify the department of the cause of the delay and collect a replacement sample.

3. A replacement sample must be collected within 21 days of the scheduled sampling period or on the resampling date approved by the department.

(4) Missed sampling dates. Systems that fail to meet the dates in their sampling plan for any source water sample must revise their sampling plan to add dates for collecting all missed samples. The revised schedule must be submitted to the department for approval prior to the collection of the missed samples.

d. Sampling locations. Systems must collect samples for each treatment plant that treats a surface water or influenced groundwater source. If multiple plants draw water from the same influent (same pipe

or intake), the department may approve one set of monitoring results to be used to satisfy the requirements for those plants.

(1) Chemical treatment location. Systems must collect source water samples prior to chemical treatment. If the system cannot feasibly collect a sample prior to chemical treatment, the department may grant approval for the system to collect the sample after chemical treatment. This approval would only be granted if the department determines in writing that collecting the samples prior to chemical treatment is not feasible for the system and that the chemical treatment is unlikely to have a significant adverse effect on the analysis of the sample.

(2) Filter backwash recycle return location. Systems that recycle filter backwash water must collect the source water samples prior to the point of filter backwash water addition.

(3) Bank filtration credit sampling location.

1. Systems that receive *Cryptosporidium* treatment credit for bank filtration under 43.9(3) "b" or 43.10(4) "c" must collect source water samples in the surface water source prior to bank filtration.

2. Systems that use bank filtration as pretreatment to a filtration plant must collect source water samples from the well, which is after bank filtration has occurred. Use of bank filtration during monitoring must be consistent with routine operational practice. Systems collecting samples after a bank filtration process may not receive treatment credit for the bank filtration under 43.11(10) "c."

(4) Multiple sources. Systems with plants that use multiple water sources, including multiple surface water sources and blended surface water and groundwater sources, must collect samples as follows:

1. The use of multiple sources during monitoring must be consistent with routine operational practice.

2. If a sampling tap is available where the sources are combined prior to treatment, the system must collect samples from that tap.

3. If a sampling tap where the sources are combined prior to treatment is not available, the system must collect samples at each source near the intake on the same day and must use either of the following options for sample analysis.

- Physically composite the source samples into a single sample for analysis. Systems may composite the sample from each source into one sample prior to analysis. The volume of the sample from each source must be weighted according to the proportion of the source in the total plant flow at the time the sample is collected.

- Analyze the samples separately and mathematically composite the results. Systems may analyze samples from each source separately and calculate a weighted average of the analytical results for each sampling date. The weighted average must be calculated by multiplying the analytical result for each source by the fraction that source contributed to the total plant flow at the time the sample was collected and then summing the weighted analytical results.

e. Analytical methodology, laboratory certification, and data reporting requirements. Systems must have samples analyzed pursuant to the specifications listed in this paragraph. The system must report, in a format acceptable to the department, the analytical results from the source water monitoring no later than ten days after the end of the first month following the month when the sample is collected.

(1) *Cryptosporidium*. Systems must have *Cryptosporidium* samples analyzed by a laboratory that is approved under EPA's Laboratory Quality Assurance Evaluation Program for Analysis of *Cryptosporidium* in Water.

1. These are the approved analytical methods for *Cryptosporidium*:

- "Method 1623: *Cryptosporidium* and *Giardia* in Water by Filtration/IMS/FA," 2005, US EPA, EPA-815-R-05-002. Available at www.nemi.gov;

- "Method 1622: *Cryptosporidium* in Water by Filtration/IMS/FA," 2005, US EPA, EPA-815-R-05-001. Available at www.nemi.gov; and

- "Method 1623.1: *Cryptosporidium* and *Giardia* in Water by Filtration/Immunomagnetic Separation/Immunofluorescence Assay Microscopy," 2012, EPA-816-R-12-001. Available at www.nepis.epa.gov.

2. Using one of the approved methods, the laboratory must analyze at least a 10 L sample or a packed pellet volume of at least 2 mL. Systems unable to process a 10 L sample must analyze as much sample volume as can be filtered by two filters specified in the method, up to a packed pellet volume of at least 2 mL.

3. A matrix spike (MS) sample must be spiked and filtered by the laboratory according to the approved method. If the volume of the MS sample is greater than 10 L, the system may filter all but 10 L of the MS sample in the field and ship the filtered sample and the remaining 10 L of source water to the laboratory. In this case, the laboratory must spike the remaining 10 L of water and filter it through the filter used to collect the balance of the sample in the field.

4. Flow cytometer-counted spiking suspensions must be used for the matrix spike samples and the ongoing precision and recovery samples.

5. The following data elements must be reported for each *Cryptosporidium* analysis:

- PWSID.
- Facility ID.
- Sample collection date.
- Sample type (i.e., field or matrix spike).
- Sample volume filtered (L), to the nearest 0.25 L.
- Whether 100 percent of the filtered volume was examined by the laboratory.
- Number of oocysts counted.
- For matrix spike samples: sample volume spiked and estimated number of oocysts spiked.
- For samples in which less than 10 L is filtered or less than 100 percent of the sample volume is examined: the number of filters used and the packed pellet volume.
- For samples in which less than 100 percent of sample volume is examined: the volume of resuspended concentrate and the volume of this resuspension processed through immunomagnetic separation.

(2) *E. coli*. Systems must have the *E. coli* samples analyzed by a laboratory certified by EPA, the National Environmental Laboratory Accreditation Conference, or the department for total coliform or fecal coliform analysis in drinking water samples using the same approved *E. coli* method for the analysis of source water.

1. The approved analytical methods for the enumeration of *E. coli* in source water are shown in Table 2.

Table 2: *E. coli* Analytical Methods

| Method | EPA | Standard Methods | Other |
|--|-------------------|---------------------------|---|
| Most probable number with multiple tube or multiple well ^{1, 2} | | 9223 B ¹¹ | 991.15 ⁴ Colilert ^{3, 5} Colilert-18 ^{3, 5, 6} |
| Membrane filtration, single step ^{1, 7, 8} | 1603 ⁹ | | m-ColiBlue24 ¹⁰ |
| Membrane filtration, two step | | 9222D/9222G ¹² | |

¹Tests must be conducted to provide organism enumeration (i.e., density). Select the appropriate configuration of tubes/filtrations and dilutions/volumes to account for the quality, consistency, and anticipated organism density in the water sample.

²Samples shall be enumerated by the multiple-tube or multiple-well procedure. Using multiple-tube procedures, employ an appropriate tube and dilution configuration of the sample as needed and report the Most Probable Number (MPN). Samples tested with Colilert® may be enumerated with the multiple-well procedures, Quanti-Tray®, Quanti-Tray® 2000, and the MPN calculated from the table provided by the manufacturer.

³These tests are collectively known as defined enzyme substrate tests, where, for example, a substrate is used to detect the enzyme beta-glucuronidase produced by *E. coli*.

⁴Association of Official Analytical Chemists, International. "Official Methods of Analysis of AOAC International, 16th Ed., Volume 1, Chapter 17, 1995. AOAC, 481 N. Frederick Ave., Suite 500, Gaithersburg, MD 20877-2417.

⁵Descriptions of the Colilert®, Colilert-18®, Quanti-Tray®, and Quanti-Tray® 2000 may be obtained from IDEXX Laboratories, Inc., 1 IDEXX Drive, Westbrook, ME 04092.

⁶Colilert-18® is an optimized formulation of the Colilert® for the determination of total coliforms and *E. coli* that provides results within 18 hours of incubation at 35 degrees C rather than the 24 hours required for the Colilert® test.

⁷The filter must be a 0.45 micron membrane filter or a membrane filter with another pore size certified by the manufacturer to fully retain organisms to be cultivated and to be free of extractables which could interfere with organism growth.

⁸When the membrane filter method has been used previously to test waters with high turbidity or large numbers of noncoliform bacteria, a parallel test should be conducted with a multiple-tube technique to demonstrate applicability and comparability of results.

⁹“Method 1603: *Escherichia coli* (*E. coli*) in Water by Membrane Filtration Using Modified Membrane-Thermotolerant *Escherichia coli* Agar (modified mTEC), USEPA, July 2006.” US EPA, Office of Water, Washington, DC, EPA 821-R-06-011. Available at www.nepis.epa.gov.

¹⁰A description of the m-ColiBlue24® test, Total Coliforms and *E. coli*, is available from Hach Company, 100 Dayton Ave., Ames, IA 50010.

¹¹Standard Methods for the Analysis of Water and Wastewater, 18th (1992), 19th (1995), and 20th (1998) editions, American Public Health Association. Available from APHA, 800 I Street, NW, Washington, DC 20001-3710.

¹²Standard Methods for the Examination of Water and Wastewater, 20th edition (1998). Available from APHA, 800 I Street, NW, Washington, DC 20001-3710.

2. The holding time (the time period from sample collection to initiation of analysis) shall not exceed 30 hours. The department may approve on a case-by-case basis an extension of the holding time to 48 hours, if the 30-hour holding time is not feasible. If the extension is allowed, the laboratory must use the Colilert® reagent version of the Standard Methods 9223B to conduct the analysis.

3. The samples must be maintained between 0 and 10 degrees C during storage and transit to the laboratory.

4. The following data elements must be reported for each *E. coli* analysis:

- PWSID.
- Facility ID.
- Sample collection date.
- Analytical method number.
- Method type.
- Source type (flowing stream or river; lake or reservoir; or influenced groundwater).
- Number of *E. coli* per 100 mL.
- Turbidity in NTU.

(3) Turbidity. The approved analytical methods for turbidity are listed in 43.5(4)“a”(1). Measurements of turbidity must be made by a party approved by the department, and reported on the laboratory data sheet with the corresponding *E. coli* sample.

43.11(4) Disinfection profiling and benchmarking.

a. General requirements. Following completion of the first round of source water monitoring, a system that plans to make a significant change to its disinfection practice must develop disinfection profiles and calculate disinfection benchmarks for *Giardia lamblia* and viruses.

(1) Notification to the department. The system must notify the department prior to changing its disinfection practice and must include in the notice the completed disinfection profile and disinfection benchmark for *Giardia lamblia* and viruses, a description of the proposed change in disinfection practice, and an analysis of how the proposed change will affect the current level of disinfection.

(2) Definition of “significant change.” A significant change to the disinfection practice is defined as follows:

1. Any change to the point of disinfection;
2. Any change to the disinfectant(s) used in the treatment plant;
3. Any change to the disinfection process; or
4. Any other modification identified by the department as a significant change to disinfection practice.

b. Developing the disinfection profile. In order to develop a disinfection profile, a system must monitor at least weekly for a period of 12 consecutive months to determine the total log inactivation for

Giardia lamblia and viruses. If a system monitors more frequently, the monitoring frequency must be evenly spaced. A system that operates for fewer than 12 months per year must monitor weekly during the period of operation. A system must determine log inactivation for *Giardia lamblia* through the entire plant, based on CT_{99.9} values in Appendix A, Tables 1 through 6, as applicable. Systems must determine log inactivation for viruses through the entire treatment plant based on a protocol approved by the department.

(1) Monitoring requirements. Systems with a single point of disinfectant application prior to the entrance to the distribution system must conduct the monitoring listed in this subparagraph. Systems with multiple points of disinfectant application must conduct the same monitoring for each disinfection segment. Systems must monitor the parameters necessary to determine the total inactivation ratio. The analytical methods for the parameters are listed in 43.5(4) "a." All measurements must be taken during peak hourly flow.

1. For systems using a disinfectant other than UV, the temperature of the disinfected water must be measured in degrees Celsius at each residual disinfectant concentration sampling point or at an alternative location approved by the department.

2. For systems using chlorine, the pH of the disinfected water must be measured at each chlorine residual disinfectant concentration sampling point or at an alternative location approved by the department.

3. The disinfectant contact time must be determined in minutes.

4. The residual disinfectant concentrations of the water must be determined in mg/L before or at the first customer and prior to each additional point of disinfectant application.

5. A system may use existing data to meet the monitoring requirements if the data are substantially equivalent to the required data, the system has not made any significant change to its treatment practice, and the system has the same source water as it had when the data were collected. Systems may develop disinfection profiles using up to three years of existing data.

6. A system may use disinfection profiles developed under 43.9(2) or 43.10(2) if the system has not made a significant change to its treatment practice and has the same source water as it had when the profile was developed. The virus profile must be developed using the same data on which the *Giardia lamblia* profile is based.

(2) Calculation of the total inactivation ratio for *Giardia lamblia*.

1. Systems using only one point of disinfectant application may determine the total inactivation ratio ($CT_{\text{calc}}/CT_{99.9}$) for the disinfection segment using either of the following methods.

- Determine one inactivation ratio before or at the first customer during peak hourly flow.

- Determine successive sequential inactivation ratios between the point of disinfectant application and a point before or at the first customer during peak hourly flow. Calculate the total inactivation ratio by determining the inactivation ratio for each sequence ($CT_{\text{calc}}/CT_{99.9}$) and adding the values together.

2. Systems using more than one point of disinfectant application before the first customer must determine the CT value of each disinfection segment immediately prior to the next point of disinfectant application, or for the final segment, before or at the first customer, during peak hourly flow. Calculate the ($CT_{\text{calc}}/CT_{99.9}$) value of each segment and add the values together to determine the total inactivation ratio.

3. Systems must then determine the total logs of inactivation by multiplying the total inactivation ratio by 3.0.

(3) Calculation of the total inactivation ratio for viruses. The system must calculate the log of inactivation for viruses using a protocol approved by the department.

c. *Calculation of the disinfection benchmark.*

(1) For each year of profiling data collected and calculated under this subrule, systems must determine the lowest mean monthly level of both *Giardia lamblia* and virus inactivation. Systems must determine the mean *Giardia lamblia* and virus inactivation for each calendar month for each year of profiling data by dividing the sum of daily or weekly *Giardia lamblia* and virus log inactivation by the number of values calculated for that month.

(2) For a system with one year of profiling data, the disinfection benchmark is the lowest monthly mean value. For a system with more than one year of profiling data, the disinfection benchmark is the mean of the lowest monthly mean values of *Giardia lamblia* and virus log inactivation in each year of profiling data.

43.11(5) Bin classification. Upon completion of the first round of source water monitoring, systems must calculate an initial *Cryptosporidium* bin concentration for each plant for which monitoring was required. Calculation of the bin concentration must use the *Cryptosporidium* results reported under 43.11(3)“a.”

a. Calculation of mean Cryptosporidium or bin concentration value.

(1) Systems that collect at least 48 samples. For systems that collect a total of at least 48 samples, the bin concentration is equal to the arithmetic mean of all sample concentrations.

(2) Systems that collect 24 to 47 samples. For systems that collect at least 24 samples but not more than 47 samples, the bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected.

(3) Systems serving fewer than 10,000 people and monitoring for only one year. For systems that serve fewer than 10,000 people and monitor *Cryptosporidium* for only one year (i.e., 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.

(4) Systems with plants operating on a part-time basis. For systems with plants operating only part of the year that monitor fewer than 12 months per year, the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

(5) If the monthly *Cryptosporidium* sampling frequency varies, systems must first calculate a monthly average for each month of monitoring. Systems must then use these monthly average concentrations, rather than individual sample concentrations, in the applicable calculation for bin classification.

b. Determination of bin classification.

(1) First monitoring round. A system must determine the bin classification from Table 3, using its calculated bin concentration from 43.11(5)“a.”

Table 3: Bin Classification Table

| System Type | <i>Cryptosporidium</i> Concentration, in oocysts/L | Bin Classification |
|--|--|--------------------|
| Systems required to monitor for <i>Cryptosporidium</i> under 43.11(3)“b”(1) or 43.11(3)“b”(2)“3” | Fewer than 0.075 oocysts/L | Bin 1 |
| | Between 0.075 and fewer than 1.0 oocysts/L | Bin 2 |
| | Between 1.0 and fewer than 3.0 oocysts/L | Bin 3 |
| | 3.0 oocysts/L or greater | Bin 4 |
| Systems serving fewer than 10,000 and not required to monitor for <i>Cryptosporidium</i> , pursuant to 43.11(3)“b”(2)“1” | Not applicable | Bin 1 |

(2) Second monitoring round. Following completion of the second round of source water monitoring, a system must recalculate its bin concentration and determine its new bin classification, using the same protocols outlined in 43.11(5)“a” and “b.”

c. Reporting bin classification to the department. Within six months of the end of the sampling period, the system must report its bin classification to the department for approval. The report must also include a summary of the source water monitoring data and the calculation procedure used to determine the bin classification.

d. Treatment technique violation. Failure to comply with 43.11(5)“b” and “c” is a violation of the treatment technique requirement.

43.11(6) Additional *Cryptosporidium* treatment requirements. A system must provide the level of additional treatment for *Cryptosporidium* specified in Table 4 based on its bin classification determined in 43.11(5) and according to the schedule in 43.11(7).

a. *Determination of additional Cryptosporidium treatment requirements.* Using Table 4, a system must determine any additional treatment requirements based upon its bin classification. The Bin 1 classification does not require any additional treatment. Bins 2 through 4 require additional *Cryptosporidium* treatment.

Table 4: Additional *Cryptosporidium* Treatment Requirements

| Bin Classification | Treatment Used by the System for Compliance with 43.5, 43.9, and 43.10 | | | |
|--------------------|--|-------------------------|--|-------------------------------------|
| | Conventional filtration (including softening) | Direct filtration | Slow sand or diatomaceous earth filtration | Alternative filtration technologies |
| Bin 1 | No additional treatment | No additional treatment | No additional treatment | No additional treatment |
| Bin 2 | 1-log treatment | 1.5-log treatment | 1-log treatment | At least 4.0-log ¹ |
| Bin 3 | 2-log treatment | 2.5-log treatment | 2-log treatment | At least 5.0-log ¹ |
| Bin 4 | 2.5-log treatment | 3-log treatment | 2.5-log treatment | At least 5.5-log ¹ |

¹The total *Cryptosporidium* removal and inactivation must be at least this value, as determined by the department.

b. *Treatment requirements for Bins 2 through 4.* A system that is classified as Bin 2, 3, or 4 must use one or more of the treatment and management options listed in 43.11(8) to comply with the required additional *Cryptosporidium* treatment. Systems classified as Bins 3 and 4 must achieve at least 1-log of the additional *Cryptosporidium* treatment required by using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or UV, as listed in 43.11(9) through 43.11(13).

c. *Treatment technique violation.* Failure by a system in any month to achieve treatment credit by meeting criteria in 43.11(9) through 43.11(13) that is at least equal to the level of treatment required in 43.11(6)“a” is a violation of the treatment technique requirement.

d. *Significant changes to the watershed.* If, after the system’s completion of source water monitoring (either round), the department determines during a sanitary survey or an equivalent source water assessment that significant changes occurred in the system’s watershed that could lead to increased contamination of the source water by *Cryptosporidium*, the system must take actions specified by the department to address the contamination. These actions may include additional source water monitoring and implementing microbial toolbox options listed in 43.11(8).

43.11(7) Schedule for compliance with *Cryptosporidium* treatment requirements. Following the initial bin classification under 43.11(5), systems must provide the level of treatment for *Cryptosporidium* required in 43.11(6), according to the schedule in Table 5. If the bin classification of a system changes following the second round of source water monitoring, the system must provide the level of treatment for *Cryptosporidium* required in 43.11(6), on a schedule approved by the department.

Table 5: *Cryptosporidium* Treatment Compliance Dates

| Schedule | Population Served by System | Compliance Date for <i>Cryptosporidium</i> treatment requirements ¹ |
|----------|------------------------------|--|
| 1 | At least 100,000 people | April 1, 2012 |
| 2 | From 50,000 to 99,999 people | October 1, 2012 |
| 3 | From 10,000 to 49,999 people | October 1, 2013 |
| 4 | Fewer than 10,000 people | October 1, 2014 |

¹The department may allow up to an additional two years for compliance with the treatment requirement if the system must make capital improvements.

43.11(8) Microbial toolbox options for meeting *Cryptosporidium* treatment requirements. Systems receive the treatment credits listed in Table 6 by meeting the conditions for microbial toolbox options

described in 43.11(9) through 43.11(13). Systems apply these treatment credits to meet the treatment requirements in 43.11(6). Table 6 summarizes options in the microbial toolbox.

Table 6: Microbial Toolbox Summary Table: Options, Treatment Credits, and Criteria

| Toolbox Option | Specific Criteria Rule | <i>Cryptosporidium</i> treatment credit with design and implementation criteria |
|--|------------------------|--|
| Source Protection and Management Toolbox Options | | |
| Watershed control program | 43.11(9) | 0.5-log credit for department-approved program comprising required elements, annual program status report to department, and regular watershed survey. |
| Alternative source/intake management | 43.11(9) "b" | No prescribed credit. Systems may conduct simultaneous monitoring for treatment bin classification at alternative intake locations or under alternative intake management strategies. |
| Prefiltration Toolbox Options | | |
| Presedimentation basin with coagulation | 43.11(10) "a" | 0.5-log credit during any month that presedimentation basins achieve a monthly mean reduction of 0.5-log or greater in turbidity or alternative department-approved performance criteria. To be eligible, basins must be operated continuously with coagulant addition and all plant flow must pass through the basins. |
| Two-stage lime softening | 43.11(10) "b" | 0.5-log credit for two-stage softening where chemical addition and hardness precipitation occur in both stages. All plant flow must pass through both stages. Single-stage softening is credited as equivalent to conventional treatment. |
| Bank filtration | 43.11(10) "c" | 0.5-log credit for 25-foot setback; 1.0-log credit for 50-foot setback; aquifer must be unconsolidated sand containing at least 10 percent fines; average turbidity in wells must be less than 1 NTU. A system using a well followed by filtration when conducting source water monitoring must sample the well to determine bin classification and is not eligible for additional credit. |
| Treatment Performance Toolbox Options | | |
| Combined filter performance | 43.11(11) "a" | 0.5-log credit for combined filter effluent turbidity less than or equal to 0.15 NTU in at least 95 percent of measurements each month. |
| Individual filter performance | 43.11(11) "b" | 0.5-log credit (in addition to the 0.5-log combined filter performance credit) if individual filter effluent turbidity is less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter and is never greater than 0.3 NTU in two consecutive measurements in any filter. |
| Demonstration of performance | 43.11(11) "c" | Credit awarded to unit process or treatment train based on a demonstration to the department with a department-approved protocol. |
| Additional Filtration Toolbox Options | | |
| Bag or cartridge filters (individual filters) | 43.11(12) "a" | Up to 2-log credit based on the removal efficiency demonstrated during challenge testing with a 1.0-log factor of safety. |

| Toolbox Option | Specific Criteria Rule | <i>Cryptosporidium</i> treatment credit with design and implementation criteria |
|--------------------------------------|------------------------|---|
| Bag or cartridge filters (in series) | 43.11(12)“a” | Up to 2.5-log credit based on the removal efficiency demonstrated during challenge testing with a 0.5-log factor of safety. |
| Membrane filtration | 43.11(12)“b” | Log credit equivalent to removal efficiency demonstrated in challenge test for device if supported by direct integrity testing. |
| Second-stage filtration | 43.11(12)“c” | 0.5-log credit for second separate granular media filtration stage if treatment train includes coagulation prior to first filter. |
| Slow sand filtration | 43.11(12)“d” | 2.5-log credit as a secondary filtration step; 3.0-log credit as a primary filtration process. No prior chlorination for either option. |
| Inactivation Toolbox Options | | |
| Chlorine dioxide | 43.11(13) | Log credit based on measured CT in relation to CT table. |
| Ozone | 43.11(13) | Log credit based on measured CT in relation to CT table. |
| Ultraviolet light (UV) | 43.11(13) | Log credit based on validated UV dose in relation to UV dose table; reactor validation testing required to establish UV dose and associated operating conditions. |

43.11(9) Source toolbox components.

a. Watershed control program. Systems receive 0.5-log *Cryptosporidium* treatment credit for implementing a watershed control program that meets the requirements of this paragraph.

(1) Notification. Systems that intend to apply for the watershed control program credit must notify the department of this intent no later than two years prior to the treatment compliance date in 43.11(7) applicable to the system.

(2) Proposed watershed control plan. Systems must submit to the department a proposed watershed control plan no later than one year before the applicable treatment compliance date in 43.11(7). The department must approve the watershed control plan for the system to receive watershed control program treatment credit. The watershed control plan must include the following elements:

1. Identification of an “area of influence” outside of which the likelihood of *Cryptosporidium* or fecal contamination affecting the treatment plant intake is not significant. This is the area to be evaluated in future watershed surveys under 43.11(9)“a”(5)“2.”

2. Identification of both potential and actual sources of *Cryptosporidium* contamination and an assessment of the relative impact of these sources on the system’s source water quality.

3. An analysis of the effectiveness and feasibility of control measures that could reduce *Cryptosporidium* loading from sources of contamination to the system’s source water.

4. A statement of goals and specific actions the system will undertake to reduce source water *Cryptosporidium* levels. The plan must explain how the actions are expected to contribute to specific goals, identify watershed partners and their roles, identify resource requirements and commitments, and include a schedule for plan implementation with deadlines for completing specific actions identified in the plan.

(3) Existing watershed control programs. Systems with watershed control programs that were in place on January 5, 2006, are eligible to seek this credit. The systems’ watershed control plans must meet the criteria in 43.11(9)“a”(2) and must specify ongoing and future actions that will reduce source water *Cryptosporidium* levels.

(4) Department response to submitted plan. If the department does not respond to a system regarding approval of a watershed control plan submitted under this subrule and the system meets the other requirements of this subrule, the watershed control program will be considered approved and

0.5-log *Cryptosporidium* treatment credit will be awarded unless and until the department subsequently withdraws such approval.

(5) System requirements to maintain 0.5-log credit. Systems must complete the following actions to maintain the 0.5-log credit.

1. Submit an annual watershed control program status report to the department. The annual watershed control program status report must describe the system's implementation of the approved plan and assess the adequacy of the plan to meet its goals. The plan must explain how the system is addressing any shortcomings in plan implementation, including those previously identified by the department or as a result of the watershed survey conducted under 43.11(9) "a"(5) "2." It must also describe any significant changes that have occurred in the watershed since the last watershed sanitary survey. If a system determines during implementation that making a significant change to its approved watershed control program is necessary, the system must notify the department prior to making any such changes. If any change is likely to reduce the level of source water protection, the system must also list in its notification the actions the system will take to mitigate this effect.

2. Undergo a watershed sanitary survey every three years for community water systems and every five years for noncommunity water systems and submit the survey report to the department. The survey must be conducted according to department guidelines and by persons acceptable to the department.

- The watershed sanitary survey must meet the following criteria: encompass the region identified in the department-approved watershed control plan as the area of influence; assess the implementation of actions to reduce source water *Cryptosporidium* levels; and identify any significant new sources of *Cryptosporidium*.

- If the department determines that significant changes may have occurred in the watershed since the previous watershed sanitary survey, systems must undergo another watershed sanitary survey by the date specified by the department, which may be earlier than the regular schedule of a three- or five-year frequency.

3. The system must make the watershed control plan, annual status reports, and watershed sanitary survey reports available to the public upon request. These documents must be in a plain language style and include criteria by which to evaluate the success of the program in achieving plan goals. The department may approve systems to withhold portions of an annual status report, watershed control plan, and watershed sanitary survey from the public, based on water supply security considerations.

(6) Withdrawal of watershed control program treatment credit. If the department determines that a system is not carrying out the approved watershed control plan, the department may withdraw the watershed control program treatment credit.

b. Alternative source. A system may conduct source water monitoring that reflects a different intake location (either in the same source or for an alternate source) or a different procedure for the timing or level of withdrawal from the source (alternative source monitoring). If the department approves, a system may determine its bin classification under 43.11(5) based on alternative source monitoring results.

(1) Systems conducting alternative source monitoring must also monitor their current plan intake concurrently, as described in 43.11(3).

(2) Alternative source monitoring must meet the requirements for source monitoring to determine bin classification, as described in 43.11(3). Systems must report to the department the alternative source monitoring results and provide supporting information documenting the operating conditions under which the samples were collected.

(3) If a system determines its bin classification under 43.11(5) using alternative source monitoring results that reflect a different intake location or a different procedure for managing the timing or level of withdrawal from the source, the system must relocate the intake or permanently adopt the withdrawal procedure, as applicable, no later than the applicable treatment compliance date in 43.11(7).

43.11(10) Prefiltration treatment toolbox components.

a. Presedimentation. Systems receive 0.5-log *Cryptosporidium* treatment credit for a presedimentation basin during any month the process meets the criteria in this paragraph.

(1) The presedimentation basin must be in continuous operation and must treat the entire plant flow taken from a surface water or influenced groundwater source.

- (2) The system must continuously add a coagulant to the presedimentation basin.
- (3) The presedimentation basin must achieve either of the following performance criteria:
 1. Demonstrates at least 0.5-log mean reduction of influent turbidity. This reduction must be determined using daily turbidity measurements in the presedimentation process influent and effluent and must be calculated as follows: $\text{LOG}_{10}(\text{monthly mean of daily influent turbidity}) - \text{LOG}_{10}(\text{monthly mean of daily effluent turbidity})$.
 2. Complies with department-approved performance criteria that demonstrate at least 0.5-log mean removal of micron-sized particulate material through the presedimentation process.
 - b. *Two-stage lime softening.* Systems receive an additional 0.5-log *Cryptosporidium* treatment credit for a two-stage lime softening plant if chemical addition and hardness precipitation occur in two separate and sequential softening stages prior to filtration. Both softening stages must treat the entire plant flow taken from a surface water or influenced groundwater source.
 - c. *Bank filtration.* Systems receive *Cryptosporidium* treatment credit for bank filtration that serves as pretreatment to a filtration plant by meeting the criteria in this paragraph. Systems using bank filtration when they begin source water monitoring under 43.11(3)“a” must collect samples as described in 43.11(3)“d”(3) and are not eligible for this credit.
 - (1) Treatment credit. Wells with a groundwater flow path of at least 25 feet receive 0.5-log treatment credit; wells with a groundwater flow path of at least 50 feet receive 1.0-log treatment credit. The groundwater flow path must be determined as specified in 43.11(10)“c”(4).
 - (2) Granular aquifers only. Only wells in granular aquifers are eligible for treatment credit. Granular aquifers are those comprised of sand, clay, silt, rock fragments, pebbles or larger particles, and minor cement. A system must characterize the aquifer at the well site to determine aquifer properties. Systems must extract a core from the aquifer and demonstrate that in at least 90 percent of the core length, grains less than 1.0 mm in diameter constitute at least 10 percent of the core material.
 - (3) Horizontal and vertical wells only. Only horizontal and vertical wells are eligible for treatment credit.
 - (4) Measurement of groundwater flow path. For vertical wells, the groundwater flow path is the measured distance from the edge of the surface water body under high flow conditions (determined by the 100-year floodplain elevation boundary or by the floodway, as defined in Federal Emergency Management Agency flood hazard maps) to the well screen. For horizontal wells, the groundwater flow path is the measured distance from the bed of the river under normal flow conditions to the closest horizontal well lateral screen.
 - (5) Turbidity monitoring at the wellhead. Systems must monitor each wellhead for turbidity at least once every four hours while the bank filtration process is in operation. If monthly average turbidity levels, based on daily maximum values in the well, exceed 1 NTU, the system must report this result to the department and conduct an assessment within 30 days to determine the cause of the high turbidity levels in the well. If the department determines that microbial removal has been compromised, the department may revoke treatment credit until the system implements corrective actions approved by the department to remediate the problem.
 - (6) Springs and infiltration galleries. This treatment credit is not eligible for springs and infiltration galleries. Springs and infiltration galleries are eligible for credit through demonstration of performance study under 43.11(11)“c.”
 - (7) Bank filtration demonstration of performance. The department may approve *Cryptosporidium* treatment credit for bank filtration based on a demonstration of performance study that meets the criteria in this subparagraph. This treatment credit may be greater than 1.0-log and may be awarded to bank filtration that does not meet the criteria in 43.11(10)“c”(1) to (5).
 1. The study must follow a protocol approved by the department and must involve the collection of data on the removal of *Cryptosporidium* or a surrogate for *Cryptosporidium* and related hydrogeologic and water quality parameters during the full range of operating conditions.

2. The study must include sampling both from the production well(s) and from monitoring wells that are screened and located along the shortest flow path between the surface water source and the production well(s).

43.11(11) Treatment performance toolbox components. This option pertains to physical treatment processes.

a. Combined filter performance. Systems using conventional filtration treatment or direct filtration treatment receive an additional 0.5-log *Cryptosporidium* treatment credit during any month the system meets the criteria in this paragraph. Combined filter effluent (CFE) turbidity must be less than or equal to 0.15 NTU in at least 95 percent of the measurements. Turbidity must be measured as described in 43.5(4) and, if applicable, 43.10(4).

b. Individual filter performance. Systems using conventional filtration treatment or direct filtration treatment receive 0.5-log *Cryptosporidium* treatment credit during any month the system meets the criteria in this paragraph, which can be in addition to the CFE 0.5-log credit from 43.11(11)“a.” Compliance with these criteria must be based on individual filter turbidity monitoring as described in 43.9(4) or 43.10(5), as appropriate.

(1) The filtered water turbidity for each individual filter must be less than or equal to 0.15 NTU in at least 95 percent of the measurements recorded each month.

(2) No individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart.

(3) Any system that has received treatment credit for individual filter performance and fails to meet the requirements of 43.11(11)“b”(2) and (3) during any month shall not receive a treatment technique violation under 43.11(6) if the department determines the following:

1. The failure was due to unusual and short-term circumstances that could not reasonably be prevented through optimizing the treatment plant design, operation, and maintenance.

2. The system has experienced no more than two such failures in any calendar year.

c. Demonstration of performance. The department may approve *Cryptosporidium* treatment credit for drinking water treatment processes based on a demonstration of performance study that meets the criteria in this paragraph. This treatment credit may be greater than or less than the prescribed treatment credits in 43.11(6) or 43.11(10) through 43.11(13) and may be awarded to treatment processes that do not meet the criteria for the prescribed credits.

(1) Systems cannot receive the prescribed treatment credit for any toolbox option in 43.11(10) through 43.11(13) if that toolbox option is included in a demonstration of performance study for which treatment credit is awarded under this paragraph.

(2) The demonstration of performance study must follow a department-approved protocol and must demonstrate the level of *Cryptosporidium* reduction the treatment process will achieve under the full range of expected operating conditions for the system.

(3) Approval by the department must be in writing and may include monitoring and treatment performance criteria that the system must demonstrate and report on an ongoing basis to remain eligible for the treatment credit. The department may designate such criteria where necessary to verify that the conditions under which the demonstration of performance credit was approved are maintained during routine operation.

43.11(12) Additional filtration toolbox components.

a. Bag and cartridge filters. By meeting the criteria in this paragraph, systems receive *Cryptosporidium* treatment credit of up to 2.0-log for the use of individual bag or cartridge filters and up to 2.5-log for the use of bag or cartridge filters operated in series. To be eligible for this credit, systems must report the results of challenge testing that meets the requirements of 43.11(12)“a”(2) through 43.11(12)“a”(9) to the department. The filters must treat the entire plant flow taken from a surface water or influenced groundwater source.

(1) The *Cryptosporidium* treatment credit awarded for use of bag or cartridge filters must be based on the removal efficiency demonstrated during challenge testing that is conducted in accordance with the criteria in 43.11(12)“a”(2) through 43.11(12)“a”(9). A safety factor equal to 1-log for individual bag or cartridge filters and 0.5-log for bag or cartridge filters in series must be applied to challenge testing

results to determine removal credit. Systems may use results from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria specified in this paragraph.

(2) Challenge testing must be performed on full-scale bag or cartridge filters, and the associated filter housing or pressure vessel, that are identical in material and construction to the filters and housings the system will use for removal of *Cryptosporidium*. Bag or cartridge filters must be challenge tested in the same configuration that the system will use, either as individual filters or as a series configuration of filters.

(3) Challenge testing must be conducted using *Cryptosporidium* or a surrogate that is removed no more efficiently than *Cryptosporidium*. The microorganism or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate must be determined using a method capable of discretely quantifying the specific microorganisms or surrogate used in the test; gross measurements such as turbidity shall not be used.

(4) The maximum feed water concentration that can be used during a challenge test must be based on the detection limit of the challenge particulate in the filtrate (i.e., filtrate detection limit) and must be calculated using this equation:

$$\text{Maximum Feed Water Concentration} = 10,000 \times \text{Filtrate Detection Limit}$$

(5) Challenge testing must be conducted at the maximum design flow rate for the filter as specified by the manufacturer.

(6) Each filter evaluated must be tested for a duration sufficient to reach 100 percent of the terminal pressure drop, which thereby establishes the maximum pressure drop under which the filter may be used to comply with the requirements of this paragraph.

(7) Removal efficiency of a filter must be determined from the results of the challenge test and expressed in terms of log removal values using the following equation:

$$\text{LRV} = \text{LOG}_{10}(C_f) - \text{LOG}_{10}(C_p)$$

Where:

LRV = log removal value demonstrated during challenge test;

C_f = the feed concentration measured during the challenge test; and

C_p = the filtrate concentration measured during the challenge test.

Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p must be set equal to the detection limit.

(8) Each filter tested must be challenged with the challenge particulate during three periods over the filtration cycle: within two hours of start-up of a new filter; when the pressure drop is between 45 and 55 percent of the terminal pressure drop; and at the end of the cycle after the pressure drop has reached 100 percent of the terminal pressure drop. An LRV must be calculated for each of these challenge periods for each filter tested. The LRV for the filter ($\text{LRV}_{\text{filter}}$) must be assigned the value of the minimum LRV observed during the three challenge periods for that filter.

(9) If fewer than 20 filters are tested, the overall removal efficiency for the filter product line must be set equal to the lowest $\text{LRV}_{\text{filter}}$ among the filters tested. If 20 or more filters are tested, the overall removal efficiency for the filter product line must be set equal to the tenth percentile of the set of $\text{LRV}_{\text{filter}}$ values for the various filters tested. The percentile is defined by $[i/(n+1)]$ where “i” is the rank of “n” individual data points ordered lowest to highest. If necessary, the tenth percentile may be calculated using linear interpolation.

(10) If a previously tested filter is modified in a manner that could change the removal efficiency of the filter product line, challenge testing to demonstrate the removal efficiency of the modified filter must be conducted and submitted to the department.

b. Membrane filtration.

(1) Systems receive *Cryptosporidium* treatment credit for using membrane filtration that meets the criteria of this paragraph. Systems using membrane cartridge filters that meet the definition of membrane filtration in 567—40.2(455B) are eligible for this credit. The level of treatment credit a system receives is equal to the lower of the values determined under the following two paragraphs:

1. The removal efficiency demonstrated during challenge testing conducted under the criteria in 43.11(12)“b”(2).

2. The maximum removal efficiency that can be verified through direct integrity testing used with the membrane filtration process under the conditions in 43.11(12)“b”(3).

(2) Challenge testing. The membrane used by the system must undergo challenge testing to evaluate removal efficiency, and the system must report the results of challenge testing to the department. Challenge testing must be conducted according to the criteria listed in this subparagraph. Systems may use data from challenge testing conducted prior to January 5, 2006, if the prior testing was consistent with the criteria listed in this subparagraph.

1. Challenge testing must be conducted on either a full-scale membrane module, identical in material and construction to the membrane modules used in the system’s treatment facility, or a smaller-scale membrane module, identical in material and similar in construction to the full-scale module. A module is defined as the smallest component of a membrane unit in which a specific membrane surface area is housed in a device with a filtrate outlet structure.

2. Challenge testing must be conducted using *Cryptosporidium* oocysts or a surrogate that is removed no more efficiently than *Cryptosporidium* oocysts. The organisms or surrogate used during challenge testing is referred to as the challenge particulate. The concentration of the challenge particulate, in both the feed and filtrate water, must be determined using a method capable of discretely quantifying the specific challenge particulate used in the test; gross measurements such as turbidity shall not be used.

3. The maximum feed water concentration that can be used during a challenge test is based on the detection limit of the challenge particulate in the filtrate and must be determined according to the following equation:

$$\text{Maximum Feed Water Concentration} = 3,160,000 \times \text{Filtrate Detection Limit}$$

4. Challenge testing must be conducted under representative hydraulic conditions at the maximum design flux and maximum design process recovery specified by the manufacturer for the membrane module. Flux is defined as the throughput of a pressure-driven membrane process expressed as flow per unit of membrane area. Recovery is defined as the volumetric percent of feed water that is converted to filtrate over the course of an operating cycle uninterrupted by events such as chemical cleaning or a solids removal process (i.e., backwashing).

5. Removal efficiency of a membrane module must be calculated from the challenge test results and expressed as a log removal value according to the following equation:

$$\text{LRV} = \text{LOG}_{10}(C_f) - \text{LOG}_{10}(C_p)$$

Where:

LRV = log removal value demonstrated during challenge test;

C_f = the feed concentration measured during the challenge test; and

C_p = the filtrate concentration measured during the challenge test.

Equivalent units must be used for the feed and filtrate concentrations. If the challenge particulate is not detected in the filtrate, the term C_p must be set equal to the detection limit for the purpose of calculating the LRV. An LRV must be calculated for each membrane module evaluated during the challenge test.

6. The removal efficiency of a membrane filtration process demonstrated during challenge testing must be expressed as a log removal value ($\text{LRV}_{C\text{-Test}}$). If fewer than 20 modules are tested, then $\text{LRV}_{C\text{-Test}}$ is equal to the lowest of the representative LRVs among the modules tested. If 20 or more modules are tested, then $\text{LRV}_{C\text{-Test}}$ is equal to the tenth percentile of the representative LRVs among the modules tested. The percentile is defined by $[i/(n+1)]$ where “i” is the rank of “n” individual data points ordered lowest to highest. If necessary, the tenth percentile may be calculated using linear interpolation.

7. The challenge test must establish a quality control release value (QCRV) for a nondestructive performance test that demonstrates the *Cryptosporidium* removal capability of the membrane filtration module. In order to verify *Cryptosporidium* removal capability, this performance test must be applied to each production membrane module that was not directly challenge tested but was used by the system.

Production modules that do not meet the established QCRV are not eligible for the treatment credit demonstrated during the challenge test.

8. If a previously tested membrane is modified in a manner that could change the removal efficiency of the membrane or the applicability of the nondestructive performance test and associated QCRV, additional challenge testing to demonstrate the removal efficiency of the modified membrane must be conducted and submitted to the department, along with determination of a new QCRV.

(3) Direct integrity testing. Systems must conduct direct integrity testing in a manner that demonstrates a removal efficiency equal to or greater than the removal credit awarded for the membrane filtration process and meets the requirements described in this subparagraph. A direct integrity test is defined as a physical test applied to a membrane unit in order to identify and isolate integrity breaches (i.e., one or more leaks that could result in contamination of the filtrate).

1. The direct integrity test must be independently applied to each membrane unit in service. A membrane unit is defined as a group of membrane modules that share common valving that allows the unit to be isolated from the rest of the system for the purpose of integrity testing or other maintenance.

2. The direct integrity method must have a resolution of 3 micrometers or less, where resolution is defined as the size of the smallest integrity breach that contributes to a response from the direct integrity test.

3. The direct integrity test must have a sensitivity sufficient to verify the log treatment credit awarded by the department for the membrane filtration process, where sensitivity is defined as the maximum log removal value that can be reliably verified by a direct integrity test. Sensitivity must be determined using the approach in either of the following paragraphs as applicable to the type of direct integrity test the system uses.

- For direct integrity tests using applied pressure or vacuum, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = \text{LOG}_{10} [Q_p / (\text{VCF} \times Q_{\text{breach}})]$$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test;

Q_p = total design filtrate flow from the membrane unit;

Q_{breach} = flow of water from an integrity breach associated with the smallest integrity test response that can be reliably measured; and

VCF = volumetric concentration factor, which is the ratio of the suspended solids concentration on the high-pressure side of the membrane relative to that in the feed water.

- For direct integrity tests using a particulate or molecular marker, the direct integrity test sensitivity must be calculated according to the following equation:

$$LRV_{DIT} = \text{LOG}_{10} (C_f) - \text{LOG}_{10} (C_p)$$

Where:

LRV_{DIT} = the sensitivity of the direct integrity test;

C_f = the typical feed concentration of the marker used in the test; and

C_p = the filtrate concentration of the marker from an integral membrane unit.

4. Systems must establish a control limit within the sensitivity limits of the direct integrity test that is indicative of an integral membrane unit capable of meeting the removal credit awarded by the department.

5. If the result of a direct integrity test exceeds the control limit established under 43.11(12)“b”(3)“4,” the system must remove the membrane unit from service. Systems must conduct a direct integrity test to verify any repairs and may return the membrane unit to service only if the direct integrity test is within the established control limit.

6. Systems must conduct direct integrity testing on each membrane unit at a frequency of not less than once each day that the membrane unit is in operation. The department may approve less frequent testing, based on demonstrated process reliability, the use of multiple barriers effective for *Cryptosporidium*, or reliable process safeguards.

(4) Indirect integrity monitoring. Systems must conduct continuous indirect integrity monitoring on each membrane unit according to the following criteria. Indirect integrity monitoring is defined as monitoring some aspect of filtrate water quality that is indicative of the removal of particulate matter. A system that implements continuous direct integrity testing of membrane units in accordance with the criteria in 43.11(12)“b”(3) is not subject to the requirements for continuous indirect integrity monitoring. Systems must submit a monthly report to the department summarizing all continuous indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken in each case.

1. Unless the department approves an alternative parameter, continuous indirect integrity monitoring must include continuous filtrate turbidity monitoring.

2. Continuous monitoring must be conducted at a frequency of no less than once every 15 minutes.

3. Continuous monitoring must be separately conducted on each membrane unit.

4. If indirect integrity monitoring includes turbidity and if the filtrate turbidity readings are above 0.15 NTU for a period greater than 15 minutes (i.e., two consecutive 15-minute readings above 0.15 NTU), direct integrity testing must immediately be performed on the associated membrane unit as specified in 43.11(12)“b”(3)“1” through 43.11(12)“b”(3)“5.”

5. If indirect integrity monitoring includes a department-approved alternative parameter and if the alternative parameter exceeds a department-approved control limit for a period greater than 15 minutes, direct integrity testing must immediately be performed on the associated membrane units as specified in 43.11(12)“b”(3)“1” through 43.11(12)“b”(3)“5.”

c. Second-stage filtration. Systems receive 0.5-log *Cryptosporidium* treatment credit for using a separate second stage of filtration that consists of sand, dual media, GAC, or other fine-grain media following granular media filtration if the department approves. To be eligible for this credit, the first stage of filtration must be preceded by a coagulation step and both filtration stages must treat the entire plant flow taken from a surface water or influenced groundwater source. A cap, such as GAC, on a single stage of filtration is not eligible for this credit. The department must approve the treatment credit based on an assessment of the design characteristics of the filtration process.

d. Slow sand filtration (as secondary filter). Systems are eligible to receive 2.5-log *Cryptosporidium* treatment credit for using a slow sand filtration process that follows a separate stage of filtration if both filtration stages treat entire plant flow taken from a surface water or influenced groundwater source and no disinfectant residual is present in the influent water to the slow sand filtration process. The department must base its approval of the treatment credit on an assessment of the design characteristics of the filtration process. This does not apply to treatment credit awarded for slow sand filtration used as a primary filtration process.

43.11(13) Inactivation toolbox components.

a. Calculation of CT values.

(1) CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). Systems with treatment credit for chlorine dioxide or ozone under 43.11(13)“b” or “c” must calculate CT at least once each day, with both C and T measured during peak hourly flow as specified in 43.5(4).

(2) Systems with several disinfection segments in sequence may calculate CT for each segment, where a disinfection segment is defined as a treatment unit process with a measureable disinfectant residual level and a liquid volume. Under this approach, systems must add the *Cryptosporidium* CT values in each segment to determine the total CT for the treatment plant.

b. CT values for chlorine dioxide and ozone.

(1) As described in 43.11(13)“a,” systems receive the *Cryptosporidium* treatment credit listed in Table 1 of Appendix B by meeting the corresponding chlorine dioxide CT value for the applicable water temperature.

(2) As described in 43.11(13)“a,” systems receive the *Cryptosporidium* treatment credit listed in Table 2 of Appendix B by meeting the corresponding ozone CT value for the applicable water temperature.

c. Site-specific study. The department may approve alternative chlorine dioxide or ozone CT values to those listed in 43.11(13)“b” on a site-specific basis. The department must base its approval on a site-specific study conducted by the system. The study must follow a department-approved protocol.

d. Ultraviolet light. Systems receive *Cryptosporidium*, *Giardia lamblia*, and virus treatment credits for ultraviolet (UV) light reactors by achieving the corresponding UV dose values shown in Table 3 of Appendix B. Systems must use the following procedures to validate and monitor UV reactors in order to demonstrate that the reactors are achieving a particular UV dose value for treatment credit.

(1) Reactor validation testing. Systems must use UV reactors that have undergone validation testing to determine the operating conditions under which the reactor delivers the required UV dose (i.e., validated operating conditions). These operating conditions must include flow rate, UV intensity as measured by a UV sensor, and UV lamp status.

1. When determining validated operating conditions, systems must account for the following factors: UV absorbance of the water; lamp fouling and aging; measurement uncertainty of on-line sensors; UV dose distributions arising from the velocity profiles through the reactor; failure of UV lamps or other critical system components; and inlet and outlet piping or channel configurations of the UV reactor.

2. Validation testing must include the following: full-scale testing of a reactor that conforms uniformly to the UV reactors used by the system and inactivation of a test microorganism whose dose response characteristics have been quantified with a low-pressure mercury vapor lamp.

3. The department may approve an alternative approach to validation testing.

(2) Reactor monitoring.

1. Systems must monitor their UV reactors to determine if the reactors are operating within validated conditions, as determined under 43.11(13)“d”(1). This monitoring must include UV sensor, flow rate, lamp status, and other parameters the department designates based on UV reactor operation. Systems must verify the calibration of UV sensors and must recalibrate sensors in accordance with a protocol approved by the department.

2. To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose. Systems must demonstrate compliance with this condition by the monitoring required under 43.11(13)“d”(2)“1.”

43.11(14) Reporting requirements.

a. Sampling schedules and monitoring results. Systems must report source water sampling schedules and monitoring results under 43.11(3)“c” and 43.11(3)“e,” unless the systems notify the department that they will not conduct source water monitoring due to meeting the criteria of 5.5-log treatment for *Cryptosporidium* under 43.11(3)“a.”

b. Cryptosporidium bin classification. Systems must report their *Cryptosporidium* bin classification determined under 43.11(5).

c. Disinfection profiles and benchmarks. Systems must report disinfection profiles and benchmarks to the department as described in 43.11(4)“a” and 43.11(4)“b” prior to making a significant change in disinfection practice.

d. Microbial toolbox options. Systems must report to the department in accordance with Table 7 for any microbial toolbox options used to comply with treatment requirements under 43.11(6).

Table 7: Microbial Toolbox Reporting Requirements

| Toolbox Option | Systems must submit this information | Information must be submitted on this schedule |
|---|---|---|
| 1. Watershed control program | Notice of intention to develop a new or continue an existing watershed control program | No later than two years before the applicable treatment compliance date in 43.11(7) |
| | Watershed control plan | No later than one year before the applicable treatment compliance date in 43.11(7) |
| | Annual watershed control program status report | Every 12 months, beginning one year after the applicable treatment compliance date in 43.11(7) |
| | Watershed sanitary survey report | - For community water systems, every three years beginning three years after the applicable treatment compliance date in 43.11(7) - For noncommunity water systems, every five years beginning five years after the applicable treatment compliance date in 43.11(7) |
| 2. Alternative source/intake management | Verification that system has relocated the intake or adopted the intake withdrawal procedure reflected in monitoring results | No later than the applicable treatment compliance date in 43.11(7) |
| 3. Presedimentation | Monthly verification of the following: - Continuous basin operation - Treatment of 100 percent of the flow - Continuous addition of a coagulant - At least 0.5-log mean reduction of influent turbidity or compliance with alternative department-approved performance criteria | Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 4. Two-stage lime softening | Monthly verification of the following: - Chemical addition and hardness precipitation occurred in two separate and sequential softening stages prior to filtration - Both stages treated 100 percent of plant flow | Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 5. Bank filtration | Initial demonstration of the following: - Unconsolidated, predominantly sandy aquifer - Setback distance of at least 25 feet for 0.5-log credit or 50 feet for 1.0-log credit | No later than the applicable treatment compliance date in 43.11(7) |
| | If monthly average of daily maximum turbidity is greater than 1 NTU, then system must report result and submit an assessment of the cause. | Report within 30 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 6. Combined filter performance | Monthly verification of combined filter effluent (CFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of the 4-hour CFE measurements taken each month | Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |

| Toolbox Option | Systems must submit this information | Information must be submitted on this schedule |
|--------------------------------------|--|---|
| 7. Individual filter performance | Monthly verification of the following: - Individual filter effluent (IFE) turbidity levels less than or equal to 0.15 NTU in at least 95 percent of samples each month in each filter - No individual filter effluent turbidity levels greater than 0.3 NTU in two consecutive readings 15 minutes apart | Monthly reporting within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 8. Demonstration of performance | Results from testing following a department-approved protocol | No later than the applicable treatment compliance date in 43.11(7) |
| | As required by the department, monthly verification of operation within conditions of department approval for demonstration of performance credit | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 9. Bag filters and cartridge filters | Demonstration that the following criteria are met: - Process meets the definition of bag or cartridge filtration - Removal efficiency established through challenge testing that meets criteria in this subpart | No later than the applicable treatment compliance date in 43.11(7) |
| | Monthly verification that 100 percent of plant flow was filtered | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 10. Membrane filtration | Results of verification testing demonstrating the following: - Removal efficiency established through challenge testing that meets criteria - Integrity test method and parameters, including resolution, sensitivity, test frequency, control limits, and associated baseline | No later than the applicable treatment compliance date in 43.11(7) |
| | Monthly report summarizing the following: - All direct integrity tests above the control limit - If applicable, any turbidity or alternative department-approved indirect integrity monitoring results triggering direct integrity testing and the corrective action that was taken | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 11. Second-stage filtration | Monthly verification that 100 percent of flow was filtered through both stages and that first stage was preceded by coagulation step | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |

| Toolbox Option | Systems must submit this information | Information must be submitted on this schedule |
|--|---|---|
| 12. Slow sand filtration as a secondary filter | Monthly verification that both a slow sand filter and a preceding separate stage of filtration treated 100 percent of the flow from surface or influenced groundwater sources | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 13. Chlorine dioxide | Summary of CT values for each day as described in 43.11(13) | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 14. Ozone | Summary of CT values for each day as described in 43.11(13) | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |
| 15. Ultraviolet light (UV) | Validation test results demonstrating operating conditions that achieve required UV dose | No later than the applicable treatment compliance date in 43.11(7) |
| | Monthly report summarizing the percentage of water entering the distribution system that was not treated by UV reactors operating within validated conditions for the required dose as specified in 43.11(13) "d" | Within 10 days following the month in which the monitoring was conducted, beginning on the applicable treatment compliance date in 43.11(7) |

43.11(15) Record-keeping requirements.

a. Source water monitoring records. Systems must keep results from the initial round of source water monitoring under 43.11(3) "a" and the second round of source water monitoring under 43.11(3) "b" until three years after bin classification under 43.11(5) for the particular round of monitoring.

b. Systems meeting 5.5-log treatment for Cryptosporidium. Systems must keep for three years records of any notification to the department that the systems will meet the 5.5-log *Cryptosporidium* treatment requirements and avoid source water monitoring.

c. Microbial toolbox treatment monitoring records. Systems must keep the results of treatment monitoring associated with microbial toolbox options under 43.11(8) through 43.11(13) for three years. [ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—43.12(455B) Optimization goals.

43.12(1) Turbidity optimization goals. Surface water and IGW systems must meet the requirements listed in 567—43.5(455B), 567—43.9(455B), and 567—43.10(455B). To encourage operational optimization, the department has adopted the following goals for systems using surface water or influenced groundwater and that wish to pursue the optimization of their existing treatment processes. These goals are voluntary. Data collected for optimization purposes will not be used to determine compliance with the requirements in 567—43.5(455B), 567—43.9(455B), 567—43.10(455B), or 567—43.11(455B) unless the optimization data are identical to the compliance data.

a. Sedimentation performance goals. The sedimentation performance goals are based upon the average annual raw water turbidity levels.

(1) When the annual average raw water turbidity is less than or equal to 10 NTU over the course of the calendar year, the turbidity should be less than or equal to 1 NTU in at least 95 percent of measurements based on the maximum daily value of readings taken at least once every four hours from each sedimentation basin while the plant is operating.

(2) When the annual average raw water turbidity is more than 10 NTU over the course of the calendar year, the turbidity should be less than or equal to 2 NTU in at least 95 percent of measurements based on the maximum daily value of readings taken at least once every four hours from each sedimentation basin while the plant is operating.

b. Individual filter performance goals. The individual filter performance goals depend upon the system's capability of filtering to waste.

(1) For systems that have the capability of filtering to waste, the individual filter turbidity should be less than or equal to 0.10 NTU in at least 95 percent of measurements over the course of the calendar year, based on the daily maximum value of readings recorded at least once per minute while the plant is in operation. The maximum individual filter turbidity must not exceed 0.30 NTU at any time. The filter must return to service with a turbidity of 0.10 NTU or less.

(2) For systems that do not have the capability of filtering to waste, the individual filter turbidity should be less than or equal to 0.10 NTU in at least 95 percent of measurements over the course of the calendar year, excepting the 15 minutes following the completion of the backwash process, based on the daily maximum value of readings recorded at least once per minute while the plant is in operation. The maximum individual filter turbidity must not exceed 0.30 NTU following backwash and must return to a level at or below 0.10 NTU within 15 minutes of returning the filter to service.

c. Combined filter performance goal. The combined filter performance goal has two components:

(1) Combined filter effluent turbidity should be less than or equal to 0.10 NTU in at least 95 percent of measurements over the course of the calendar year, based on daily maximum value of readings recorded at least once per minute while the plant is operating.

(2) The maximum individual filter turbidity must not exceed 0.30 NTU at any time.

43.12(2) Disinfection optimization goals. Reserved.
[ARC 9915B, IAB 12/14/11, effective 1/18/12]

TABLE A: SEPARATION DISTANCES FROM WELLS

Rescinded IAB 1/7/04, effective 2/11/04

TABLE B

Minimum Self-Monitoring Requirements
Public Water Supply Systems

[Prior to 12/12/90, appeared in 567—Ch 41, Table D]

Rescinded IAB 8/11/99, effective 9/15/99

APPENDIX A: CT_{99,9} TABLES FOR DISINFECTION PROFILINGTABLE 1: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 0.5°C or Lower¹

| Free Residual Chlorine, mg/L | pH | | | | | | |
|------------------------------|------|-----|-----|-----|-----|-----|------|
| | ≤6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | ≤9.0 |
| ≤0.4 | 137 | 163 | 195 | 237 | 277 | 329 | 390 |
| 0.6 | 141 | 168 | 200 | 239 | 286 | 342 | 407 |
| 0.8 | 145 | 172 | 205 | 246 | 295 | 354 | 422 |
| 1.0 | 148 | 176 | 210 | 253 | 304 | 365 | 437 |
| 1.2 | 152 | 180 | 215 | 259 | 313 | 376 | 451 |
| 1.4 | 155 | 184 | 221 | 266 | 321 | 387 | 464 |
| 1.6 | 157 | 189 | 226 | 273 | 329 | 397 | 477 |
| 1.8 | 162 | 193 | 231 | 279 | 338 | 407 | 489 |
| 2.0 | 165 | 197 | 236 | 286 | 346 | 417 | 500 |
| 2.2 | 169 | 201 | 242 | 297 | 353 | 426 | 511 |
| 2.4 | 172 | 205 | 247 | 298 | 361 | 435 | 522 |
| 2.6 | 175 | 209 | 252 | 304 | 368 | 444 | 533 |
| 2.8 | 178 | 213 | 257 | 310 | 375 | 452 | 543 |
| 3.0 | 181 | 217 | 261 | 316 | 382 | 460 | 552 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature and at the higher pH.

TABLE 2: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 5.0°C¹

| Free Residual Chlorine, mg/L | pH | | | | | | |
|------------------------------|------|-----|-----|-----|-----|-----|------|
| | ≤6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | ≤9.0 |
| ≤0.4 | 97 | 117 | 139 | 166 | 198 | 236 | 279 |
| 0.6 | 100 | 120 | 143 | 171 | 204 | 244 | 291 |
| 0.8 | 103 | 122 | 146 | 175 | 210 | 252 | 301 |
| 1.0 | 105 | 125 | 149 | 179 | 216 | 260 | 312 |
| 1.2 | 107 | 127 | 152 | 183 | 221 | 267 | 320 |
| 1.4 | 109 | 130 | 155 | 187 | 227 | 274 | 329 |
| 1.6 | 111 | 132 | 158 | 192 | 232 | 281 | 337 |
| 1.8 | 114 | 135 | 162 | 196 | 238 | 287 | 345 |
| 2.0 | 116 | 138 | 165 | 200 | 243 | 294 | 353 |
| 2.2 | 118 | 140 | 169 | 204 | 248 | 300 | 361 |
| 2.4 | 120 | 143 | 172 | 209 | 253 | 306 | 368 |
| 2.6 | 122 | 146 | 175 | 213 | 258 | 312 | 375 |
| 2.8 | 124 | 148 | 178 | 217 | 263 | 318 | 382 |
| 3.0 | 126 | 151 | 182 | 221 | 268 | 324 | 389 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature and at the higher pH.

TABLE 3: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 10.0°C¹

| Free Residual Chlorine, mg/L | pH | | | | | | |
|------------------------------|------|-----|-----|-----|-----|-----|------|
| | ≤6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | ≤9.0 |
| ≤0.4 | 73 | 88 | 104 | 125 | 149 | 177 | 209 |
| 0.6 | 75 | 90 | 107 | 128 | 153 | 183 | 218 |
| 0.8 | 78 | 92 | 110 | 131 | 158 | 189 | 226 |
| 1.0 | 79 | 94 | 112 | 134 | 162 | 195 | 234 |
| 1.2 | 80 | 95 | 114 | 137 | 166 | 200 | 240 |
| 1.4 | 82 | 98 | 116 | 140 | 170 | 206 | 247 |
| 1.6 | 83 | 99 | 119 | 144 | 174 | 211 | 253 |
| 1.8 | 86 | 101 | 122 | 147 | 179 | 215 | 259 |
| 2.0 | 87 | 104 | 124 | 150 | 182 | 221 | 265 |
| 2.2 | 89 | 105 | 127 | 153 | 186 | 225 | 271 |
| 2.4 | 90 | 107 | 129 | 157 | 190 | 230 | 276 |
| 2.6 | 92 | 110 | 131 | 160 | 194 | 234 | 281 |
| 2.8 | 93 | 111 | 134 | 163 | 197 | 239 | 287 |
| 3.0 | 95 | 113 | 137 | 166 | 201 | 243 | 292 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature and at the higher pH.

TABLE 4: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 15.0°C¹

| Free Residual Chlorine, mg/L | pH | | | | | | |
|------------------------------|------|-----|-----|-----|-----|-----|------|
| | ≤6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | ≤9.0 |
| ≤0.4 | 49 | 59 | 70 | 83 | 99 | 118 | 140 |
| 0.6 | 50 | 60 | 72 | 86 | 102 | 122 | 146 |
| 0.8 | 52 | 61 | 73 | 88 | 105 | 126 | 151 |
| 1.0 | 53 | 63 | 75 | 90 | 108 | 130 | 156 |
| 1.2 | 54 | 64 | 76 | 92 | 111 | 134 | 160 |
| 1.4 | 55 | 65 | 78 | 94 | 114 | 137 | 165 |
| 1.6 | 56 | 66 | 79 | 96 | 116 | 141 | 169 |
| 1.8 | 57 | 68 | 81 | 98 | 119 | 144 | 173 |
| 2.0 | 58 | 69 | 83 | 100 | 122 | 147 | 177 |
| 2.2 | 59 | 70 | 85 | 102 | 124 | 150 | 181 |
| 2.4 | 60 | 72 | 86 | 105 | 127 | 153 | 184 |
| 2.6 | 61 | 73 | 88 | 107 | 129 | 156 | 188 |
| 2.8 | 62 | 74 | 89 | 109 | 132 | 159 | 191 |
| 3.0 | 63 | 76 | 91 | 111 | 134 | 162 | 195 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature and at the higher pH.

TABLE 5: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 20.0°C¹

| Free Residual Chlorine, mg/L | pH | | | | | | |
|------------------------------|------|-----|-----|-----|-----|-----|------|
| | ≤6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | ≤9.0 |
| ≤0.4 | 36 | 44 | 52 | 62 | 74 | 89 | 105 |
| 0.6 | 38 | 45 | 54 | 64 | 77 | 92 | 109 |
| 0.8 | 39 | 46 | 55 | 66 | 79 | 95 | 113 |
| 1.0 | 39 | 47 | 56 | 67 | 81 | 98 | 117 |
| 1.2 | 40 | 48 | 57 | 69 | 83 | 100 | 120 |
| 1.4 | 41 | 49 | 58 | 70 | 85 | 103 | 123 |
| 1.6 | 42 | 50 | 59 | 72 | 87 | 105 | 126 |
| 1.8 | 43 | 51 | 61 | 74 | 89 | 108 | 129 |
| 2.0 | 44 | 52 | 62 | 75 | 91 | 110 | 132 |
| 2.2 | 44 | 53 | 63 | 77 | 93 | 113 | 135 |
| 2.4 | 45 | 54 | 65 | 78 | 95 | 115 | 138 |
| 2.6 | 46 | 55 | 66 | 80 | 97 | 117 | 141 |
| 2.8 | 47 | 56 | 67 | 81 | 99 | 119 | 143 |
| 3.0 | 47 | 57 | 68 | 83 | 101 | 122 | 146 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature and at the higher pH.

TABLE 6: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Free Chlorine at 25.0°C and Higher¹

| Free Residual Chlorine, mg/L | pH | | | | | | |
|------------------------------|------|-----|-----|-----|-----|-----|------|
| | ≤6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | ≤9.0 |
| ≤0.4 | 24 | 29 | 35 | 42 | 50 | 59 | 70 |
| 0.6 | 25 | 30 | 36 | 43 | 51 | 61 | 73 |
| 0.8 | 26 | 31 | 37 | 44 | 53 | 63 | 75 |
| 1.0 | 26 | 31 | 37 | 45 | 54 | 65 | 78 |
| 1.2 | 27 | 32 | 38 | 46 | 55 | 67 | 80 |
| 1.4 | 27 | 33 | 39 | 47 | 57 | 69 | 82 |
| 1.6 | 28 | 33 | 40 | 48 | 58 | 70 | 84 |
| 1.8 | 29 | 34 | 41 | 49 | 60 | 72 | 86 |
| 2.0 | 29 | 35 | 41 | 50 | 61 | 74 | 88 |
| 2.2 | 30 | 35 | 42 | 51 | 62 | 75 | 90 |
| 2.4 | 30 | 36 | 43 | 52 | 63 | 77 | 92 |
| 2.6 | 31 | 37 | 44 | 53 | 65 | 78 | 94 |
| 2.8 | 31 | 37 | 45 | 54 | 66 | 80 | 96 |
| 3.0 | 32 | 38 | 46 | 55 | 67 | 81 | 97 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated pH values may be determined by linear interpolation. Any CT values between the indicated temperatures of different tables may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature and at the higher pH.

TABLE 7: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Chlorine Dioxide and Ozone¹

| Disinfectant | Temperature, °C | | | | | |
|------------------|-----------------|-----|-----|------|------|------|
| | <1 | 5 | 10 | 15 | 20 | ≥25 |
| Chlorine Dioxide | 63 | 26 | 23 | 19 | 15 | 11 |
| Ozone | 2.9 | 1.9 | 1.4 | 0.95 | 0.72 | 0.48 |

¹These CT values achieve greater than a 99.99 percent inactivation of viruses. Any CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature for determining CT_{99,9} values between indicated temperatures.

TABLE 8: CT Values (CT_{99,9}) for 99.9 Percent Inactivation of *Giardia lamblia* Cysts by Chloramines¹

| Disinfectant | Temperature, °C | | | | | |
|--------------|-----------------|------|------|------|------|-----|
| | <1 | 5 | 10 | 15 | 20 | 25 |
| Chloramines | 3800 | 2200 | 1850 | 1500 | 1100 | 750 |

¹These values are for pH values of 6 to 9. These CT values may be assumed to achieve greater than 99.99 percent inactivation of viruses only if chlorine is added and mixed in the water prior to the addition of ammonia. If this condition is not met, the system must demonstrate, based on on-site studies or other information, as approved by the department, that the system is achieving at least 99.99 percent inactivation of viruses. Any CT values between the indicated temperatures may be determined by linear interpolation. If no interpolation is used, use the CT_{99,9} value at the lower temperature for determining CT_{99,9} values between indicated temperatures.

APPENDIX B: CT TABLES FOR *CRYPTOSPORIDIUM* INACTIVATIONTABLE 1: CT Values (mg-min/L) for *Cryptosporidium* Inactivation by Chlorine Dioxide¹

| Log Credit | Water Temperature, °C | | | | | | | | | | |
|------------|-----------------------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | ≤0.5 | 1 | 2 | 3 | 5 | 7 | 10 | 15 | 20 | 25 | 30 |
| 0.25 | 159 | 153 | 140 | 128 | 107 | 90 | 69 | 45 | 29 | 19 | 12 |
| 0.5 | 319 | 305 | 279 | 256 | 214 | 180 | 138 | 89 | 58 | 38 | 24 |
| 1.0 | 637 | 610 | 558 | 511 | 429 | 360 | 277 | 179 | 116 | 75 | 49 |
| 1.5 | 956 | 915 | 838 | 767 | 643 | 539 | 415 | 268 | 174 | 113 | 73 |
| 2.0 | 1275 | 1220 | 1117 | 1023 | 858 | 719 | 553 | 357 | 232 | 150 | 98 |
| 2.5 | 1594 | 1525 | 1396 | 1278 | 1072 | 899 | 691 | 447 | 289 | 188 | 122 |
| 3.0 | 1912 | 1830 | 1675 | 1534 | 1286 | 1079 | 830 | 536 | 347 | 226 | 147 |

¹Systems may use this equation to determine log credit between the indicated values:

$$\text{Log credit} = [0.001506 \times (1.09116)^{\text{Temp}}] \times \text{CT}$$

TABLE 2: CT Values (mg-min/L) for *Cryptosporidium* Inactivation by Ozone¹

| Log Credit | Water Temperature, °C | | | | | | | | | | |
|------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| | ≤0.5 | 1 | 2 | 3 | 5 | 7 | 10 | 15 | 20 | 25 | 30 |
| 0.25 | 6.0 | 5.8 | 5.2 | 4.8 | 4.0 | 3.3 | 2.5 | 1.6 | 1.0 | 0.6 | 0.39 |
| 0.5 | 12 | 12 | 10 | 9.5 | 7.9 | 6.5 | 4.9 | 3.1 | 2.0 | 1.2 | 0.78 |
| 1.0 | 24 | 23 | 21 | 19 | 16 | 13 | 9.9 | 6.2 | 3.9 | 2.5 | 1.6 |
| 1.5 | 36 | 35 | 31 | 29 | 24 | 20 | 15 | 9.3 | 5.9 | 3.7 | 2.4 |
| 2.0 | 48 | 46 | 42 | 38 | 32 | 26 | 20 | 12 | 7.8 | 4.9 | 3.1 |
| 2.5 | 60 | 58 | 52 | 48 | 40 | 33 | 25 | 16 | 9.8 | 6.2 | 3.9 |
| 3.0 | 72 | 69 | 63 | 57 | 47 | 39 | 30 | 19 | 12 | 7.4 | 4.7 |

¹Systems may use this equation to determine log credit between the indicated values:

$$\text{Log credit} = [0.0397 \times (1.09757)^{\text{Temp}}] \times \text{CT}$$

TABLE 3: UV Dose for *Cryptosporidium*, *Giardia lamblia*, and Virus Inactivation Credit¹

| Log Credit | <i>Cryptosporidium</i> UV dose (mJ/cm ²) | <i>Giardia lamblia</i> UV dose (mJ/cm ²) | Virus UV dose (mJ/cm ²) |
|------------|---|---|--|
| 0.5 | 1.6 | 1.5 | 39 |
| 1.0 | 2.5 | 2.1 | 58 |
| 1.5 | 3.9 | 3.0 | 79 |
| 2.0 | 5.8 | 5.2 | 100 |
| 2.5 | 8.5 | 7.7 | 121 |
| 3.0 | 12 | 11 | 143 |
| 3.5 | 15 | 15 | 163 |
| 4.0 | 22 | 22 | 186 |

¹The treatment credits listed in Table 3 are for UV light at a wavelength of 254 nm as produced by a low-pressure mercury vapor lamp. To receive treatment credit for other lamp types, systems must demonstrate an equivalent germicidal dose through reactor validation testing. The UV dose values in this table are applicable only to post-filter applications of UV in filtered systems.
[ARC 9915B, IAB 12/14/11, effective 1/18/12]

APPENDIX C: CT TABLES FOR VIRUS INACTIVATION UNDER THE GROUNDWATER RULE,
567—41.7(455B)

TABLE 1: CT Values (mg-min/L) for Inactivation of Viruses by Free Chlorine, pH 6.0-9.0¹

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|-----|-----|-----|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2 | 5.8 | 5.3 | 4.9 | 4.4 | 4.0 | 3.8 | 3.6 | 3.4 | 3.2 |
| 3 | 8.7 | 8.0 | 7.3 | 6.7 | 6.0 | 5.6 | 5.2 | 4.8 | 4.4 |
| 4 | 11.6 | 10.7 | 9.8 | 8.9 | 8.0 | 7.6 | 7.2 | 6.8 | 6.4 |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|--|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| 2 | 3.0 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | 1.8 | 1.6 | |
| 3 | 4.0 | 3.8 | 3.6 | 3.4 | 3.2 | 3.0 | 2.8 | 2.6 | |
| 4 | 6.0 | 5.6 | 5.2 | 4.8 | 4.4 | 4.0 | 3.8 | 3.6 | |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|-----|-----|-----|-----|-----|-----|-----|--|
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| 2 | 1.4 | 1.2 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| 3 | 2.4 | 2.2 | 2.0 | 1.8 | 1.6 | 1.4 | 1.2 | 1.0 | |
| 4 | 3.4 | 3.2 | 3.0 | 2.8 | 2.6 | 2.4 | 2.2 | 2.0 | |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

TABLE 2: CT Values (mg-min/L) for Inactivation of Viruses by Free Chlorine, pH 9.1-10.0

| Inactivation Log Credit | Water Temperature, °C | | | | | |
|----------------------------|-----------------------|----|----|----|----|----|
| | 0.5 | 5 | 10 | 15 | 20 | 25 |
| 2 | 45 | 30 | 22 | 15 | 11 | 7 |
| 3 | 66 | 44 | 33 | 22 | 16 | 11 |
| 4 | 90 | 60 | 45 | 30 | 22 | 15 |

TABLE 3: CT Values (mg-min/L) for Inactivation of Viruses by Chlorine Dioxide, pH 6.0-9.0¹

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|------|------|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2 | 8.4 | 7.7 | 7.0 | 6.3 | 5.6 | 5.3 | 5.0 | 4.8 | 4.5 |
| 3 | 25.6 | 23.5 | 21.4 | 19.2 | 17.1 | 16.2 | 15.4 | 14.5 | 13.7 |
| 4 | 50.1 | 45.9 | 41.8 | 37.6 | 33.4 | 31.7 | 30.1 | 28.4 | 26.8 |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|------|------|------|------|------|------|--|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| 2 | 4.2 | 3.9 | 3.6 | 3.4 | 3.1 | 2.8 | 2.7 | 2.5 | |
| 3 | 12.8 | 12.0 | 11.1 | 10.3 | 9.4 | 8.6 | 8.2 | 7.7 | |
| 4 | 25.1 | 23.4 | 21.7 | 20.1 | 18.4 | 16.7 | 15.9 | 15.0 | |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|------|------|------|------|-----|-----|--|
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| 2 | 2.4 | 2.2 | 2.1 | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | |
| 3 | 7.3 | 6.8 | 6.4 | 6.0 | 5.6 | 5.1 | 4.7 | 4.3 | |
| 4 | 14.2 | 13.3 | 12.5 | 11.7 | 10.9 | 10.0 | 9.2 | 8.4 | |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

TABLE 4: CT Values (mg-min/L) for Inactivation of Viruses by Ozone¹

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|------|------|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 2 | 0.90 | 0.83 | 0.75 | 0.68 | 0.60 | 0.58 | 0.56 | 0.54 | 0.52 |
| 3 | 1.40 | 1.28 | 1.15 | 1.03 | 0.90 | 0.88 | 0.86 | 0.84 | 0.82 |
| 4 | 1.80 | 1.65 | 1.50 | 1.35 | 1.20 | 1.16 | 1.12 | 1.08 | 1.04 |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|------|------|------|------|------|------|--|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| 2 | 0.50 | 0.46 | 0.42 | 0.38 | 0.34 | 0.30 | 0.29 | 0.28 | |
| 3 | 0.80 | 0.74 | 0.68 | 0.62 | 0.56 | 0.50 | 0.48 | 0.46 | |
| 4 | 1.00 | 0.92 | 0.84 | 0.76 | 0.68 | 0.60 | 0.58 | 0.56 | |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

| Inactivation Log Credit | Water Temperature, °C | | | | | | | | |
|----------------------------|-----------------------|------|------|------|------|------|------|------|--|
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| 2 | 0.27 | 0.26 | 0.25 | 0.23 | 0.21 | 0.19 | 0.17 | 0.15 | |
| 3 | 0.44 | 0.42 | 0.40 | 0.37 | 0.34 | 0.31 | 0.28 | 0.25 | |
| 4 | 0.54 | 0.52 | 0.50 | 0.46 | 0.42 | 0.38 | 0.34 | 0.30 | |

¹CT values provided in the table are modified by linear interpolation between 0.5°C increments.

No CT table is provided for chloramines or total chlorine because the CT values would be prohibitively high for groundwater systems.

Tables are from the EPA Groundwater Rule Implementation Guidance, EPA 816-R-09-004, January 2009, pages 97-98.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code sections 455B.171 through 455B.188 and 455B.190 through 455B.192.

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¹ Effective date of 43.2(3)“b”(1) to (9) and 43.3(3)“b”(1) and (2) delayed until adjournment of the 1995 General Assembly by the Administrative Rules Review Committee at its meeting held March 13, 1995.

CHAPTER 44
DRINKING WATER STATE REVOLVING FUND

567—44.1(455B) Statutory authority. The authority for the Iowa department of natural resources to administer the drinking water state revolving fund (DWSRF) in order to assist in the construction of drinking water treatment facilities is provided by Iowa Code sections 455B.291 to 455B.299.

567—44.2(455B) Scope of title. The department has jurisdiction over the surface water and groundwater of the state to prevent, abate, and control pollution. As a part of that general responsibility, the department and the Iowa finance authority (authority) are jointly designated to administer the DWSRF loan program to assist in the financing of infrastructure projects pursuant to the Safe Drinking Water Act (SDWA). A project must comply with this chapter to be eligible for a DWSRF loan. This chapter provides the background, the general rules of practice for the department's administration of the program, including the criteria for loan eligibility, and the general project and program administration rules.

567—44.3(455B) Purpose. The DWSRF provides financial assistance to eligible public water systems for the design and construction of facilities to ensure public health and the provision of safe and adequate drinking water. The DWSRF reserves a certain percentage of money each year from capitalization grants: for administrative purposes (up to 4 percent), to assist with the administration of the public water supply supervision program (up to 10 percent), to provide technical assistance to smaller drinking water systems (up to 2 percent) and to fund local assistance and other authorized activities (up to 15 percent). The director will coordinate with the authority under the terms of an interagency agreement entered into pursuant to Iowa Code chapter 28E. The department establishes priorities for the use of the DWSRF and publishes them in its intended use plan (IUP). The IUP will identify all proposed uses of available funds. All potentially funded projects or activities must be approved by the department.

The EPA provides capitalization grants for this program to the department. Financial assistance projects must be in conformance with the requirements of the Public Health Service Act (42 U.S.C. 300f et seq.), United States Code, Title XIV, Section 1452, Part E.

567—44.4(455B) Definitions. Definitions provided in 567—Chapter 40 apply to this chapter.

567—44.5(455B) Set-asides. The Safe Drinking Water Act (SDWA) authorizes set-aside funds to enable states to implement specific requirements of the SDWA. The amount and use of set-aside money is set each year in the IUP pursuant to rule 567—44.8(455B) and may be adjusted from year to year based on available funds and priorities as outlined in the IUP. As prescribed in the SDWA, set-asides will include but are not limited to:

44.5(1) Administration expense set-aside. These set-aside funds are to be used to administer the DWSRF. Up to 4 percent of the funds allotted through federal capitalization grants may be used for the reasonable costs of administering the programs and providing technical assistance. These costs may include such activities as issuing debt; DWSRF program start-up costs; audit costs; financial, management and legal consulting fees; development of IUP and priority ranking system; development of affordability criteria; and cost of support services provided by other state agencies. If the entire 4 percent is not obligated for administrative costs in one year, the excess balance may be reserved and used for administrative costs in later years.

44.5(2) Small system technical assistance set-aside. These set-aside funds will be used to provide technical assistance to public water supplies serving 10,000 people or fewer. Up to 2 percent of funds allotted through federal capitalization grants may be used for this purpose. These funds may be used to support a technical assistance team or to contract with outside organizations to provide technical assistance. Applications for third-party technical assistance proposals must be submitted and will be accepted and evaluated pursuant to subrules 44.7(2) through 44.7(7) prior to publication of the IUP in a given year. If the entire 2 percent is not obligated for these activities in one year, the excess balance may be reserved and used for the same activities in later years.

44.5(3) Local assistance and other state programs set-aside. Funds from this set-aside may be used for other categories of activities to assist development or implementation of local drinking water protection initiatives or both. Up to 15 percent of the capitalization grant amount may be used for the following activities, with the stipulation that not more than 10 percent of the capitalization grant amount may be used for any one activity:

- a. Assistance, in the form of a loan, to a public water system to acquire land or a conservation easement for source water protection purposes;
- b. Assistance, in the form of a loan, to a community water system to implement voluntary, incentive-based source water quality protection measures;
- c. Establishment and implementation of wellhead protection programs; and
- d. Provision of funding to a public water system to implement technical or financial assistance under the capacity development strategy.

Source water (quality partnership) petition programs (made by individual or consortiums of public water systems) established under Section 1454 of the SDWA amendments of 1996 (P.L. 104-182, August 6, 1996) will be eligible for money under this set-aside. Applications for third-party source water petition proposals must be submitted and will be accepted and evaluated pursuant to subrules 44.7(2) through 44.7(7) prior to publication of the IUP in a given year. These funds may not be reserved for future use.

44.5(4) State program management set-aside. Funds from this set-aside may be reserved for public water supply supervision (PWSS) programs, including the following uses:

- a. Administration of the state PWSS program;
- b. Administration or provision of technical assistance through source water protection programs, which include the Class V portion of the Underground Injection Control Program;
- c. Development and implementation of a capacity development strategy; and
- d. Development and implementation of an operator certification program.

This set-aside allows a maximum of 10 percent of the total available federal capitalization grant in a particular year and requires a one-to-one match. If the entire 10 percent is not obligated for these activities in one year, the excess balance may be reserved and used for the same activities in later years.

567—44.6(455B) Eligibility.

44.6(1) Eligible systems. The following systems are eligible to receive funds from the DWSRF for improvements as listed and defined in the Safe Drinking Water Act amendments of 1996 (P.L. 104-182, August 6, 1996).

- a. Community drinking water systems.
- b. Nonprofit nontransient noncommunity drinking water systems.
- c. Cities and counties that are PWS or can become viable new PWS as a result of this project.
- d. Any other governmental subdivision of the state responsible for a public water supply.

44.6(2) Ineligible systems. The following systems are ineligible to receive funds from the DWSRF.

- a. Any applicant that has not adopted and implemented satisfactory department-approved water conservation plans and practices, or demonstrated to the department an ongoing effort to adopt and implement such plans and practices within one calendar year from the date of the loan agreement.
- b. Any applicant in significant noncompliance with any applicable primary drinking water regulation, unless the project will return the applicant to compliance.
- c. Any applicant lacking viability (an applicant whose system lacks technical, financial, and managerial viability to comply with the SDWA and is nonviable or lacks capacity according to the definition of the SDWA), unless the applicant commits to undertake appropriate changes in operations, including ownership, management accounting, rates, maintenance, consolidation, alternative sources of water supply, or other procedures if the director determines that such changes are necessary to demonstrate viability.

d. Projects and activities deemed ineligible for participation in the DWSRF by the U.S. Environmental Protection Agency's Drinking Water State Revolving Fund regulations (40 CFR Part 35, Subpart L) or program guidance, or by the department.

44.6(3) *Certified operator requirement.* A system without a certified operator shall not receive loan assistance. The system must submit to the department the name, certification number and certification expiration date of the operator certified, pursuant to 567—Chapter 81, to be directly responsible (in direct responsible charge) for the operation of the facility before receiving a loan.

567—44.7(455B) Project point ranking system (project priority list).

44.7(1) *Project priority list.* The director shall develop and maintain a project priority list of public water systems that have a need for either a new or an upgraded drinking water system, including individual subcomponents. The term “public water system projects” may also include separate segments or phases of a segmented or phased project. The project priority list may include projects which are not ready to proceed (e.g., the list may include projects that by their nature are planned and implemented for a longer term than one year or projects that are unable to be implemented within one calendar year). Projects may be construed as not ready to proceed due to emergencies experienced by the applicant (or the state), or due to construction or other scheduling constraints. Projects will continue to be eligible for loan funding when funded for the first year of a multiyear project effort.

44.7(2) *Application.* Applications for placement on the project priority list shall be accepted by the department on a continuous basis.

44.7(3) *Amendment of project priority list.* The department may amend the project priority list to add eligible projects or remove projects. List adjustment can be done to ensure that the department uses at least 15 percent of each capitalization grant and required state match to provide loan assistance to systems serving fewer than 10,000 persons (allowable under Section 1452(a)(2) of SDWA), to the extent that there are a sufficient number of eligible projects to fund.

44.7(4) *Preliminary engineering study requirements.* To be eligible for placement on the project priority list for a construction loan, the water system must have a preliminary engineering study of potential system needs (e.g., a “planning” study) approved by the department, and must submit to the director a written application for placement on the list. The application must include:

- a. A description of the type of project for which financial assistance is being requested;
- b. The amount of financial assistance being requested; and
- c. A proposed project construction schedule.

Application shall be made on the form from the DWSRF application package provided by the department; the applicant may include additional information in the application. Forms may be obtained from the Environmental Services Division, Iowa Department of Natural Resources, Water Supply Engineering Section, 401 SW 7th Street, Suite M, Des Moines, Iowa 50309, or at www.iowasrf.com.

44.7(5) *Construction project requirements.* An applicant seeking financial assistance for construction must include with the application:

- a. A description of the entity’s current drinking water supply system, including a discussion of existing and potential problems or failures in the current drinking water system and compliance with state and federal criteria;
- b. An estimate of the population and the number of households to be served;
- c. A completed Self-Assessment Manual for Iowa Water System Viability;
- d. A description of the basis for project design;
- e. A map showing the geographical area that the project is expected to serve; and
- f. A cost estimate for the selected project.

44.7(6) *Project priority list ranking criteria.* A construction project’s priority points shall be the total number of points assigned by the department pursuant to the department’s scoring system, delineated in subrule 44.7(7). All projects shall be listed in descending order on the published project priority list according to the number of total priority points assigned each project. When two or more projects have the same priority point total, the project sponsored by a system in the process of consolidation shall receive the higher priority. A private system in the process of forming and becoming a PWS shall have the next highest priority (if the system is determined by U.S. EPA regulations or guidance to be eligible for DWSRF funding), and the entity with the smallest served population shall receive the next highest priority. The most current official census population shall be used for all municipalities which

serve only the population within their incorporated boundaries and which apply for these loan funds. For all other municipalities and other community public water supply systems and for nontransient noncommunity systems, population will be counted based on either the actual population verifiable by the department or population as calculated by multiplying by an occupancy factor of 2.5 persons per service connection. New systems will be counted based on census data, an occupancy factor of 2.5 persons per service connection, an occupancy factor of 2.5 persons per identifiable occupied building, or other means acceptable to the department. Funding shall be offered to the projects with highest rank on the project priority list, subject to the project's readiness to proceed, and shall proceed from the highest project downward, subject to availability of funds. The published project priority list shall also be included in the department's intended use plan (IUP), pursuant to rule 567—44.8(455B). Projects involving a multiyear, phased effort may carry over their original priority point total from the previous year's application, provided that the project owner reapplies at each stage.

44.7(7) Project priority list scoring criteria. Eligible public drinking water supply projects shall be scored pursuant to the following priority point scoring system.

IOWA DWSRF PROJECT SCORING SYSTEM

(Multiple attributes within a lettered subcategory are not additive, but points are additive from other subcategories; consolidation/restructuring is an approved option to correct violations or “improve” treatment.)

| Scoring Criterion | Points |
|--|--------|
| A. Human Health Risk-related Criteria (maximum of 60 points) | |
| 1. Correction of acute MCL or Tier I treatment technique violation as defined in 567—paragraph 42.1(2)“a” (fecal coliform, nitrate, nitrite, chlorine dioxide, turbidity, CT corrective measures, and Giardia) | 60 |
| 2. Correction of nonacute MCL violation (IOCs excluding acute contaminants, radionuclides, SOCs, VOCs) | 50 |
| 3. Correction of an expected MCL or treatment technique violation (acute or nonacute) | 45 |
| 4. Correction of Tier II treatment technique violation as defined in 567—paragraph 42.1(3)“a” (Pb/Cu corrective measures, disinfection byproduct precursor removal) | 40 |
| 5. Mitigation of an imminent threat from groundwater contamination (from UST site, from CERCLA site, from uncontrolled site) | 35 |
| 6. Connection of individual residences to PWS to eliminate use of contaminated individual private wells (bacterial, nitrate, radionuclide, or IOC/VOC/SOC well contamination all eligible) | 35 |
| 7. Replacement of asbestos cement pipe (replace at least 200 feet of pipe) | 15 |
| B. Infrastructure and Engineering-related Improvement Criteria (maximum of 35 points) | |
| 1. Development of system redundancy and additional source to meet peak day demand with largest well or intake out of service; plant process rehabilitation (made to ensure redundancy of treatment units to protect against acute or chronic MCL with system's largest treatment unit out of service); water storage improvements (system reliability enhancement—to increase effective storage to Average Daily Demand, including either at-ground or elevated storage); pumping improvements meeting hydraulic and Ten-State Standard requirements for Average Daily Demand. | 35 |
| 2. Water systems over capacity expansion. Points are allowable only when system is operating at 85% or more of system design capacity. Source, plant, or distribution system improvements for system expansion are all eligible under this category. | 30 |
| 3. Pressure and other distribution system improvements, including pump upgrades, pipe looping, valves, fittings, line replacement, hydrants, pumping stations, and water meters | 20 |
| 4. Treatment plant improvements, excluding operation and maintenance costs | 15 |
| 5. Provision of emergency power/emergency pumping capacity including purchase of diesel generators or installation of automatic switching systems | 15 |

| Scoring Criterion | Points |
|---|--------|
| 6. Security improvements (fencing, lighting, video surveillance, locks, access control) | 10 |
| C. Affordability Criteria (maximum of 10 points) | |
| 1. System serves low-income population (Community Development Block Grant (CDBG) Iowa Department of Economic Development (IDED) Low-Moderate Income Criteria (LMI)) | 10 |
| D. Special Category Improvements (maximum of 15 points) | |
| 1. Wellhead or source water protection plan development or implementation meeting department standards, including loans for land or easement acquisition | 15 |
| 2. Water conservation measures/conservation plan preparation, adoption, and enforcement | 5 |
| E. IDNR Adjustment Factor for Population | |
| 1. (Project Serves) Population less than 10,000 | 10 |
| TOTAL MAXIMUM POINTS | 130 |

567—44.8(455B) Intended use plan.

44.8(1) Development. The director shall prepare an intended use plan (IUP) at least annually and on a quarterly basis as needed. The IUP will be submitted to a public hearing and approved by the commission and U.S. EPA.

44.8(2) Contents. The IUP will identify the anticipated uses of loan funds and will include:

a. The state project priority list (defined in rule 567—44.7(455B)) which includes all projects that are eligible for DWSRF loans and any proposed activities eligible for assistance under set-aside authority of the SDWA. The list will include the name of the eligible recipient, applicable PWS permit number, the projected amount of loan assistance, and a schedule of estimated disbursement of funds. The department will consider the following in developing the list of eligible recipients for the intended use plan:

(1) Whether a project will be ready to proceed on a schedule consistent with time requirements for outlay of funds; and

(2) Whether the project addresses the need upon which the system's priority is based.

b. Discussion of the long-term and the short-term goals of the DWSRF.

c. Information on the types of activities to be supported by the DWSRF, including requests for planning and design loans.

d. The method by which the IUP may be amended.

e. Assurances on how the state intends to meet environmental review requirements of the SDWA.

567—44.9(455B) Department initial approval of projects.

44.9(1) Project initiation conference. The department may require the applicant or the applicant's representative to meet at a location designated by the department.

44.9(2) Required project information. An applicant seeking financial assistance from the DWSRF for a construction project must provide the following information to the director for review and approval:

a. Plans and specifications must be signed by a professional engineer holding current license to practice in Iowa.

b. Plans and specifications must be consistent with the project identified in the application submitted pursuant to subrule 44.7(5).

c. The planned project must be described in full, and the construction requirements necessary to complete the project as proposed must be detailed.

d. The project submittal shall include the latest engineering cost estimate for the project.

e. The plans and specifications shall comply with all applicable state statutes, rules, and design standards.

f. Those portions of projects not meeting eligibility requirements may be excluded from the funded project, but included in the submitted plans and specifications if the applicant chooses to keep the loan-ineligible part of the project as part of the overall system improvement. Ineligible portions of

projects include but are not limited to dams, water rights, monitoring costs, operation and maintenance expenses, projects designed primarily in anticipation of speculative growth, and projects needed primarily for fire protection.

g. The applicant has demonstrated its ability to provide the necessary legal, institutional, managerial, and financial capability to complete the project.

44.9(3) Department review. An applicant seeking financial assistance from the DWSRF for any project appearing on the project priority list must submit information as required under subrule 44.7(5) on forms provided by and acceptable to the department. Departmental review requirements shall consist of the following:

a. Upon review and approval of construction projects submitted as required under subrule 44.7(5), and the plans and specifications as required under subrule 44.9(2), and following a determination that the project meets the applicable requirements of the SDWA, federal regulations, Iowa statutes, and relevant portions of this chapter, the director shall approve the project in writing.

b. If there is an alteration (change order) to a project after the director approves the project, the eligible applicant must request in writing from the department an amended approval. The director shall review the request and proposed project alteration (change order) and, upon a determination that the project meets the applicable requirements of the SDWA, federal regulations, the August 7, 2000, Drinking Water State Revolving Funds: Interim Final Rule (40 CFR Part 35, Subpart L), program guidance, Iowa statutes, and relevant portions of this chapter, the director shall approve the project as amended.

c. If the project is not approved, the director shall notify the applicant in writing of the reason for disapproval.

567—44.10(455B) General administrative requirements.

44.10(1) Allowable costs. Allowable costs shall be limited to those costs deemed necessary, reasonable, and directly related to the efficient completion of the project. The director will determine project costs eligible for state assistance in accordance with rule 567—44.6(455B). Land purchase, easement, or rights-of-way costs are ineligible with the exception of land which is integral to a project needed to meet or maintain public health protection and which is needed to locate eligible treatment or distribution works. Source water protection easements are considered to be integral to a project. (The acquisition of land or easements has to be from a willing seller.) In addition to those costs identified in this chapter, unallowable costs include the following:

a. Costs of service lines, except lead-containing service lines and connectors which are exterior to a home.

b. Costs of in-house plumbing.

c. Administrative costs of the loan recipient.

d. Vehicles and tools.

44.10(2) Audits. The recipient shall provide access at all times for the department, the authority, the state auditor and the Office of the Inspector General (OIG) at EPA to all project records and documents for inspection and audit purposes for a period of three years from the date of the final loan payment. The same access to the project site(s) shall be provided for inspection purposes.

44.10(3) Cross-cutters. Other federal and state statutes and programs, including federal “cross-cutters,” will be applicable to DWSRF projects.

44.10(4) Additional loan amount. If eligible costs exceed the loan amount, the recipient may request an increase. The director in coordination with the authority will evaluate the request by considering available money in the fund as well as compliance with other state and federal requirements.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—44.11 Reserved.

567—44.12(455B) Construction phase and postconstruction phase requirements.

44.12(1) *Estimated project completion date.* The loan recipient must notify the director of the estimated project completion date. A final inspection of the project may be performed by the director to verify that construction is complete (except for weather-related items) and conforms with the approved plans and specifications and all approved change orders.

44.12(2) *Adequate project performance.* The department shall undertake measures to discern adequate project performance as follows:

a. Three months after initiation of operation of the project, the loan recipient must certify to the director that the project is operating as planned and designed. This certification must be made on a form provided by and approved by the department.

b. If the loan recipient is unable to certify that the project is operating as planned and designed, the recipient must submit a corrective action report to the director for review and approval. An acceptable corrective action report must contain an analysis of the project's failure to operate as designed; a discussion of the nature, scope, and cost of the action needed to correct the failure; and a schedule for completing the corrective work.

567—44.13(455B) Sanctions. Failure of a project to conform to approved plans and specifications or failure of a loan recipient to comply with the requirements of 567—Chapter 40 through 567—Chapter 44 pertaining to drinking water supply systems constitutes grounds for the withholding of loan disbursements. The loan recipient is then responsible for ensuring that the identified problem either in the plans and specifications or in the other relevant portion of the project is rectified such that disbursements may be resumed. Once an agreement for correcting the conditions which led to the withholding of funds is reached between the department and the loan recipient, the retained funds shall be released according to the provisions of the agreement.

567—44.14(455B) Disputes. A person or entity that disagrees with the project rankings, department decisions, or the withholding of project funding pursuant to rule 567—44.7(455B), 567—44.8(455B), or 567—44.13(455B) may request a formal review of the action. The person or entity must submit to the director a request for review in writing within 45 days of the date of notification of the final decision made by the department or department staff. A decision by the director in a formal review case may be further appealed to the commission.

These rules are intended to implement Iowa Code sections 455B.291 to 455B.299.

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CHAPTER 81
OPERATOR CERTIFICATION: PUBLIC WATER SUPPLY SYSTEMS
AND WASTEWATER TREATMENT SYSTEMS

[Prior to 7/1/83, DEQ Ch 21]

[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—81.1(455B) Definitions. In addition to the definitions in Iowa Code section 455B.211, the following definitions shall apply to this chapter.

“Activated sludge” means a biological wastewater treatment process in which a mixture of wastewater and sludge floc, produced in a raw or settled wastewater by the growth of microorganisms, is agitated and aerated in the presence of a sufficient concentration of dissolved oxygen, followed by sedimentation.

“Aerated lagoon system” means a lagoon system which utilizes aeration to enhance oxygen transfer and mixing in the cell.

“Aeration” means the process of initiating contact between air and water. This definition includes but is not limited to: spraying the water in the air, bubbling air through the water, or forcing the air into the water by pressure.

“Average daily pumpage” means the total quantity of water pumped during the most recent one-year period of record divided by 365 days.

“Chlorination” means the addition of a chlorine compound or chlorine gas to water to inactivate pathogenic organisms.

“Classification” means the type of plant or distribution system: wastewater treatment plants, water treatment plants, or water distribution systems.

“Coagulation” means a process using coagulation chemicals and mixing by which colloidal and suspended materials are destabilized and agglomerated into flocs.

“Community water system (CWS)” means a public water supply system which has at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

“Continuing education unit (CEU)” means ten contact hours of participation in an organized education experience approved by an accredited college, university, technical institute, or issuing agency, or by the department, and must be directly related to the subject matter of the particular certificate to which the credit is being applied.

“Directly related post-high school education” means post-high school education in chemistry, microbiology, biology, math, engineering, water, wastewater, or other curriculum pertaining to plant and distribution system operation.

“Director” means the director of the department of natural resources or a designee.

“Direct responsible charge (DRC)” means, where shift operation is not required, accountability for and performance of active, daily on-site operation of the plant or distribution system, or of a major segment of the plant or distribution system. Where shift operation is required, “direct responsible charge” means accountability for and performance of active, daily on-site operation of an operating shift, or a major segment of the plant or distribution system. A city manager, superintendent of public works, city clerk, council member, business manager, or other administrative official shall not be deemed to have direct responsible charge of a plant or distribution system unless this person’s duties include the active, daily on-site operation of the plant or distribution system. On-site operation may not necessarily mean full-time attendance at the plant or distribution system.

“Direct surface water filtration” means a water treatment system that applies surface water and groundwater under the influence (influenced groundwater as defined in rule 567—40.2(455B)) directly to the filters after chemical treatment consisting of coagulation and flocculation or chemical treatment consisting of coagulation. This type of system eliminates the sedimentation unit process.

“Disinfection” means a process which inactivates pathogenic organisms in water by chemical oxidants or equivalent agents.

“Electrodialysis” means the demineralization of water by the removal of ions through special membranes under the influence of a direct-current electric field.

“Fixed film biological treatment” means a treatment process in which wastewater is passed over a media onto which are attached biological organisms capable of oxidizing the organic matter, normally followed by sedimentation. This definition includes but is not limited to: trickling filters, rotating biological contactors, packed towers and activated filters.

“Fluoridation” means the addition of fluoride to produce the optimum fluoride concentration in water.

“Grade” means one of seven certification levels, designated as A, I, IL, II, IIL, III, or IV.

“Ion exchange” means the process of using ion exchange materials such as resin or zeolites to remove undesirable ions from water and substituting acceptable ions, for example, ion exchange for nitrate removal or ion exchange for softening.

“Issuing agency” means a professional, technical/educational organization authorized by the department to provide continuing education for certification renewal or upgrade in accordance with the commitments and guidelines detailed in the written issuing agency agreement and procedures.

“Military service” means honorably serving on federal active duty, state active duty, or national guard duty, as defined in Iowa Code section 29A.1; in the military services of other states, as provided in 10 U.S.C. Section 101(c); or in the organized reserves of the United States, as provided in 10 U.S.C. Section 10101.

“Military service applicant” means an individual requesting credit toward certification for military education, training, or service obtained or completed in military service.

“Nontransient noncommunity water system (NTNC)” means a public water system other than a community water system which regularly serves at least 25 of the same persons four hours or more per day for four or more days per week for 26 or more weeks per year.

“Operating shift” means a specified period of time when an operator is present to conduct testing or evaluation to control operations of the plant or distribution system, to make process control changes, and to be responsible for the repair or maintenance of a plant or distribution system. An operating shift may include on-call shifts.

“Operator-in-charge” means a person or persons on site in direct responsible charge for a plant or distribution system. A city manager, superintendent of public works, city clerk, council member, business manager, or other administrative official shall not be deemed to be the operator-in-charge of a plant or distribution system unless this person’s duties include the active, daily on-site operation of the plant or distribution system. On-site operation may not necessarily mean full-time attendance at the plant or distribution system.

“Plant” means those facilities which are identified as either a water treatment plant, defined as that portion of the water supply system which in some way alters the physical, chemical, or bacteriological quality of the water, or a wastewater treatment plant, defined as the facility or group of units used for the treatment of wastewater from public sewer systems and for the reduction and handling of solids removed from such wastes.

“Population equivalent” for a wastewater treatment plant means the calculated number of people who would contribute the same biochemical oxygen demand (BOD) per day as the system in question, assuming that each person contributes 0.167 pounds of five-day, 20°C, BOD per day.

“Post-high school education” means credit received for completion of courses given or cosponsored by an accredited college, university, technical institute, or issuing agency. Courses offered by regulatory agencies may also be recognized as post-high school education. One year of post-high school education is 30 semester hours or 45 quarter hours or 45 CEUs of credit.

“Primary treatment” means a treatment process designed to remove organic and inorganic settleable solids from wastewater by the physical process of sedimentation.

“Public water system certificate” means a certificate issued by the department certifying that an operator has successfully completed the certification requirements of this chapter. The certificate specifies the grades and classifications for which the certificate is valid.

“Reverse osmosis” means the process in which external pressure is applied to mineralized water against a semipermeable membrane to effectively reduce total dissolved solids (TDS) and radionuclides content as the water is forced through the membrane.

“*Rural water district*” means a water supply incorporated and organized as such pursuant to Iowa Code chapter 357, 357A or 358.

“*Shift operator*” means the operator on site who has responsibility for making process control changes and adjustments to the operation, repair, and maintenance of a plant or distribution system during any operating shift. Duties include testing or evaluation to control operations of the plant or distribution system.

“*Stabilization*” means the addition of chemical compounds to water to maintain an ionic equilibrium whereby the water is not in a depository or corrosive state.

“*Veteran*” means an individual who meets the definition of “veteran” in Iowa Code section 35.1(2).

“*Waste stabilization lagoon*” means an excavation designed and constructed to receive raw or pretreated wastewater in which stabilization is accomplished by several natural self-purification processes. This definition includes both anaerobic and aerobic lagoons.

“*Wastewater treatment plant*” means the facility or group of units used for the treatment of wastewater from public sewer systems and for the reduction and handling of solids removed from such wastes.

“*Water distribution system*” means that portion of the water supply system in which water is conveyed from the water treatment plant or other supply point to the premises of the consumer, including storage facilities and pumping stations. For the purposes of this chapter, a water distribution system does not include individual service lines to the premises of the consumer, which are not under the control of the system.

“*Water supply system*” means the system of pipes, structures, and facilities through which water for a public water supply is obtained, treated, sold or distributed for human consumption or household use.

“*Water treatment plant*” means that portion of the water supply system which in some way alters the physical, chemical, or microbiological quality of the water.

[ARC 1911C, IAB 3/18/15, effective 4/22/15; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—81.2(455B) General.

81.2(1) *Plant grade for system with multiple treatment processes.* A plant having a combination of treatment processes that are in different grades shall be assigned the highest numerical plant grade of that combination.

81.2(2) *Increase in facility grade for complex systems.* The director may increase a plant or water distribution system grade above that indicated in rules 567—81.3(455B) to 567—81.6(455B) for those systems which in the judgment of the director include unusually complex treatment processes, complex distribution systems, or which present unusual operation or maintenance conditions.

81.2(3) *Operator-in-charge certification requirement.* The operator-in-charge shall hold a certificate of the same classification of the plant or water distribution system and of equal or higher grade than the grade designated for that plant or distribution system.

81.2(4) *Shift operator certification.* Any person who is responsible for the operation of an operating shift of a plant or distribution system or major segment of the plant or distribution system and is under the supervision of the operator-in-charge identified in 81.2(3) shall be certified in a grade no less than a Grade II level for Grade III and IV plants and distribution systems and Grade I for Grade I and II plants and distribution systems.

81.2(5) *Public water system certificate requirement.* The operator who is designated by the owner to be the operator-in-charge of both the water treatment plant and the water distribution system shall hold a public water system (PWS) certificate valid for water treatment and water distribution in accordance with 81.2(3) and 81.2(6).

81.2(6) *PWS certificate.* A PWS certificate shall be issued to an operator successfully completing water treatment or water distribution certification. The PWS certificate shall specify the grade and classification for which the certificate is valid. An operator successfully completing both water treatment and water distribution certification shall be issued a PWS certificate valid for both classifications. For purposes of renewal, all renewal fees and CEU requirements shall be applied as one certification. The

number of CEUs required shall be determined by the highest certification grade on the operator's public water system certificate.

81.2(7) PWS certificate issuance. Rescinded IAB 1/7/04, effective 2/11/04.

81.2(8) Notification requirements for a personnel change in the operator-in-charge. The owner of a plant or distribution system must notify the department of a change in operator(s)-in-charge within 30 days after the change.

81.2(9) Change of address or employment. Certified operators must report to the department a change in address or employment within 30 days after the change.

81.2(10) Owner reporting requirements. All owners of plants and distribution systems must report, when requested by the department, the method of treatment provided, the average daily pumpage, and the operator(s)-in-charge.

81.2(11) Compliance plan. When the director allows the owner of a plant or distribution system required to have a certified operator time to obtain an operator, the owner must submit a compliance plan indicating what action will be taken to obtain a certified operator. The plan must be on Form 52, Compliance Plan 542-3120, provided by the department and must be submitted within 30 days of the facility owner's receipt of a notice of violation.

567—81.3(455B) Wastewater treatment plant grades.

81.3(1) Classifications. The wastewater treatment plant classifications are listed in the following table:

Wastewater Treatment Plant Classifications

| Treatment Type | Grade | | | | |
|------------------------------------|---|-------------|------------------|-------------------|---------------------|
| | Based on Design Pounds of BOD ₅ /day | | | | |
| | less than 334 | 334-835 | 836-2,505 | 2,506-8,350 | more than 8,350 |
| | Based on Design Population Equivalent | | | | |
| | less than 2,000 | 2,000-5,000 | 5,001- 15,000 | 15,001- 50,000 | more than 50,000 |
| 1. Primary Treatment | I | I | II | III | IV |
| 2. Waste Stabilization Lagoon | IL | IL | IL | IL | IL |
| 3. Aerated Lagoon System | IL | IL | III | III | III |
| 4. Fixed Film Biological Treatment | II | II | III | III | IV |
| 5. Activated Sludge | II | III | III | IV | IV |

81.3(2) Unknown design BOD₅ loading. When the design BOD₅ loading is unknown, the plant BOD₅ loading shall be determined by using the average pounds of BOD₅ of the 24-hour composite samples taken in the last 12 months. If no 24-hour composite samples were taken, then grab samples shall be used.

81.3(3) IL and IIL wastewater operator requirements. A Grade I, II, III, or IV wastewater treatment certificate will satisfy the certification requirements for a Grade IL plant. A Grade II, III, or IV wastewater treatment certificate will satisfy the certification requirements for a Grade IIL plant.

567—81.4(455B) Water treatment plant grades.

81.4(1) Classifications. The water treatment plant classifications are listed in the following table:

Water Treatment Plant Classifications

| Treatment Type | Grade* | | | |
|---|------------------------------|----------|----------|------|
| | Average Daily Pumpage in MGD | | | |
| | 0-0.1 | >0.1-0.5 | >0.5-1.5 | >1.5 |
| 1. Iron or manganese removal; aeration; chlorination; fluoridation; stabilization; any other chemical addition; or any combination of these processes | I | II | II | III |
| 2. Ion exchange | II | II | III | III |
| 3. Direct surface water filtration | II | II | III | III |
| 4. Utilization of lime, soda ash or other chemical addition for pH adjustment in the precipitation and coagulation of iron or manganese | II | II | III | III |
| 5. Complete surface water clarification or lime softening of surface water or groundwater | III | III | III | IV |
| 6. Reverse osmosis and electro dialysis | II | II | III | IV |
| 7. Activated carbon for THM or synthetic organics removal | III | III | III | IV |

*For Grade A water supply classification, see subrule 81.6(1).

81.4(2) Average daily pumpage. When the average daily pumpage is unknown, the plant grade will be determined from the population of the most recent census and an evaluation of commercial, industrial, and other users.

567—81.5(455B) Water distribution system grades.

81.5(1) Classifications. The water distribution plant classifications are listed in the following table:

Water Distribution System Classifications*

| System Type | Grade** | | | |
|--|------------------------------|------------|--------------|--------|
| | Average Daily Pumpage in MGD | | | |
| | 0-0.1 | >0.1-1.5 | >1.5-5 | >5 |
| All municipal water systems | I | II | III | IV |
| Community water systems not classified as a Grade A water system | I | II | III | IV |
| Nontransient noncommunity water systems not classified as a Grade A water system | I | II | III | IV |
| Rural water districts | Miles of Pipe | | | |
| | 0-100 | >100-1,000 | >1,000-2,500 | >2,500 |
| | II | II | III | IV |

*Note: A public water system with a well, storage, and a distribution system shall be classified as a water distribution system if no treatment is provided.

**For Grade A water system classification, see subrule 81.6(1).

81.5(2) Average daily pumpage. When the average daily pumpage is unknown, the system grade will be determined from the population of the most recent census and an evaluation of commercial, industrial, and other users.

81.5(3) IR certificate holders. Rescinded IAB 1/7/04, effective 2/11/04.

567—81.6(455B) Grade A classification.

81.6(1) Grade A water system classification.

a. *Community water system.* A community water system, other than a municipal or rural water system, which serves a population of 250 persons or less and provides no treatment other than

hypochlorination or treatment which does not require any chemical addition, process adjustment, backwashing or media regeneration by an operator shall be classified as a Grade A water system.

b. Nontransient noncommunity water system. A nontransient noncommunity water system which serves a population of 500 persons or less and provides no treatment other than hypochlorination or treatment which does not require any chemical addition, process adjustment, backwashing or media regeneration by an operator shall be classified as a Grade A water system.

c. Transient noncommunity water system. A transient noncommunity water system which serves a population of 500 or fewer persons and provides no treatment other than hypochlorination or treatment which does not require any chemical addition, process adjustment, backwashing or media regeneration by an operator shall be classified as a Grade A water system.

81.6(2) Certification requirements for Grade A water systems. Any grade of water treatment certification will satisfy the certification requirements for a Grade A water system with hypochlorination. Any grade of water distribution certification will satisfy the certification requirements for a Grade A water system without hypochlorination.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—81.7(455B) Operator education and experience qualifications.

81.7(1) Education and experience requirements. All applicants shall meet the education and experience requirements for the grade of certificate shown in the table below prior to being allowed to take the examination. Experience shall be in the same classification for which the applicant is applying except that partial credit may be given in accordance with 81.7(2) and 81.7(3). Directly related post-high school education shall be in the same subject matter as the classification in which the applicant is applying. The director will determine which courses qualify as “directly related” in cases which are not clearly defined. A military service applicant may apply for credit for verified military education, training, or service toward any education or experience requirement for certification, pursuant to subrule 81.7(4).

Operator Education and Experience Qualifications

| Grade | Education | Substitution for Education | Experience | Substitution for Experience |
|-------|---|----------------------------|---|---|
| A | High school diploma or GED | None | Completion of an IDNR-approved training course | None |
| I | High school diploma or GED | None | 1 year | See 81.7(3) “b”(1), (3) to (5) |
| II | High school diploma or GED | None | 1 year | See 81.7(3) “b”(1), (3) to (5) |
| II | High school diploma or GED | None | 3 years | See 81.7(3) “b”(2) to (5) |
| III | High school diploma or GED | None | 3 years | See 81.7(3) “b”(2) to (5) |
| III | High school diploma or GED and 2 years of post-high school education (1 year must be directly related) | See 81.7(3) “a”(1), (3) | 4 years of experience in a Grade I or higher | See 81.7(3) “b”(2), (3) |
| IV | High school diploma or GED and 4 years of post-high school education (2 years must be directly related) | See 81.7(3) “a”(2), (3) | 4 years of experience including 2 years of DRC in a Grade III or higher | See 81.7(3) “b”(2), (3) and 81.7(3) “c” |

81.7(2) Related work experience. The following substitutions of related work experience for operating experience requirements may be accepted by the director.

a. Laboratory personnel. Laboratory personnel employed in water or wastewater treatment plants may be allowed 50 percent credit for work experience toward meeting the operating experience requirements for Grades I and II certification only. Laboratory experience must be in the same classification for which the applicant is applying.

b. Oversight personnel. Personnel with experience in on-site operation review and evaluation of plants and distribution systems may be allowed 50 percent credit for on-site work experience toward meeting the operating experience requirements for Grades I and II certification only. On-site experience must be in the same classification for which the applicant is applying.

c. Maintenance personnel. Maintenance personnel employed in water or wastewater treatment plants may be allowed 50 percent credit for work experience toward meeting the operating experience requirements for Grades I and II certification only. Maintenance experience may be applied either to the water or to the wastewater experience requirements.

d. Certified operators.

(1) Certified water treatment operators may be allowed 50 percent credit for work experience toward meeting the operating experience requirements for Grades I and II wastewater treatment certification only.

(2) Certified wastewater treatment operators may be allowed 50 percent credit for work experience toward meeting the operating experience requirements for Grades I and II water treatment certification only.

(3) Certified water treatment operators may be allowed 50 percent credit for work experience toward meeting the operating experience requirements for Grades I and II water distribution certification only.

(4) Certified water distribution operators may be allowed 50 percent credit for work experience toward meeting the operating experience requirements for Grades I and II water treatment certification only.

e. Limitation. The portion of related work experience that is substituted for operating experience cannot also be used to substitute for education.

81.7(3) Experience and education substitutions. The following substitutions for experience or education may be accepted by the director.

a. Substitution of experience for education.

(1) One year of operating experience in a Grade II or higher position may be substituted for one year of post-high school education for Grade III certification up to one-half of the post-high school education requirement.

(2) One year of operating experience in a Grade III or higher position may be substituted for one year of post-high school education for Grade IV certification up to one-half of the post-high school education requirement.

(3) Two years of direct responsible charge experience in a Grade III or higher position may be substituted for one year of directly related post-high school education for Grade IV certification up to three-fourths of the post-high school education requirement.

(4) That portion of experience which is applied toward substitution for education cannot also be used for experience.

b. Substitutions of education for experience.

(1) Two semester hours or three quarter hours or three CEUs of directly related post-high school education may be substituted for one-half the experience requirement for Grades I and II.

(2) Thirty semester hours or 45 quarter hours or 45 CEUs of post-high school education may be substituted for one year of experience up to a maximum of one-half the experience requirement for Grades II, III, III and IV.

(3) That portion of education which is applied toward substitution for experience cannot also be used for education.

(4) Class hours involving closely supervised on-the-job type training in a pilot or full-scale facility where there are clearly defined educational objectives may be applied to the on-the-job experience requirement. The substitution value of such training shall be applicable only toward obtaining a Grade I and Grade II certification and shall not exceed one-half year of on-the-job experience. One hour of on-the-job training is equivalent to three hours of on-the-job experience. One month of on-the-job training consists of 20 eight-hour days. Credit for on-the-job training may be applied only to the examination for the type of system in which the experience was obtained.

(5) That portion of on-the-job training courses which is applied toward substitution for the on-the-job experience requirement cannot also be used for education.

c. Substitution of education for direct responsible charge experience. Thirty semester hours or 45 quarter hours or 45 CEUs of directly related post-high school education may be substituted for one year of direct responsible charge experience up to one-half the requirement for Grade IV certification.

81.7(4) Military education, training, and service credit.

a. The applicant shall identify the experience or education certification requirements for which the credit is requested.

b. As part of the examination application pursuant to subrule 81.9(1), the applicant shall provide documents, military transcripts, a certified affidavit, or forms that verify completion of the relevant military education, training, or service, which may include, when applicable, the applicant's Certificate of Release or Discharge from Active Duty (DD Form 214) or Verification of Military Experience and Training (VMET) (DD Form 2586).

[ARC 1911C, IAB 3/18/15, effective 4/22/15; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—81.8(455B) Certification and examination fees.

81.8(1) Examination fee. The examination fee for each examination shall be \$30.

81.8(2) Oral examination fee. Rescinded IAB 4/11/18, effective 5/16/18.

81.8(3) Reciprocity application fee. The reciprocity application fee for each type of classification shall be \$30.

81.8(4) Certification fee. The certification fee shall be \$20 for each one-half year of a two-year period from the date of issuance to June 30 of odd-numbered years.

81.8(5) Renewal fee. The certification renewal fee shall be \$60.

81.8(6) Penalty fee. The certification and renewal penalty fee shall be \$18.

81.8(7) Duplicate certificate fee. The duplicate certificate fee shall be \$20.

81.8(8) Temporary certificate fee. The temporary certificate fee shall be \$60.

81.8(9) Fee adjustments. The department may adjust the fees annually by up to plus or minus 20 percent to cover costs of administering and enforcing these rules and reimbursement for other expenses relating to operator certification. The environmental protection commission must approve any fee increases above those listed in 81.8(1) through 81.8(8). All fees collected shall be retained by the department for administration of the operator certification program.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—81.9(455B) Examinations.

81.9(1) Examination application. All persons wishing to take the examination required to become a certified operator of a wastewater or water treatment plant or a water distribution system shall complete the Operator Certification Examination Application, Form CFN-542-3118/CPG-63997. A listing of dates and locations of examinations is available from the department upon request. The application form requires the applicant to indicate educational background, training and past experience in water or wastewater operation. The completed application and examination fee shall be sent to Iowa Department of Natural Resources, Water Supply Section, 502 East Ninth Street, Des Moines, Iowa 50319-0034. The completed application and examination fee must be received by the department at least 30 days prior to the date of examination.

81.9(2) Application evaluation. The director shall designate department personnel to evaluate all applications for examination, certification, and renewal of certification and upgrading of certification. After evaluation of the application, the department will issue the applicant either a letter of examination

eligibility or a letter of examination noneligibility that includes a description of the education or experience requirements that have not been met. The director will review applications when it is indicated that the applicant has falsified information or when questions arise concerning an applicant's qualifications of eligibility for examination or certification.

81.9(3) *Application expiration.* A properly completed application for examination shall be valid for one year from the date the application is approved by the department. An applicant may request only one class and grade of examination with each application. A new application shall be required with each different class or grade of examination desired by the applicant.

81.9(4) *Refund of examination fee.* An applicant who does not qualify for examination at the time of application will have the examination fee refunded if the applicant cannot qualify for examination within one year. If the applicant will qualify for a scheduled examination within one year, the applicant will be notified when the examination may be taken and the fee will not be refunded.

81.9(5) *Reexamination.* Upon failure of the first examination, the applicant may apply for reexamination. Upon failure of the second examination, the applicant shall be required to wait a period of at least 30 days between each subsequent examination.

81.9(6) *Reexamination fee.* Upon each reexamination when a valid application is on file, the applicant shall submit the examination fee to the department at least ten days prior to the date of examination.

81.9(7) *Application invalidation.* Failure to successfully complete the examination within one year from the date of approval of the application shall invalidate the application.

81.9(8) *Retention of completed examinations.* Rescinded IAB 1/7/04, effective 2/11/04.

81.9(9) *Oral examination.* Rescinded IAB 4/11/18, effective 5/16/18.

81.9(10) *Reasonable accommodation.* Upon request for certification by an applicant, the director will consider on an individual basis reasonable accommodation to allow administration of the examination without discrimination on the basis of disability. The applicant shall request the accommodation 30 days prior to the date of the examination. The applicant must provide documentation of eligibility for the accommodation. Documentation shall be submitted with the completed examination application.

[ARC 1911C, IAB 3/18/15, effective 4/22/15; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—81.10(455B) Certification by examination.

81.10(1) *Examination requirement.* All applicants not addressed for certification in 81.11(1) shall successfully complete and pass an examination prior to receiving certification.

81.10(2) *Certification application time line.* Application for certification must be received by the department within 30 days of the date the applicant receives notification of successful completion of the examination. All applications for certification shall be made on a form provided by the department and shall be accompanied by the certification fee.

81.10(3) *Late certification application.* Applications for certification by examination which are received more than 30 days but less than 60 days after notification of successful completion of the examination shall be accompanied by the certification fee and the penalty fee. Applicants who do not apply for certification within 60 days' notice of successful completion of the examination will not be certified on the basis of that examination.

567—81.11(455B) Certification by reciprocity.

81.11(1) *Other states' mandatory certification programs.* For applicants who have been certified under other states' mandatory certification programs, the equivalency of which has been previously reviewed and accepted by the department, certification in an appropriate classification and grade, without examination, will be recommended. The applicant must have successfully completed an examination generally equivalent to the Iowa examination and must meet the education and experience qualifications established by the director.

81.11(2) *Other states' voluntary certification programs.* For applicants who have been certified under voluntary certification programs in other states, certification in an appropriate class will be

considered. The applicant must have successfully completed an examination generally equivalent to the Iowa examination and must meet the education and experience qualifications established by the director. The director may require the applicant to successfully complete the Iowa examination.

81.11(3) Reciprocity application.

a. All applicants. Applicants who seek Iowa certification pursuant to subrule 81.11(1) or 81.11(2) shall submit an Operator Certification Reciprocity Application accompanied by a letter requesting certification pursuant to these subrules. Application for certification pursuant to 81.11(1) and 81.11(2) shall be received by the director in accordance with these subrules. The applicant shall be certified at the appropriate grade pursuant to subrule 81.7(1).

b. Veteran applicants. An applicant who is a veteran shall submit an Operator Certification Reciprocity Application pursuant to paragraph 81.11(3) “a” and shall also provide such documentation as is needed to verify the applicant’s status as a veteran under Iowa Code section 35.1(2). The veteran’s application shall be given priority and shall be expedited.

81.11(4) Certification obtained through reciprocity. An applicant who obtains certification in Iowa through reciprocity and subsequently allows the certification to lapse will be required to reapply for certification in accordance with 567—81.10(455B).

[ARC 1911C, IAB 3/18/15, effective 4/22/15]

567—81.12(455B) Restricted certification. Upon written request by an operator, the director may determine that further education requirements be waived when a plant or distribution system grade has been increased and the operator has been in direct responsible charge of the existing plant or distribution system. An operator successfully completing the examination will be restricted to that plant or distribution system until the education requirements are met.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—81.13(455B) Certification renewal.

81.13(1) Renewal period. All certificates shall expire on June 30 of odd-numbered years and must be renewed every two years in order to maintain certification.

81.13(2) Application for renewal. An application for renewal will be mailed to currently certified operators prior to the expiration date of their certificates. Application for renewal must be made in accordance with this rule and the instructions on the form in order to renew the certificate for the next two years. Application for renewal of a certificate without penalty must be received by the director or postmarked prior to the expiration of the certificate, and shall be accompanied by the certification renewal fee.

81.13(3) Late application. A late application for renewal of a certificate may be made provided that the application is received by the director or postmarked within 60 days of the expiration of the certificate on forms provided by the department. Such late application shall be accompanied by the penalty fee and the certification renewal fee.

81.13(4) Failure to renew. If a certificate holder fails to renew within 60 days following expiration of the certificate, the right to renew the certificate is automatically terminated. Certification may be allowed at any time following such termination, provided that the applicant meets all education and experience eligibility requirements pursuant to 567—81.7(455B), and successfully completes an examination. The applicant must then apply for certification in accordance with 567—81.10(455B).

81.13(5) Expired certificate. An operator may not continue as the operator-in-charge of a plant, distribution system, operating shift, or major segment of the plant or distribution system after expiration of a certificate unless the certificate is renewed.

567—81.14(455B,272C) Continuing education.

81.14(1) CEU requirements. Continuing education must be earned during two-year periods between April 1 and March 31 of odd-numbered years. A Grade III or IV certified operator must earn two units or 20 contact hours per certificate during each two-year period. All other certified operators must earn one unit or 10 contact hours per certificate during each two-year period. Newly certified operators (previously uncertified) who become certified after April 1 of a two-year period will not be required to earn CEUs

until the next two-year period. If an operator upgrades a certificate after April 1 of a two-year period and that upgrade increases the CEU requirement, the operator will not be required to meet the higher CEU requirement until the next two-year period but must fulfill the lower CEU requirement for that period. For those certified operators holding both a water treatment and a water distribution certification, no less than 25 percent of the required CEUs may be earned in any one area.

81.14(2) *Certificate renewal.* Only those operators fulfilling the continuing education requirements before the end of each two-year period (March 31) will be allowed to renew their certificate(s). The certificate(s) of operators not fulfilling the continuing education requirements shall expire on June 30 of each odd-numbered year.

81.14(3) *CEU approval.* All activities for which continuing education credit will be granted must be approved by an accredited college, university, technical institute, or issuing agency, or by the department, and must be directly related to the subject matter of the particular certificate to which the credit is being applied. Any entity holding courses in Iowa for which continuing education credit is offered for water treatment, water distribution, or wastewater operator certification must provide at no cost to the department the opportunity for one staff member to audit the training and receive all training materials.

81.14(4) *CEU extensions.* The director may, in individual cases involving hardship or extenuating circumstances, grant an extension of up to three months within which the certified operator may fulfill the minimum continuing education requirements. Hardship or extenuating circumstances include documented health-related confinement or other circumstances beyond the control of the certified operator which prevent attendance at the required activities. All requests for extensions must be made prior to March 31 of each biennium.

81.14(5) *CEU reporting.* It is the certified operator's personal responsibility to maintain a written record and to notify the department of the continuing education credit earned during the period. The continuing education credits earned during the period shall be listed on the application for renewal.

567—81.15(455B) *Upgrading of certificates.* A person holding an unexpired certificate may upgrade the certificate by examination to a higher grade in the same classification in accordance with 567—81.7(455B), 567—81.9(455B) and 567—81.10(455B). The expiration date of the upgraded certificate shall be the same as the unexpired certificate. A person who upgrades a certificate during the biennium must also renew the upgraded certificate in accordance with 567—81.13(455B) and 567—81.14(455B,272C) to maintain the person's certification.

567—81.16(455B) *Operator by affidavit.*

81.16(1) *Affidavit allowance.* The owner of a plant or distribution system that is required to have a Grade A, I, IL, II, IIL certified operator may sign an affidavit with a certified operator of the required classification and grade.

81.16(2) *Affidavit requirements.* This affidavit will verify that the certified operator is the operator-in-charge and has direct responsibility for a plant or distribution system that does not have first rights on the services of that operator. The affidavit form shall be provided by the director and shall require the name and signature of the certified operator, the operator's certification number, class and grade, and the date of last renewal of the operator's certificate. The affidavit form shall be proof that the certified operator has agreed to be directly responsible for the operation and maintenance of the plant or distribution system. The director may specify additional operational and maintenance requirements based on the complexity and size of the plant or distribution system. Four duly notarized copies of the affidavit must be returned to and approved by the director, based upon the ability of the certified operator to properly operate and maintain additional facilities. In event of disapproval, the owner of the plant or distribution system must terminate the agreement with the certified operator and seek the services of another certified operator. Both the owner of the plant or distribution system and the certified operator shall notify the director at least 30 days before the termination of the agreement.

567—81.17(455B,272C) Disciplinary actions.

81.17(1) *Reasons for disciplinary action.* Disciplinary action may be taken against a certified operator on any of the grounds specified in Iowa Code section 455B.219 and chapter 272C and the following more specific grounds.

a. Failure to use reasonable care or judgment or to apply knowledge or ability in performing the duties of a certified operator.

(1) Wastewater operator duties. Examples of a wastewater operator's duties are specified in the Water Environment Federation Manual of Practice #11, 1996; California State University—Sacramento (CSUS) Operation of Wastewater Treatment Plants, Volume I, 4th edition, 1998; CSUS Operation of Wastewater Treatment Plants, Volume II, 4th edition, 1998; CSUS Advanced Waste Treatment, 3rd edition, 1998; and 567—Chapters 60 through 64, 67, and 83, Iowa Administrative Code.

(2) Water treatment or distribution operator duties. Examples of a water treatment or distribution operator's duties are specified in the American Water Works Association (AWWA) Manuals of Water Supply Practice (Volumes 1, 3-7, 9, 11-12, 14, 17, 19-38, 41-42, 44-48); AWWA Water Supply Operations Series, 2nd edition: Vol. 1, 1995; Vol. 2, 1995; Vol. 3, 1996; Vol. 4, 1995; and Vol. 5, 1995; AWWA Water Distribution Operator Handbook, 2nd edition, 1976; and California State University—Sacramento (CSUS) Water Treatment Plant Operation, Volume I, 4th edition, 1999; CSUS Water Treatment Plant Operation, Volume II, 3rd edition, 1998; CSUS Small Water System Operation and Maintenance, 4th edition, 1999; CSUS Water Distribution System Operation and Maintenance, 4th edition, 2000; and 567—Chapters 40 through 43 and 83, Iowa Administrative Code.

b. Failure to submit required records of operation or other reports required under applicable permits or rules of the department, including failure to submit complete records or reports.

c. Knowingly making any false statement, representation, or certification on any application, record, report or document required to be maintained or submitted under any applicable permit or rule of the department.

d. Fraud in procuring a license.

e. Professional incompetence.

f. Knowingly making misleading, deceptive, untrue or fraudulent representations in the practice of the licensee's profession or engaging in unethical conduct or practice harmful or detrimental to the public. Proof of actual injury need not be established.

g. Habitual intoxication or addiction to the use of drugs.

h. Conviction of a felony related to the profession or occupation of the licensee. A copy of the record of conviction or plea of guilty shall be conclusive evidence.

i. Fraud in representations as to skill or ability.

j. Use of untruthful or improbable statements in advertisements.

k. Willful or repeated violations of the provisions of Iowa Code chapter 272C or 455B, division III.

81.17(2) *Disciplinary sanctions.* Disciplinary sanctions may include those specified in Iowa Code section 272C.3(2) and the following:

a. *Revocation of a certificate.* Revocation may be permanent without chance of recertification or for a specified period of time.

b. *Partial revocation or suspension.* Revocation or suspension of the practice of a particular aspect of the operation of a plant or distribution system, including the restriction of operation to a particular plant or distribution system, or a particular type of plant or distribution system.

c. *Probation.* Probation under specified conditions relevant to the specific grounds for disciplinary action.

d. *Additional education, training, and examination requirements.* Additional education, training, and reexamination may be required as a condition of reinstatement.

e. *Penalties.* Civil penalties not to exceed \$1,000 may be assessed for causes identified in 81.17(1).

81.17(3) *Procedure.*

a. Initiation of disciplinary action. The department staff shall initiate a disciplinary action by conducting such lawful investigation as is necessary to establish a legal and factual basis for action. The administrator of the environmental protection commission or designee shall make a decision as to any disciplinary action based on the department staff recommendations. Except as specified by this subrule, the disciplinary action shall be initiated by a notice of intended action in accordance with rule 561—7.16(17A,455A). At any time, the licensee and the department may enter into a settlement agreement, subject to approval by the director, which provides for a disciplinary sanction.

b. Request for hearing. Notwithstanding references in 561—subrule 7.16(4), a licensee shall be deemed to have waived any right to a contested case hearing unless the licensee appeals the action and requests a hearing within 30 days of receipt of the notice of intended action. If a timely appeal is filed, further contested case procedures shall apply in accordance with 561—Chapter 7.

c. Appeal and review of proposed decision. After a contested case hearing conducted in accordance with rule 561—7.14(17A,455A), the director shall review the presiding officer's proposed decision issued in accordance with 561—subrule 7.15(3). The proposed decision shall constitute a final decision of the director and the department unless the licensee or the director and department appeal the proposed decision to the environmental protection commission within 30 days of receipt as provided in 561—subrule 7.15(5).

d. Effective date of suspension or revocation. Notwithstanding any contrary interpretation in 561—subrule 7.16(7), suspension, revocation or other disciplinary action shall be effective 30 days after receipt of the notice of intended action if the licensee fails to file a timely appeal and request for hearing. If a contested case hearing is timely requested, the disciplinary action is effective as specified in the presiding officer's proposed decision unless the licensee obtains a stay of the action in accordance with 561—subrule 7.15(7) pending a timely appeal to the environmental protection commission.

e. Emergency disciplinary action. The director may initiate an emergency suspension or other disciplinary action upon such grounds and following those procedures as provided in 561—subrule 7.16(6). The terms of the emergency order shall be effective upon service as provided in 561—subrule 7.16(7). The department shall promptly give notice of an opportunity to appeal and request a contested case hearing following the procedures as specified above.

f. Reinstatement of revoked certificates. Upon revocation of a certificate in accordance with the authority provided in Iowa Code section 455B.219 and chapter 272C, application for certification may be allowed after two years from the date of revocation unless otherwise specified in accordance with 81.17(2). Any such applicant must meet all education and experience eligibility requirements pursuant to 567—81.7(455B), and successfully complete an examination and be certified in the same manner as a new applicant.

81.17(4) Noncompliance with child support order procedures. Upon receipt of a certification of noncompliance with a child support obligation as provided in Iowa Code section 252J.7, the department will initiate procedures to deny an application for certification or renewal, or to suspend a certification in accordance with Iowa Code section 252J.8(4). The department shall issue to the person by restricted certified mail a notice of its intent to deny or suspend operator certification based on receipt of a certificate of noncompliance. The suspension or denial shall be effective 30 days after receipt of the notice unless the person provides the department with a withdrawal of the certificate of noncompliance from the child support recovery unit as provided in Iowa Code section 252J.8(4) "c." Pursuant to Iowa Code section 252J.8(4), the person does not have a right to a hearing before the department to contest the denial or suspension action under this subrule but may seek a hearing in district court in accordance with Iowa Code section 252J.9.

These rules are intended to implement Iowa Code sections 455B.211 to 455B.224 and chapter 272C.

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CHAPTER 83
LABORATORY CERTIFICATION
[Prior to 4/10/96, see 567—Chapter 42]

PART A
GENERAL

567—83.1(455B) Authority, purpose, and applicability.

83.1(1) Authority. Pursuant to Iowa Code section 455B.113, a laboratory certification program is required for laboratories performing analyses of samples which are required to be submitted to the department as a result of Iowa Code provisions, rules, operation permits, or administrative orders. Pursuant to Iowa Code section 455B.114, the department may suspend or revoke the certification of a laboratory upon determination of the department that the laboratory no longer fulfills one or more of the requirements for certification.

83.1(2) Purpose. The purpose of these rules is to provide the procedures for laboratories to use to apply for certification, to establish laboratory certification fees, to maintain certification, and to provide the appropriate methods and references for evaluating laboratory competence including the requirements for laboratories to become certified.

83.1(3) Applicability to environmental program areas.

a. Water supply (drinking water). The requirements of this chapter apply to all laboratories conducting drinking water analyses pursuant to 567—Chapters 40, 41, 42, and 43. Routine, on-site monitoring for alkalinity, calcium, conductivity, residual disinfectant, orthophosphate, pH, silica, temperature, turbidity and on-site operation and maintenance-related analytical monitoring are excluded from this requirement, and may be performed by a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, any person under the supervision of a Grade I, II, III, or IV certified operator meeting the requirements of 567—Chapter 81, or a laboratory certified by the department to perform water supply analyses under this chapter.

b. Underground storage tanks. The requirements of this chapter also apply to all laboratories conducting underground storage tank analyses for petroleum constituents pursuant to 567—Chapter 135. Routine on-site monitoring conducted by or for underground storage tank owners for leak detection or a nonregulatory purpose is excluded from this requirement.

c. Wastewater. The requirements of this chapter also apply to all laboratories conducting analyses of wastewater, groundwater or sewage sludge pursuant to 567—Chapters 63, 67, and 69. Routine on-site monitoring for pH, temperature, dissolved oxygen, total residual chlorine and other pollutants that must be analyzed immediately upon sample collection, settleable solids, physical measurements such as flow and cell depth, and operational monitoring tests specified in 567—subrule 63.3(4) are excluded from this requirement.

d. Solid waste and contaminated sites. The requirements of this chapter also apply to all laboratories conducting analyses of solid waste parameters pursuant to 567—Chapters 100 through 130, contaminated site parameters pursuant to 567—Chapters 133 and 137, and regulated substances other than petroleum parameters regulated under 567—Chapter 135. Any parameter that must be analyzed immediately upon sample collection is excluded from the requirements of this chapter. Any samples collected or testing conducted that is not part of the specific monitoring required by the department for regulatory purposes are also excluded from the requirements of this chapter.

[ARC 9915B, IAB 12/14/11, effective 1/18/12]

567—83.2(455B) Definitions.

“*Certified*” means a laboratory demonstrates to the satisfaction of the department its ability to consistently produce valid data within the acceptance limits as specified within the department’s requirements for certification and meets the minimum requirements of this chapter and all applicable regulatory requirements. A laboratory may be certified for an analyte, an analytical series, or an environmental program area, except in the UST program area, where certification for individual analytes is not allowed.

“*Environmental program area*” means the water supply (drinking water) program, underground storage tank program, wastewater program, or solid waste and contaminated site program pursuant to 83.1(3).

“*Manual for the Certification of Laboratories Analyzing Environmental Samples for the Iowa Department of Natural Resources*” (2017) (Iowa Manual) is incorporated by reference in this chapter.

Chapter 1 of the Iowa Manual pertains to certification of laboratories analyzing samples of drinking water and incorporates by reference the Manual for the Certification of Laboratories Analyzing Drinking Water, 5th edition, January 2005, EPA document 815-R-05-004, January 2005; Supplement 1, June 2008, EPA 815-F-08-006; and Supplement 2, November 2012, EPA 815-F-12-006.

Chapter 2 of the Iowa Manual, (2017), pertains to laboratories analyzing samples for the underground storage tank program.

Chapter 3 of the Iowa Manual, (2017), pertains to laboratories analyzing samples for wastewater and sewage sludge disposal programs.

Chapter 4 of the Iowa Manual, (2017), pertains to laboratories analyzing samples for the solid waste and contaminated site programs.

“*Performance evaluation (PE) sample*” means a reference sample provided to a laboratory for the purpose of demonstrating that a laboratory can successfully analyze the sample within limits of performance specified by the department. The true value of the concentration of the reference material is unknown to the laboratory at the time of analysis. A PE sample may also be referred to as a proficiency testing sample or PT sample.

“*Provisional certification*” means a laboratory has deficiencies, which must be corrected within the specified time frames listed in 83.7(2) “d,” but demonstrates to the satisfaction of the department its ability to consistently produce valid data within the acceptance limits as specified within the department’s certification requirements.

“*Revoked certification*” means a laboratory no longer fulfills the requirements of this chapter, and certification is revoked by the director upon determination of the director that the laboratory no longer fulfills the requirements for certification (455B.114).

“*Suspended certification*” means a temporary suspension of certification for a laboratory, conditional upon meeting the time frames in 83.7(4) “d” for the correction of the deficiency.

“*Temporary certification*” means short-term transitional certification granted in certain circumstances when the department implements certification in a new environmental program area. [ARC 3735C, IAB 4/11/18, effective 5/16/18]

PART B CERTIFICATION PROCESS

567—83.3(455B) Application for laboratory certification.

83.3(1) Application forms. Application for laboratory certification, other than for temporary certification, shall be made on forms provided by the department and shall be accompanied by the nonrefundable fee specified in 83.3(2). The application for renewal of certification shall be made at least 60 days prior to the certification expiration date. The department may require submission of additional information necessary to evaluate the application. All required documentation must be supplied to the department prior to the on-site visit. Failure to submit a complete application may result in denial of the renewal.

83.3(2) Fees and expenses.

a. A nonrefundable fee for the administration, completion of on-site laboratory surveys and assessments, and enforcement of laboratory certification requirements shall be paid with the certification application.

(1) The on-site visit will not be conducted and certification will not be issued until the fees and expenses are paid and all other certification requirements are met. The fee for certification will not be refunded if an on-site visit is not performed.

(2) Out-of-state laboratories will be responsible for paying the expenses of an on-site visit, in addition to the standard certification fee if required, and the department or its agent will bill the out-of-state laboratory directly for the expenses.

(3) When a laboratory's certification is changed to "provisional" or "suspended" and the period for correcting deficiencies extends beyond the certification period, the laboratory must continue to pay the required fees in order to maintain its certification status.

(4) Additional fees. Additional fees will be assessed for the following, and the department or its agent will bill the laboratory directly.

1. The laboratory is responsible for paying for any additional on-site visits, at a fee of \$300 per visit. An example of this is when an additional on-site visit is required when a laboratory seeks certification for an entirely new set of parameters for which it had previously not been certified.

2. When an on-site visit is required to inspect for deficiencies that the laboratory has been required to correct, the fee is \$500 per visit.

b. Certification in multiple environmental program areas. Where a laboratory is certified for the same analyte in more than one environmental program area, the laboratory must meet all the applicable certification requirements in addition to the payment of the fees.

c. The applicable fees shall be based on the type of analytical service provided as follows:

| ANALYTICAL GROUP | REGULATORY PROGRAM & PARAMETERS ¹ | FEE |
|------------------------------|--|----------------|
| Asbestos | SDWA | \$400 |
| Basic Drinking Water | SDWA (includes total coliform bacteria, <i>E. coli</i> , heterotrophic plate count, nitrate, nitrite, and fluoride) | \$800 |
| Basic Wastewater | CWA (includes BOD5, cBOD5, total suspended solids, and ammonia) | \$400 |
| Bacteria | CWA (includes total coliform, fecal coliform, and <i>E. coli</i>) | \$800 |
| | SDWA (includes total coliform, <i>E. coli</i> , and heterotrophic plate count) | \$800 |
| | SDWA & CWA combined | \$1,300 |
| Dioxin | SDWA | \$800 |
| Effluent Toxicity Testing | CWA | \$800 |
| Inorganics, including metals | CWA metals, inorganic compounds, and physical characteristics (\$400 per analyte up to a maximum of \$1,600) | \$400 to 1,600 |
| | SDWA (includes metals, nitrate, nitrite, ammonia, cyanide, fluoride, bromate, bromide, chlorite, and total organic carbon) | \$1,600 |
| | SW/CS | \$1,600 |
| | CWA & SDWA combined | \$2,400 |
| | CWA & SW/CS combined | \$2,400 |
| | CWA, SDWA, and SW/CS combined | \$2,800 |
| Radionuclides | CWA | \$400 |
| | SDWA (includes gross alpha, gross beta, photon emitters, radium, strontium, tritium, and uranium) | \$400 |
| | SDWA & CWA combined | \$650 |

| ANALYTICAL GROUP | REGULATORY PROGRAM & PARAMETERS ¹ | FEE |
|--|---|-------------------|
| Synthetic Organic Chemicals (SOC) | CWA | \$1,600 |
| | SDWA | \$1,600 |
| | SW/CS | \$1,600 |
| | CWA & SDWA combined | \$2,400 |
| | CWA & SW/CS combined | \$2,400 |
| | CWA, SDWA, and SW/CS combined | \$2,800 |
| Volatile Organic Chemicals (VOC) | CWA | \$1,600 |
| | SDWA | \$1,600 |
| | SW/CS | \$1,600 |
| | CWA & SDWA combined | \$2,400 |
| | CWA & SW/CS combined | \$2,400 |
| | CWA, SDWA, and SW/CS combined | \$2,800 |
| Underground Storage Tank Program Methods (UST) | OA1 and OA2 for UST, CWA, & SW/CS programs | \$1,600 |
| | OA1, OA2, PAH, and Air Gas for UST, CWA, & SW/CS programs | \$2,000 |
| Other analyte ² | SDWA, CWA, UST, or SW/CS | \$400 per analyte |

¹CWA: Analysis of wastewater samples for the federal Clean Water Act.

SDWA: Analysis of drinking water samples for the federal Safe Drinking Water Act.

SW/CS: Analysis of water, soil, or solid samples for the solid waste or contaminated sites programs.

UST: Analysis of water and soil samples for the underground storage tank program.

²The fee for an additional analyte may be charged at the discretion of the appraisal authority.

d. Payment of fees. Fees shall be paid by bank draft, check, money order, credit card, electronic payment, or other means acceptable to the department, made payable to the Iowa Department of Natural Resources. Credit card or electronic payment may incur an additional fee. Purchase orders are not an acceptable form of payment.

83.3(3) Reciprocity. Reciprocal certification of out-of-state laboratories by Iowa, and of Iowa laboratories by other states or accreditation providers, is allowed. A laboratory must meet all Iowa certification criteria and pay all applicable fees as listed in this chapter. Any laboratory which is granted reciprocal certification in Iowa using primary certification from another state or provider is required to report any change in certification status from the accrediting state or provider to the department within 15 days of notification. A laboratory that loses primary certification, either in its resident state program or third-party accreditation program, will also immediately lose certification for the same program area and parameters in Iowa, pursuant to 83.7(5)“a”(9).

a. Out-of-state laboratories. Where an out-of-state laboratory has received an on-site visit within its own state, the fee for certification shall not be reduced if an on-site visit is not performed by Iowa.

b. Third-party accreditation. The department may accept third-party accreditation from national accreditation providers on an individual basis.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—83.4(455B) Procedure for initial certification for laboratories analyzing solid waste and contaminated site program parameters. Rescinded ARC 3735C, IAB 4/11/18, effective 5/16/18.

567—83.5(455B) Procedures for certification of new laboratories or changes in certification. Laboratories that wish to become certified to conduct testing for an analyte or a method after the deadline for initial certification has passed, and any laboratory seeking initial certification, shall follow the procedures specified in 567—83.6(455B) for laboratory recertification. For changes in certification, the relevant fee must accompany the application where appropriate.

567—83.6(455B) Laboratory recertification. Laboratories shall be recertified every two years after initial certification. Applications for recertification must be on forms provided by the department and must be postmarked at least 60 days prior to the renewal date. Applications shall be accompanied by the fee specified in 83.3(2). To be recertified, laboratories must meet the following requirements.

83.6(1) *Approved methodology required.* Laboratories must use the approved methodology for all analyses the results of which are to be submitted to the department. A laboratory may not analyze and report data from samples collected for an environmental program area until certified in that area.

83.6(2) *Performance evaluation (proficiency testing) samples required.* Certified laboratories must satisfactorily analyze PEs at least once every 12 months for each analyte by each method for which the laboratory wishes to retain certification unless a PE sample is not available for the particular analyte or method. Results must be submitted to Iowa department of natural resources and the state of Iowa hygienic laboratory, or as otherwise directed, along with a statement of the method used within 30 days of receipt from the provider. The laboratory must maintain records of all PE samples for a minimum of 5 years.

83.6(3) *Notification of major changes.* Laboratories must notify the department, in writing, within 15 days of major changes in essential personnel, equipment, laboratory location, or other major change which might alter or impair analytical capability. An example of a major change in essential personnel includes the loss or replacement of the laboratory supervisor, or a trained and experienced analyst is no longer available to analyze a particular parameter for which certification has been granted.

83.6(4) Site visits.

a. Certification of the State of Iowa Hygienic Laboratory. The department has designated the State of Iowa Hygienic Laboratory (SHL) as its appraisal authority for laboratory certification. The SHL is responsible for attaining and maintaining laboratory certification for the SDWA program that is acceptable to the U.S. Environmental Protection Agency (EPA). The SHL quality assurance officer is responsible for the certification of SHL for those programs with no available EPA certification program, including wastewater, underground storage tank, solid waste, and contaminated site programs. The SHL quality assurance officer reports directly to the office of the SHL director and operates independently of all areas of the laboratory generating data to ensure complete objectivity in the evaluation of laboratory operations. The quality assurance officer will schedule a biennial on-site inspection of the SHL and review results for acceptable performance. Inadequacies or unacceptable performance shall be reported by the quality assurance officer to the SHL and the department for correction. The department shall be notified if corrective action is not taken.

b. On-site visits. Laboratories must consent to a periodic site visit by the department or its designee, at least every two years. However, an on-site visit may be conducted more frequently if the laboratory undergoes a major change which may alter or impair analytical capability, fails a PE sample analysis, or if the department questions an aspect of data submitted which is not satisfactorily resolved.

83.6(5) Period of validity. Certification shall be valid for a period not to exceed two years from the date of issuance, except in the case of reciprocal certification of an out-of-state laboratory. Reciprocal certification shall be valid for a period equal to that of the resident state in which the laboratory is certified, but shall not exceed two years. Certification shall remain in effect provided a laboratory has submitted a timely and complete application, until certification is either renewed or revoked.

83.6(6) Reporting requirements. Laboratories may not analyze or report sample results for any analyte, analytical series, or environmental program area until the initial certification status of “certified” or “temporary” has been granted by the department. Any data generated before certification status is granted will be considered invalid for compliance purposes. A laboratory with “provisional” status may analyze and report analyses for compliance purposes.

A certified laboratory may contract analyses to another certified laboratory. The responsibility lies with the primary certified laboratory contracting for services to verify that the secondary contracting laboratory is certified by the department and to ensure that reporting requirements and deadlines are met.

a. Water supply program.

(1) Certified laboratories must report to the department, or its designee, all analytical test results for all public water supplies in a manner acceptable to the department, using forms, including electronic forms, provided or approved by the department or by electronic means acceptable to the department. If a public water supply is required by the department to collect and analyze a sample for an analyte not normally required by 567—Chapters 41 and 43, the laboratory testing for that analyte must also be certified and report the results of that analyte to the department. It is the responsibility of the laboratory to correctly assign and track the sample identification number as well as facility ID and source/entry point data for all reported samples.

1. The following are examples of sample types for which data results must be reported:

- Routine: a regular sample which includes samples collected for compliance purposes from such locations as the source/entry point and in the distribution system, at various sampling frequencies;
- Repeat: a sample which must be collected after a positive result from a routine or previous repeat total coliform sample, per 567—paragraph 41.2(1) “j.” Repeat samples must be analyzed at the same laboratory from which the associated original routine sample was analyzed;
- Confirmation: a sample which verifies a routine sample, normally used in determination of compliance with a health-based standard, such as nitrate;
- Special: a nonroutine sample, such as raw, plant, and troubleshooting samples, which cannot be used to comply with monitoring requirements assigned by the department;
- Maximum residence time: a sample which is collected at the maximum residence time location in the distribution system, usually for disinfection byproduct measurement; and
- Replacement: a sample which replaces a missed sample from a prior monitoring period resulting in a monitoring violation.

2. The following additional types of data must be reported to the department:

- Monthly Operation Report (MOR) data which has been specifically required by the department to demonstrate compliance with public health standards;
- Chemical results not required to be analyzed but which are detected during analysis, such as detection of a synthetic organic chemical during a routine analysis of that related analytical series for compliance reporting; and
- Raw water sampling results specifically covered by 567—Chapters 40 to 43 for new surface water or groundwater sources, or reconstruction of groundwater sources.

3. The following are examples of data results that are not required to be reported by the laboratory to the department:

- Routine MOR data;
- Distribution samples for the Total Coliform Rule (567—subrule 41.2(1)) for water main repair or installation; or
- Results for contaminants that are not required by the department to be analyzed, which are below detection level.

4. The sample type cannot be changed after submittal to the laboratory, without written approval by the department. The prescreening, splitting, or selective reporting of compliance samples is not allowed.

(2) Certified laboratories must report all analytical results to the public water supply for which the analyses were performed.

(3) Analytical results must be reported to and received by the department by the seventh day of the month following the month in which the samples were analyzed.

(4) In addition to the monthly reporting of the analytical results, the following results must be reported within 24 hours of the completion of the analysis to the department by email or other method acceptable to the department, and to the public water supply for which the analyses were conducted:

1. Results of positive routine coliform bacteria samples, and all repeat and follow-up samples, reported within 24 hours of the completion of each sample’s analysis.

2. Results of any contaminant which exceeds public drinking water standards (maximum contaminant level, treatment technique, action level, or health advisory), and any subsequent confirmation samples.

For results available outside of routine business hours, the results must also be reported to the department's Environmental Emergency Reporting Hotline number at (515)725-8694.

(5) If requested by the department, certified laboratories shall report their method detection levels, levels of quantitation, and any other pertinent information when reporting results for public water supplies.

b. Underground storage tank program. Certified laboratories must report to the client requesting the analysis and include the information required in 567—subrule 135.10(2) in their laboratory report.

c. Wastewater program. Certified laboratories must report to the client requesting the analysis and include the information required in 567—paragraphs 63.2(2) “b” to “e” in their laboratory report.

d. Solid waste and contaminated site programs. Certified laboratories must report to the client requesting the analysis and include the information required in paragraph 83.6(7) “d” and 567—subrule 103.2(8).

83.6(7) Performance evaluation (PE) and acceptance limits. All PE samples must be obtained from EPA; a provider accredited by EPA, the National Environmental Laboratory Accreditation Program (NELAP) or National Institute of Standards and Technology (NIST); or other provider acceptable to the department. All PE samples must have statistical acceptance limits. Certain environmental program areas may have specific PE requirements, as follows:

a. Water supply program. Laboratories must be able to achieve at least the method detection limit for each specific analyte as listed in 567—Chapter 41, in addition to any method detection limit requirement listed in this paragraph.

(1) Volatile organic chemical (VOC). Analysis for VOCs shall only be conducted by laboratories certified by EPA or the department or its authorized designee according to the following conditions. To receive approval to conduct analyses for the VOC contaminants in 567—subparagraph 41.5(1) “b”(1), except for vinyl chloride, the laboratory must:

1. Analyze PE samples provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification.

2. Achieve the quantitative acceptance limits for at least 80 percent of the regulated organic chemicals included in the PE sample, except for vinyl chloride.

3. Achieve quantitative results on the PE samples within plus or minus 20 percent of the actual amount of the substances when the actual amount is greater than or equal to 0.010 mg/L.

4. Achieve quantitative results on the PE samples within plus or minus 40 percent of the actual amount of the substances when the actual amount is less than 0.010 mg/L.

5. Achieve a VOC method detection limit of 0.0005 mg/L.

(2) Vinyl chloride. To receive approval for vinyl chloride, the laboratory must:

1. Analyze PE samples which include vinyl chloride provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification.

2. Achieve quantitative results on the PE samples within plus or minus 40 percent of the actual amount of vinyl chloride.

3. Achieve a method detection limit of 0.0005 mg/L.

(3) Synthetic organic chemical (SOC). Analysis for SOCs shall be conducted only by laboratories certified by EPA or the department or its authorized designee. To receive approval to conduct analyses for the SOC contaminants in 567—subparagraph 41.5(1) “b”(2), the laboratory must:

1. Analyze PE samples which include those substances provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification.

2. For each contaminant that has been included in the PE sample, achieve quantitative results on the analyses that are within the following acceptance limits:

ACCEPTANCE LIMITS

| <u>Contaminant</u> | <u>Acceptance Limit, in percent</u> |
|---|-------------------------------------|
| Aalachlor | (+ or -) 45 |
| Aldicarb | 2 standard deviations |
| Aldicarb sulfoxide | 2 standard deviations |
| Aldicarb sulfone | 2 standard deviations |
| Atrazine | (+ or -) 45 |
| Benzo(a)pyrene | 2 standard deviations |
| Carbofuran | (+ or -) 45 |
| Chlordane | (+ or -) 45 |
| 2,4-D | (+ or -) 50 |
| Dalapon | 2 standard deviations |
| Dibromochloropropane (DBCP) | (+ or -) 40 |
| Di(2-ethylhexyl)adipate | 2 standard deviations |
| Di(2-ethylhexyl)phthalate | 2 standard deviations |
| Dinoseb | 2 standard deviations |
| Diquat | 2 standard deviations |
| Endothall | 2 standard deviations |
| Endrin | (+ or -) 30 |
| Ethylene dibromide (EDB) | (+ or -) 40 |
| Glyphosate | 2 standard deviations |
| Heptachlor | (+ or -) 45 |
| Heptachlor epoxide | (+ or -) 45 |
| Hexachlorobenzene | 2 standard deviations |
| Hexachlorocyclopentadiene | 2 standard deviations |
| Lindane | (+ or -) 45 |
| Methoxychlor | (+ or -) 45 |
| Oxamyl | 2 standard deviations |
| Pentachlorophenol | (+ or -) 50 |
| Picloram | 2 standard deviations |
| Polychlorinated biphenyls (PCBs as decachlorobiphenyl) | 0 - 200 |
| Simazine | 2 standard deviations |
| 2,3,7,8-TCDD (Dioxin) | 2 standard deviations |
| 2,4,5-TP (Silvex) | 2 standard deviations |
| Toxaphene | (+ or -) 45 |

(4) Inorganic chemical (IOC). Analysis for IOCs shall be conducted only by laboratories certified by EPA or the department or its authorized designee. To receive approval to conduct analyses for ammonia, antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nitrate, nitrite, selenium and thallium, the laboratory must:

1. Analyze PE samples provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year.

2. For each contaminant that has been included in the PE sample and for each method for which the laboratory desires certification, achieve quantitative results on the analyses that are within the following acceptance limits:

ACCEPTANCE LIMITS

| <u>Contaminant</u> | <u>Acceptance Limit</u> |
|--------------------|---|
| Ammonia | (+ or -) 20% at greater than or equal to 0.3 mg/L |
| Antimony | (+ or -) 30% at greater than or equal to 0.006 mg/L |
| Arsenic | (+ or -) 30% at greater than or equal to 0.003 mg/L |
| Asbestos | 2 standard deviations based on study statistics |
| Barium | (+ or -) 15% at greater than or equal to 0.15 mg/L |
| Beryllium | (+ or -) 15% at greater than or equal to 0.001 mg/L |
| Cadmium | (+ or -) 20% at greater than or equal to 0.002 mg/L |
| Chromium | (+ or -) 15% at greater than or equal to 0.01 mg/L |
| Cyanide | (+ or -) 25% at greater than or equal to 0.1 mg/L |
| Fluoride | (+ or -) 10% at greater than or equal to 1 to 10 mg/L |
| Mercury | (+ or -) 30% at greater than or equal to 0.0005 mg/L |
| Nitrate | (+ or -) 10% at greater than or equal to 0.4 mg/L |
| Nitrite | (+ or -) 15% at greater than or equal to 0.4 mg/L |
| Selenium | (+ or -) 20% at greater than or equal to 0.01 mg/L |
| Thallium | (+ or -) 30% at greater than or equal to 0.002 mg/L |

(5) Lead and copper. To obtain certification to conduct analyses for lead and copper, laboratories must:

1. Analyze PE samples that include lead and copper provided by EPA, the department, or a third-party provider acceptable to the department, at least once a year by each method for which the laboratory desires certification; and

2. Achieve quantitative results on the analyses that are within the following acceptance limits:

- Lead: plus or minus 30 percent of the actual amount in the PE sample when the actual amount is greater than or equal to 0.005 mg/L. The practical quantitation level or PQL for lead is 0.005 mg/L; and

- Copper: plus or minus 10 percent of the actual amount in the PE sample when the actual amount is greater than or equal to 0.050 mg/L. The practical quantitation level or PQL for copper is 0.050 mg/L; and

3. Be currently certified by EPA or the department to perform analyses to the specifications described in 567—paragraph 41.4(1) “g.”

(6) Disinfection byproducts. To obtain certification to conduct analyses for disinfection byproducts listed in 567—paragraph 41.6(1) “b,” laboratories must:

1. Analyze PE samples approved by EPA, the department, or a third-party provider acceptable to the department at least once during each period of 12 consecutive months by each method for which the laboratory desires certification;

2. Achieve quantitative results on the PE sample analyses that are within the following acceptance limits:

| Disinfection Byproduct | Acceptance limits (plus or minus this percent of true value) | Comments |
|------------------------|--|--|
| TTHM | | Laboratory must meet all four individual THM acceptance limits in order to successfully pass a PE sample for TTHM. |
| Bromoform | 20 | |
| Bromodichloromethane | 20 | |
| Chloroform | 20 | |
| Dibromomethane | 20 | |
| HAA5 | 40 | Laboratory must meet the acceptance limits for 4 of the 5 HAA5 compounds in order to successfully pass a PE sample for HAA5. |
| Monobromoacetic Acid | 40 | |
| Dibromoacetic Acid | 40 | |
| Monochloroacetic Acid | 40 | |
| Dichloroacetic Acid | 40 | |
| Trichloroacetic Acid | 40 | |
| Chlorite | 30 | |
| Bromate | 30 | |

3. Report quantitative data for concentrations at least as low as the levels listed in the following table for all disinfection byproduct samples analyzed for compliance with 567—41.6(455B).

| Disinfection Byproduct | Minimum reporting level, mg/L ¹ | Comments |
|------------------------|--|---|
| TTHM ² | | |
| Bromoform | 0.0010 | |
| Bromodichloromethane | 0.0010 | |
| Chloroform | 0.0010 | |
| Dibromomethane | 0.0010 | |
| HAA5 ² | | |
| Monobromoacetic Acid | 0.0010 | |
| Dibromoacetic Acid | 0.0010 | |
| Monochloroacetic Acid | 0.0020 | |
| Dichloroacetic Acid | 0.0010 | |
| Trichloroacetic Acid | 0.0010 | |
| Chlorite | 0.020 | Applicable to chlorite monitoring conducted by a certified laboratory required under 567—paragraphs 41.6(1)“c”(3)“2” and 41.6(1)“c”(3)“3” |
| Bromate | 0.0050 or 0.0010 | Laboratories that use EPA Method 317.0 Revision 2, 321.8, or 326.0 must meet a 0.0010 mg/L MRL for bromate. |

¹The calibration curve must encompass the regulatory minimum reporting level (MRL) concentration. Data may be reported for concentrations lower than the regulatory MRL as long as the precision and accuracy criteria are met by analyzing an MRL check standard at the lowest reporting limit chosen by the laboratory. The laboratory must verify the accuracy of the calibration curve at the MRL concentration by analyzing an MRL check standard with a concentration less than or equal to 100 percent of the MRL with each batch of samples. The measured concentration for the MRL check standard must be plus or minus 50 percent of the expected value, if any field sample in the batch has a concentration less than five times the regulatory MRL. Method requirements to analyze higher concentration check standards and meet tighter acceptance criteria for them must be met in addition to the MRL check standard requirement.

²When adding the individual trihalomethanes or haloacetic acid concentrations to calculate the TTHM or HAA5 concentrations, respectively, a zero is used for any analytical result that is less than the MRL concentration for that disinfection byproduct, unless otherwise specified by the department.

b. Underground storage tank program. A laboratory must achieve acceptable results on PE samples every 12 months within plus or minus 20 percent of the true value for individual compounds (i.e., benzene, ethylbenzene, toluene, xylene by OA-1) and plus or minus 40 percent of the true value for multicomponent materials (i.e., gasoline, diesel fuel, motor oil by either OA-1 or OA-2). The PE samples must be provided by EPA, the department, or a third-party provider acceptable to the department.

c. Wastewater program. Achieve acceptable quantitative results every 12 months on PE samples equivalent to those used in the Water Pollution (WP) proficiency program, or the Discharge Monitoring Report Quality Assurance (DMRQA) program, both of which are administered by EPA or its designee.

d. Solid waste and contaminated site programs. Achieve acceptable quantitative results every 12 months on PE samples provided by EPA, the department, or a third-party provider acceptable to the department.

83.6(8) Record keeping. The laboratory certification program appraisal authority must retain the records for on-site laboratory assessments and certification program reviews. The records must be maintained in an easily accessible manner for a period of at least six years to include the last two on-site audits. The records include correspondence used to determine compliance with the laboratory certification program requirements and may include checklists, corrective action reports, final reports, certificates, performance evaluation/proficiency testing study results, and any other related documents. [ARC 9915B, IAB 12/14/11, effective 1/18/12; ARC 3735C, IAB 4/11/18, effective 5/16/18]

567—83.7(455B) Criteria and procedure for provisional, suspended, and revoked laboratory certification.

83.7(1) Provisional certification criteria.

a. The department may downgrade certification to “provisional” status based on cause. The reasons for which a laboratory may be downgraded to “provisionally certified” status include, but are not limited to, the following list.

(1) Failure to analyze a performance evaluation (PE) sample annually within Iowa acceptance limits;

(2) Failure to notify the department within 15 days of changes in essential personnel, equipment, laboratory facilities or other major change which might impair analytical capability;

(3) Failure to satisfy the department that the laboratory is maintaining the required standard of quality based on an on-site visit;

(4) Failure to report compliance data in a timely manner to the department or the client, thereby preventing timely compliance with environmental program regulations.

b. The department may assess an administrative penalty for a laboratory’s failure to comply with the laboratory certification or reporting requirements.

c. A laboratory will not be granted provisional certification by the department for water supply contaminants which pose an acute risk to human health, including nitrate, nitrite, and *Escherichia coli* bacteria.

83.7(2) Provisional certification procedure.

a. Notification to the laboratory. If a laboratory is subject to downgrading to “provisional” status on the basis of 83.7(1), the department will notify the laboratory or owner in writing of the downgraded status. Certification may be downgraded to provisional for an analyte, a related analytical series, an environmental program area, or the entire laboratory.

b. Reporting. A provisionally certified laboratory may continue to analyze samples for compliance purposes, but must notify the laboratory’s IDNR-regulated clientele and other state certifying agencies of the change in laboratory certification status. If there is cause to question the quality of the data generated by the laboratory, the department may suspend the laboratory’s ability to submit data to the department

for any or all analytes, pursuant to 83.7(3), which includes suspension of the ability of the laboratory's client to report the data of questionable quality to the department.

c. Right to appeal. There is no appeal for this process, as it does not affect a laboratory's ability to analyze and report to the department.

d. Correction of deficiencies.

(1) If a laboratory failed to analyze a PE sample within acceptance limits, the laboratory has 60 days from receipt of the notification of the failure to identify and correct the problem to the department's satisfaction, and analyze a second PE sample. If the laboratory fails to analyze this second sample within acceptance limits and has had acceptable PE sample results within the last year, the department will downgrade the laboratory to "provisionally certified" status and notify the laboratory in writing.

(2) Once the department notifies a laboratory in writing that it has been downgraded to "provisionally certified" status, the laboratory must correct the problem within the following time frames, unless a written extension is obtained from the department. If the problem is not corrected, the laboratory is subject to suspension or revocation for that analyte, related analytical series, environmental program area, or the entire laboratory.

1. Unacceptable PE sample result within two months of notification.

2. Procedural deficiency within three months of notification.

3. Administrative deficiency within three months of notification.

4. Minor equipment deficiency within three months of notification. Examples of a minor equipment deficiency are inadequate analytical balances or incubators.

(3) The laboratory shall review the problems cited and, within the time period designated by the department, specify in writing to the department the corrective actions being taken, including an appropriate implementation schedule. The department shall consider the adequacy of the response and notify the laboratory of its certification status in a timely basis by mail, and may follow up to ensure corrective actions have been taken.

e. Reinstatement. Certification will be reinstated when the laboratory can demonstrate that all conditions for laboratory certification have been met to the satisfaction of the department and that the deficiencies which resulted in provisional certification status have been corrected. This may include an on-site visit, successful analysis of PE samples, or any other measure that the department deems appropriate.

83.7(3) Suspended certification criteria.

a. The department may downgrade certification to "suspended" status based on cause. The reasons for which a laboratory may be downgraded to "suspended" status include, but are not limited to, the following list.

(1) Failure to analyze a PE sample annually for water supply contaminants which pose an acute risk to human health, including nitrate, nitrite, and *Escherichia coli* bacteria, or which pose an imminent risk to the environment;

(2) Failure to analyze a PE sample annually within Iowa acceptance limits for water supply contaminants which pose an acute risk to human health, including nitrate, nitrite, and *Escherichia coli* bacteria, or which pose an imminent risk to the environment;

(3) Failure to correct previously identified deficiencies, which resulted in "provisional" certification status, within the prescribed time frames of 83.7(2) "d";

(4) Failure to analyze a PE sample within Iowa acceptance limits when there is not a reliable history of successful PE sample analysis within the past 12 months;

(5) Failure to satisfy the department that the laboratory is producing accurate data.

b. Administrative penalty. The department may assess an administrative penalty for a laboratory's failure to comply with the laboratory certification or reporting requirements.

c. Emergency certification suspension. The department may suspend certification without providing notice and opportunity to the laboratory to be heard if the department finds that the public health, safety, or welfare imperatively requires emergency action, and incorporates a finding to that effect in its administrative order, pursuant to 561—subrule 7.16(6).

83.7(4) Suspended certification procedure.

a. Notification to the laboratory. If a laboratory is subject to downgrading to “suspended” status on the basis of 83.7(3), the department will notify the laboratory or owner in writing of its intent to suspend certification in accordance with 561—7.16(17A,455A). Certification may be suspended for an analyte, a related analytical series, an environmental program area, or the entire laboratory.

b. Reporting. Once the suspension is effective, a laboratory must immediately discontinue analysis and reporting of compliance samples, may not analyze or report samples for compliance with departmental standards, and must notify the laboratory’s Iowa regulated clientele and other state certifying agencies of the change of the laboratory certification status. Any results generated during the period of suspension may not be used for compliance purposes by the department.

c. Right to appeal.

(1) The laboratory may appeal this decision by filing a written notice of appeal and request an administrative hearing with the department director within 30 days of receipt of the notice of suspension of certification. Contested case procedures under 561—Chapter 7 shall govern administration of the appeal.

The appeal must identify the specific portion(s) of the department action being appealed and be supported with a statement of the reason(s) for the challenge and must be signed by a responsible official from the laboratory such as the president or owner for a commercial laboratory, or the laboratory supervisor in the case of a municipal laboratory, or the laboratory director for a state laboratory.

(2) If no timely notice of appeal is filed, suspension is effective 30 days after receipt of the notice of suspension unless an emergency suspension order is in effect.

d. Correction of deficiencies.

(1) If a laboratory failed to analyze a PE sample within acceptance limits, the laboratory has 30 days from receipt of the notification of the failure to identify and correct the problem to the department’s satisfaction. If the laboratory fails to analyze this second sample within acceptance limits, the department will downgrade the laboratory to “suspended” status and notify the laboratory in writing.

(2) Once the department notifies a laboratory in writing that it has been downgraded to suspended status, the laboratory must correct the problem within the following timetable, unless a written extension is obtained from the department. If the problem is not corrected, the laboratory is subject to revocation for that analyte, related analytical series, environmental program area, or the entire laboratory.

1. Unacceptable PE sample result within two months of notification.

2. Procedural deficiency within three months of notification.

3. Administrative deficiency within three months of notification.

4. Minor equipment deficiency within three months of notification. Examples of a minor equipment deficiency are inadequate analytical balances or incubators.

5. Major equipment deficiency within six months of notification. An example of a major equipment deficiency would be the inability of existing complex analytical equipment to produce acceptable results, such as a chromatograph or spectrophotometer.

(3) The laboratory shall review the problems cited and, within the time period designated by the department, specify in writing to the department the corrective actions being taken including an appropriate implementation schedule. The department shall consider the adequacy of the response and notify the laboratory of its certification status in a timely basis by mail, and may follow up to ensure that corrective actions have been taken.

e. Reinstatement.

(1) Fee.

1. The laboratory will not be required to pay an additional fee if recertification affects an analyte or related analytical series, provided that:

- The laboratory is currently certified for other analytes, or

- A fee was paid within the two-year certification period for that related analytical series and the laboratory is certified for other parameters within that related analytical series.

2. A fee will be required if suspension affects a related analytical series effectively deleting that fee group from certification (such as all microbiological parameters in SDWA-MICRO), an environmental program area, or the entire laboratory. A fee will also be required if an additional on-site visit is required.

(2) Certification will be reinstated when the laboratory can demonstrate that all conditions for laboratory certification have been met to the department's satisfaction and, in particular, that the deficiencies which produced the suspension have been corrected. This may include an on-site visit, successful analysis of unknown samples, or any other measure that the department deems appropriate.

83.7(5) *Revoked certification criteria.*

a. The department may revoke certification for cause. The reasons for which a laboratory's certification may be revoked include, but are not limited to, the following:

- (1) For laboratories of any status, failure to analyze a PE sample within Iowa acceptance limits;
- (2) Failure to satisfy the department that the laboratory has corrected deficiencies identified during the on-site visit within three months for a procedural or administrative deficiency or within six months for an equipment deficiency;
- (3) Submission of a PE sample to another laboratory for analysis and reporting the data as its own;
- (4) Falsification of data or other deceptive practices;
- (5) Failure to use required analytical methodology for analyses submitted to the department;
- (6) Failure to satisfy the department that the laboratory is maintaining the required standard of quality based on the on-site visit;
- (7) Persistent failure to report compliance data to the regulated client or the department in a timely manner, thereby preventing compliance with state regulations and endangering public health;
- (8) Subverting compliance with state regulations by actions such as changing the sample type for a noncompliance sample to a compliance sample after its submission to the laboratory, allowing compliance samples to be changed to other noncompliance sample types, or selective reporting of split sample results; or
- (9) For laboratories certified through a reciprocal agreement with another state or third-party accreditation program, loss of certification in either the resident state or third-party accreditation program is cause for immediate revocation of certification in Iowa for the same parameters or program areas for which certification was lost.

b. The department may either downgrade or revoke certification based on cause.

c. Emergency revocation. The department may revoke certification without providing notice and opportunity to the laboratory to be heard if the department finds that the public health, safety, or welfare imperatively requires emergency action, and incorporates a finding to that effect in its administrative order, pursuant to 561—subrule 7.16(6).

d. Laboratory-requested revocation. The department may revoke certification upon receipt of a written request by the certified laboratory for removal from the certification program.

83.7(6) *Revoked certification procedure.*

a. Notification to the laboratory. Except for the instance when the laboratory voluntarily requests revocation in 83.7(5)“d,” if a laboratory is subject to revocation on the basis of 83.7(5), the department will notify the party in writing of its intent to revoke certification in accordance with 561—7.16(17A,455A). Certification may be revoked for an analyte, a related analytical series, an environmental program area, or the entire laboratory.

b. Reporting. Once revocation is effective, a laboratory must immediately discontinue analysis and reporting of compliance samples, shall not analyze or report samples for compliance with departmental standards, and must notify the laboratory's Iowa-regulated clientele and other state certifying agencies of the change of the laboratory certification status within three business days of receipt of the final notice. Any results generated after revocation may not be used for compliance purposes by the department.

c. Right to appeal. There is no appeal process for revocation of an analyte or a related analytical series unless the analyte(s) represents an entire environmental program area, such as underground storage tank parameters, or the entire laboratory. When the laboratory requests revocation pursuant to 83.7(5)“d,” the revocation will be issued promptly and will be effective immediately with no appeal process.

(1) For an environmental program area or for the entire laboratory, the laboratory may appeal this decision by filing a written notice of appeal and request for an administrative hearing with the department

director within 30 days of receipt of the notice of revocation of certification. Contested case procedures under 561—Chapter 7 shall govern further administration of the appeal.

The appeal must identify the specific portion(s) of the department action being appealed and be supported with a statement of the reason(s) for the challenge and must be signed by a responsible official from the laboratory such as the president or owner for a commercial laboratory, or the laboratory supervisor in the case of a municipal laboratory, or the laboratory director for a state laboratory.

(2) If no timely notice of appeal is filed within the 30-day time period, revocation is effective 30 days after receipt of the notice of intent.

d. Reinstatement. A laboratory which has had its certification revoked may apply for certification in accordance with 567—83.3(455B) once the deficiencies have been corrected.

[ARC 3735C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code sections 455B.113 through 455B.115.

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¹ Effective date of 42.2(1)“b”(9) and (10) delayed 70 days by the Administrative Rules Review Committee at its meeting held November 10, 1992.

² Effective date of Ch 83 delayed 70 days by the Administrative Rules Review Committee at its meeting held May 14, 1996.

CHAPTER 111
ANNUAL REPORTS OF SOLID WASTE ENVIRONMENTAL MANAGEMENT SYSTEMS

567—111.1(455J) Purpose. This chapter establishes methods and criteria for determining whether a planning area's or service area's environmental management system is in compliance with the provisions of Iowa Code section 455J.3.

[ARC 0041C, IAB 3/21/12, effective 4/25/12]

567—111.2(455J) Role of the department. Pursuant to Iowa Code subsection 455J.4(2), the department is responsible for the development and implementation of these rules.

[ARC 0041C, IAB 3/21/12, effective 4/25/12]

567—111.3(455J) Applicability. This chapter applies to those planning and service areas that have been designated as environmental management systems and that seek to continue to be so designated. This is a voluntary program, and planning and service areas may elect to leave the program at any time. Upon leaving the program, the planning or service area shall comply with the comprehensive planning requirements in 567—Chapter 101.

[ARC 0041C, IAB 3/21/12, effective 4/25/12]

567—111.4(455J) Definitions. For the purposes of this chapter, the following definitions apply:

“Annual report” means the required submittal to the department that documents an environmental management system's compliance with the requirements of Iowa Code section 455J.3.

“Aspect” means an element of a planning or service area's activities or operations that can interact with the environment.

“Audit” means a planned, objective and documented assessment, either done internally by the program participant or its designee or externally by an independent third party, to determine the performance of a planning or service area's system in relation to the designation requirements.

“Department” means the department of natural resources.

“Environmental management system” or *“EMS”* means the same as defined in Iowa Code section 455J.2(5).

“Environmental policy” means a statement by the planning or service area that includes:

1. The planning or service area's intentions and principles in relation to its overall environmental performance, which provides a framework for action and for setting environmental objectives and targets; and
2. The planning or service area's commitment to environmental compliance and continuous improvement.

“Fenceline” means the geographic area and the operations, facilities, and programs that the planning or service area has the ability to influence.

“Impact” means any change to the environment, whether adverse or beneficial, from an aspect of a planning or service area's activities or operations.

“Objective” means an overall and quantifiable environmental goal arising from the planning or service area's environmental policy.

“Plan component” means each of the six areas that are required to be addressed in an environmental management system, including: organics waste management, hazardous household materials collection, water quality improvement, greenhouse gas reduction, recycling services, and environmental education.

“Planning area” means the same as defined in rule 567—100.2(455B,455D).

“Service area” means that portion of a planning area that has been identified by the planning area to be a participant in the program. Only the service area is eligible for the program incentives described in Iowa Code section 455J.5.

“Target” means a detailed and quantifiable performance requirement that must be set and met in order to achieve the environmental objective. An objective may have several targets.

[ARC 0041C, IAB 3/21/12, effective 4/25/12; ARC 2756C, IAB 10/12/16, effective 11/16/16; ARC 3736C, IAB 4/11/18, effective 5/16/18]

567—111.5(455J) Submittal of annual reports. Annual reports shall be submitted to the department by September 1 of each year and include all the requirements in 567—111.6(455J). Annual reports shall address activities that occurred during the previous state fiscal year that ended June 30. The reports shall be submitted on a form provided by the department.

[ARC 0041C, IAB 3/21/12, effective 4/25/12]

567—111.6(455J) Contents of annual reports. The following elements shall be included in the annual report.

111.6(1) Executive summary. The executive summary shall include an overview of the environmental improvements and benefits achieved during the past year as related to the system's objectives and targets. This summary would be similar to what is presented for management review.

111.6(2) Environmental policy statement. The annual report shall include a copy of the planning or service area's environmental policy statement and the date it was last reviewed and, if appropriate, revised. A copy of the communication procedure or other documents describing how the environmental policy statement has been conveyed to staff, management, and other individuals having a formal role in the implementation of the EMS shall also be included.

111.6(3) Aspects and impacts. The annual report shall identify and evaluate the actual or potential significant aspects and impacts to the environment, whether adverse or beneficial, from the planning or service area's activities, services and facilities. A description of the significant impacts to the environment that have been determined and the methodology used for this determination shall be included. Any changes that occurred or may occur in the near future that are likely to affect the identified impacts in the coming year shall be described. Such changes may include, but are not limited to, the closure or opening of facilities, other changes to the EMS's fenceline, the initiation of major new programs, and the discontinuation of a major service.

111.6(4) Legal and other requirements. The annual report shall list the legal requirements for the planning or service area's operations and facilities included in its EMS fenceline, including but not limited to, relevant environmental laws, regulations and permits, and worker health and safety regulations. A process for tracking any changes in these requirements shall be described. A brief summary of the planning area's regulatory compliance performance for the previous year, including a listing of recurring or significant violations related to the identified legal requirements and how they were or are being resolved, shall be included.

111.6(5) Objectives and targets. The annual report shall describe the objective(s) relevant to each of the six plan components and the targets established for achieving the objective(s).

111.6(6) Action plan. The annual report shall provide a plan that describes the actions necessary to achieve the objectives and targets. The plan includes the identification of specific tasks, timelines for completion of each step in the plan, and a schedule for periodically reviewing and updating, as conditions dictate, the objectives and targets.

111.6(7) Roles and responsibilities. The annual report shall include identification and documentation of individuals and organizations responsible for specific tasks to carry out the objectives.

111.6(8) Communication and training. The annual report shall describe the processes that have been established for internal and external communication.

a. External communication includes reaching out to those groups and organizations that have been identified as having an interest, stake, or role in the planning or service area's ongoing EMS program. There shall also be procedures for receiving and responding to relevant communication from external interested parties.

b. Internal communication is directed to individuals, organizations and entities that have a role or responsibility within the action plan. Internal communication includes a process to ensure that all responsible parties are familiar with the EMS and have the training necessary to capably execute their roles. A description of the training provided to responsible parties shall be included.

111.6(9) Monitoring and measurement. The annual report shall describe the documented process for monitoring key activities and, at a minimum, measuring performance related to each objective and target.

111.6(10) Audit/assessment. The annual report shall provide documented procedures for assessing the performance of the component's action plan(s) in terms of achieving the stated objectives and targets and conformance with the overall EMS. The assessment shall draw conclusions from the performance measurements.

a. Internal audit. A copy of the result of the latest internal audit that includes the date(s) it was conducted and the identity of the auditor(s) shall be provided as part of the report. An internal audit shall be conducted each state fiscal year.

b. External audit. An external audit shall occur each state fiscal year. The date of the latest external audit or the date the audit will take place, along with the identity and pertinent qualifications of the independent, third-party auditor(s), shall be provided. The results of the external audit shall be incorporated into the report. The department has a requalification process for external auditors.

111.6(11) Reevaluation and modification. Reevaluation and modification are activities that allow a planning or service area to improve and strengthen the EMS on an ongoing basis. The annual report shall describe areas where the EMS has met, exceeded, or failed to meet expectations. For each plan component, the report shall identify root causes of those outcomes and develop revised goals and activities appropriate to each.

[ARC 0041C, IAB 3/21/12, effective 4/25/12; ARC 3736C, IAB 4/11/18, effective 5/16/18]

567—111.7(455J) Evaluation criteria. Each annual report shall be reviewed by the department, and a determination as to whether a planning or service area's EMS is in compliance with Iowa Code section 455J.3 shall be made by January 1 of each year. Reports shall be reviewed for the following:

1. Completeness in terms of addressing all of the elements set forth in 567—111.6(455J).
2. Progress toward achieving the objectives and targets set forth in the EMS.
3. Clear demonstration of continuous improvement in terms of progress toward achieving the objectives and targets set forth in the EMS.

Upon achievement of these objectives and targets, a reevaluation and decision will be needed to verify whether a new target should be assigned to an objective or, if the objectives and targets were not achieved, what new initiatives should be incorporated into the EMS. Planning and service areas shall review procedures on a regular basis and revise as appropriate.

[ARC 0041C, IAB 3/21/12, effective 4/25/12; ARC 3736C, IAB 4/11/18, effective 5/16/18]

567—111.8(455J) Evaluation outcomes.

111.8(1) If the department determines that the annual report adequately demonstrates compliance with the requirements of Iowa Code section 455J.3, the planning or service area shall remain designated as an EMS and shall continue to be qualified for the incentives set forth in Iowa Code section 455J.5.

111.8(2) If the department determines that the annual report clearly demonstrates that the planning or service area's EMS is no longer in compliance with Iowa Code section 455J.3, the department may recommend to the environmental protection commission the revocation of the EMS designation. If the commission concurs with the department's recommendation, the planning or service area shall adhere to the comprehensive planning requirements in 567—Chapter 101.

111.8(3) Failure by a planning or service area to submit an annual report by September 1 in any year will result in revocation of the EMS designation, following which the planning or service area shall adhere to the comprehensive planning requirements in 567—Chapter 101.

[ARC 0041C, IAB 3/21/12, effective 4/25/12; ARC 3736C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code section 455J.4.

[Filed ARC 0041C (Notice ARC 9919B, IAB 12/14/11), IAB 3/21/12, effective 4/25/12]

[Filed ARC 2756C (Notice ARC 2630C, IAB 7/20/16), IAB 10/12/16, effective 11/16/16]

[Filed ARC 3736C (Notice ARC 3569C, IAB 1/17/18), IAB 4/11/18, effective 5/16/18]

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Rules of divisions under this department “umbrella” include Professional Licensure[645], Dental Board[650], Medical Board[653],
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EARLY HEARING DETECTION AND INTERVENTION (EHDI) PROGRAM

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CHAPTER 3
EARLY HEARING DETECTION AND INTERVENTION (EHDI) PROGRAM

EARLY HEARING DETECTION AND INTERVENTION (EHDI) PROGRAM

641—3.1(135) Definitions. For the purposes of this chapter, the following definitions will apply:

“Applicant” means a child for whom assistance under this program is being requested.

“Area education agency” or *“AEA”* means an intermediate educational unit created by Iowa Code chapter 273.

“Audiologist” means a person licensed pursuant to Iowa Code chapter 147 or certified by the Iowa board of educational examiners pursuant to 282—15.3(272) or a person appropriately licensed in the state where the person practices.

“Audiology assistant” means a person who works under the supervision of an Iowa-licensed speech pathologist or audiologist, does not meet the requirements to be licensed as a speech pathologist or audiologist, and meets the minimum requirements set forth in 645—Chapter 300.

“Audiometrist” means a technician who has received special training in the use of pure-tone audiometry equipment. An audiometrist conducts the hearing tests selected and interpreted by an audiologist, who supervises the process.

“Birth center” means *“birth center”* as defined in Iowa Code section 135.61.

“Birthing hospital” means a private or public hospital licensed pursuant to Iowa Code chapter 135B that has a licensed obstetric unit or is licensed to provide obstetric services.

“Congenital cytomegalovirus” or *“cCMV”* means an infection where cytomegalovirus is transmitted to the fetus in the prenatal period.

“Contractor” means the entity selected by the department to act as third-party administrator for claims payment related to hearing aids and audiologic services for children.

“Cytomegalovirus” or *“CMV”* means a kind of herpes virus that usually produces very mild symptoms in an infected person but may cause severe neurological damage in a person with a weakened immune system and in a newborn.

“Department” means the Iowa department of public health.

“Diagnostic audiologic assessment” means physiologic or behavioral procedures completed by an audiologist to evaluate and diagnose hearing loss.

“Discharge” means a release from a birthing hospital to the parent or legal guardian of the child.

“Early ACCESS” means Iowa’s Individuals with Disabilities Education Act (IDEA), Part C, program for infants and toddlers. It is a statewide, comprehensive, interagency system of integrated early intervention services that supports eligible children and their families as defined in 281—Chapter 120.

“Early hearing detection and intervention advisory committee” or *“EHDI advisory committee”* means the committee appointed by the department to advise the director of the department regarding issues related to hearing health care for children and to make recommendations about the design and implementation of the early hearing detection and intervention program.

“Guardian” means a person who is not the parent of a minor child, but who has legal authority to make decisions regarding life or program issues for the child. A guardian may be a court or a juvenile court. “Guardian” does not mean conservator, as defined in Iowa Code section 633.3, although a person who is appointed to be a guardian may also be appointed to be a conservator.

“Health care professional” means a licensed physician, nurse practitioner, physician assistant, certified midwife, registered nurse, licensed practical nurse, patient care technician, certified nursing assistant, licensed audiologist, audiology assistant, audiometrist, hearing aid specialist, speech-language pathologist or other licensed or certified professional for whom hearing screening is within the professional’s scope of practice.

“Hearing loss” means a permanent unilateral or bilateral hearing loss of greater than 30 dB HL in the frequency region important for speech recognition (500-4000 Hz).

“*Hearing screening*” means a physiological measurement of hearing of a newborn or infant with a “pass” or “refer” result. Screening is used to determine the newborn’s or infant’s need for further testing and must be performed bilaterally, when applicable.

“*Initial screening*” or “*newborn hearing screening*” means a screening performed in a birthing hospital, birth center or facility other than a birthing hospital within the first month of life.

“*Newborn hearing screening*” means a physiological test to separate those newborns with normal hearing from those newborns who may have hearing thresholds of greater than 30 dB HL in either ear in the frequency region important for speech recognition (500-4000 Hz).

“*Normal hearing*” means hearing thresholds in both ears of 30 dB HL or less in the frequency region important for speech recognition (500-4000 Hz).

“*Parent*” means:

1. A biological or adoptive parent of a child;
2. A guardian, but not the state if the child is a ward of the state;
3. A person acting in the place of a parent, such as a grandparent or stepparent with whom a child lives, or a person who is legally responsible for the child’s welfare;
4. A surrogate parent who has been assigned in accordance with 281—120.68(34CFR303); or
5. A foster parent, if:
 - A biological parent’s authority to make the decisions required of parents under state law has been terminated; and
 - The foster parent has an ongoing, long-term parental relationship with the child; is willing to make the decisions required of a parent; and has no interest that would conflict with the interests of the child.

“*Physician*” means an individual licensed under Iowa Code chapter 148, 150, or 150A.

“*Primary care provider*” means a licensed physician, nurse practitioner, physician assistant or certified midwife who undertakes primary pediatric care responsibility for an infant or child to provide ongoing medical care and referrals to promote overall health and well-being.

“*Protocol*” means a document which guides decision making and provides the criteria to be used regarding screening, diagnosis, management, and treatment of children related to hearing health care. Early hearing detection and intervention protocols not otherwise specified in this chapter are available on the department’s website at www.idph.iowa.gov.

“*Provider*” means a licensed audiologist, otolaryngologist or hearing aid specialist who agrees to provide hearing aids or audiologic services to eligible patients.

“*Rescreen*” means a newborn hearing screening performed after two weeks of age on an infant who did not pass the initial screening.

“*Resident*” means an individual who is a legal resident of the state of Iowa.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16; ARC 3745C, IAB 4/11/18, effective 5/16/18]

641—3.2(135) Purpose. The overall purpose of this chapter is to establish administrative rules in accordance with Iowa Code section 135.131 relative to the following:

1. Universal hearing screening of all newborns and infants in Iowa.
2. Facilitating the transfer of data to the department to enhance the capacity of agencies and practitioners to provide services to children and their families.
3. Establishing procedures for infants who were not screened or do not pass their initial hearing screening to receive appropriate follow-up to determine if the infants have normal hearing or have hearing loss.
4. Establishing the procedure for distribution of funds to support the purchase of hearing aids and audiologic services for children.
5. Establishing the procedure for documentation of parent refusal of newborn testing for congenital cytomegalovirus.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16; ARC 3745C, IAB 4/11/18, effective 5/16/18]

641—3.3(135) Goal and outcomes. The goal of universal hearing screening of all newborns and infants in Iowa is early detection of hearing loss to allow children and their families the earliest possible opportunity to obtain appropriate early intervention services.
[ARC 8232B, IAB 10/7/09, effective 11/11/09]

641—3.4(135) Program components.

3.4(1) The EHDI coordinator assigned within the department provides administrative oversight, including follow-up activities, for the EHDI program within Iowa.

3.4(2) The EHDI advisory committee represents the interests of the people of Iowa and assists in the development of programming that ensures the availability and access to quality hearing health care for Iowa children.

3.4(3) The EHDI program has an association with the Iowa Title V maternal and child health programs to promote comprehensive services for infants and children with special health care needs.

3.4(4) The EHDI program provides hearing screening surveillance and follow-up for infants and children under the age of three. Follow-up may include:

a. Contact with the parent or legal guardian of an infant who was not screened or does not pass the initial hearing screening, outpatient hearing screening or diagnostic audiologic assessment.

b. Contact with the infant's primary care provider to ensure the infant receives appropriate follow-up no later than the recommended time line as outlined in the Joint Committee on Infant Hearing position statement at www.jcih.org.

c. Contact with the birthing hospital or health care professional for inquiries on missing results, data entry discrepancies and recommendations for additional referrals.

d. Referrals to family support or early intervention service providers for infants or toddlers diagnosed with a hearing loss.

e. Technical assistance to birthing facilities, primary care providers and health care professionals regarding best practices related to newborn hearing screening, diagnosis and follow-up best practices.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.5(135) Screening the hearing of all newborns. All newborns and infants born in Iowa, except those born with a condition that is incompatible with life, shall be screened for hearing loss. The person required to perform the screening shall use at least one of the following procedures:

1. Automated or screening auditory brainstem response, or

2. Evoked otoacoustic emissions.

[ARC 8232B, IAB 10/7/09, effective 11/11/09]

641—3.6(135) Procedures required of birthing hospitals. Each birthing hospital in Iowa shall follow these procedures:

3.6(1) Each birthing hospital shall designate an employee of the hospital to be responsible for the newborn hearing screening program in that institution. If a birthing hospital contracts with a third party for newborn screening services, the hospital retains ultimate responsibility for screening and reporting.

3.6(2) Prior to the discharge of the newborn, each birthing hospital shall provide hearing screening to every newborn delivered in the hospital, except in the following circumstances:

a. The newborn is transferred for acute care prior to completion of the hearing screening.

b. The newborn is born with a condition that is incompatible with life.

3.6(3) If a newborn is transferred for acute care, the birthing hospital shall notify the receiving facility of the status of the hearing screening. The receiving facility shall then be responsible for completion of the newborn hearing screening prior to discharge of the newborn from the nursery.

3.6(4) Newborn hearing screening shall be performed by a health care professional.

3.6(5) The birthing hospital shall report newborn hearing screening results to the parent or guardian in written form.

3.6(6) The birthing hospital shall report newborn hearing screening results to the department pursuant to 641—3.9(135).

3.6(7) The birthing hospital shall report the results of the hearing screening to the primary care provider of the newborn or infant upon the newborn's or infant's discharge from the birthing hospital. If the newborn or infant was not tested prior to discharge, the birthing hospital shall report the status of the hearing screening to the primary care provider of the newborn or infant.

3.6(8) The birthing hospital shall follow the hearing screening protocols prescribed by the department.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.7(135) Procedures required of birth centers. Each birth center in Iowa shall follow these procedures:

3.7(1) Each birth center shall designate an employee of the birth center to be responsible for the newborn hearing screening program in that institution.

3.7(2) Prior to discharge of the newborn, each birth center shall refer every newborn delivered in the birth center to a health care professional for a newborn hearing screening. Before discharge of the newborn, the birth center shall arrange an appointment for the newborn hearing screening no more than 15 days from the date of discharge and report the appointment time, date and location to the parent.

3.7(3) The health care professional to whom the newborn is referred for screening shall complete the screening within 30 days of the newborn's discharge from the birth center, unless the parent fails to attend the appointment. If the parent fails to attend the appointment, the health care professional shall document such failure in the medical or educational record and shall report such failure to the department.

3.7(4) The health care professional who completes the newborn hearing screening shall report screening results to the parent in written form.

3.7(5) The health care professional who completes the newborn hearing screening shall report screening results to the department pursuant to 641—3.9(135).

3.7(6) The health care professional who completes the newborn hearing screening shall report the results of the hearing screening to the primary care provider of the newborn or infant.

3.7(7) The person who completes the screening shall follow the hearing screening protocols prescribed by the department.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.8(135) Procedures to ensure that children born in locations other than a birth center or birthing hospital receive a hearing screening.

3.8(1) The primary care provider who undertakes primary pediatric care of a newborn delivered in a location other than a birthing hospital or birth center shall refer the newborn to a health care professional for completion of the newborn hearing screening no later than one month of age. The health care professional shall arrange an appointment for the newborn hearing screening and report to the parent the appointment time, date, and location.

3.8(2) The health care professional who completes the newborn hearing screening shall report screening results to the parent in written form.

3.8(3) The health care professional who completes the newborn hearing screening shall report screening results to the department pursuant to 641—3.9(135). If the parent fails to attend the appointment, the facility shall document such failure in the medical or educational record and shall report such failure to the department.

3.8(4) The health care professional who completes the newborn hearing screening shall report the results of the hearing screening to the primary care provider of the newborn or infant.

3.8(5) The person who completes the newborn hearing screening shall follow the hearing screening protocols prescribed by the department.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.9(135) Reporting hearing screening results and information to the department and child's primary care provider. Any birthing hospital, birth center, physician, audiologist or other health care professional required to report information pursuant to Iowa Code section 135.131 shall report all of the following information to the department relating to each newborn's hearing screening within six

working days of the birth of the newborn and within six working days of any hearing rescreen, utilizing the department's designated reporting system.

3.9(1) The name, date of birth, and gender of the newborn.

3.9(2) The name, address, and telephone number, if available, of the mother of the newborn. If the mother is not the person designated as legally responsible for the child's care, the name, address, and telephone number of the parent, as defined in 641—3.1(135), shall be reported.

3.9(3) The name of the primary care provider for the newborn upon the newborn's discharge from the birthing hospital or birth center.

3.9(4) The results of the newborn hearing screening, either "pass," "refer," or "not screened," for each ear separately.

3.9(5) The results of any rescreening, either "pass" or "refer," and the diagnostic audiologic assessment procedures used for each ear separately.

3.9(6) Known risk indicators for hearing loss of the infant or child.

3.9(7) If the parent fails to attend the appointment, the facility shall document such failure in the medical or educational record and shall report such failure to the department.

3.9(8) The person who completes the newborn hearing screening shall report the results of the hearing screening to the primary care provider of the infant or child.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.10(135) Conducting and reporting screening results and diagnostic audiologic assessments to the department and child's primary care provider. Any health care professional conducting newborn hearing screens, rescreens, or diagnostic audiologic assessments shall report the results within six working days for any child under three years of age to the department utilizing the department's designated reporting system. The health care professional shall conduct the diagnostic hearing assessment in accordance with the Pediatric Audiologic Diagnostic Protocol prescribed by the department at www.idph.iowa.gov. Results of a hearing screen, rescreen or diagnostic audiologic assessment shall be reported as follows.

3.10(1) Reports shall include:

- a. The name, date of birth, and gender of the child.
- b. The name, address, and telephone number, if available, of the mother of the child. If the mother is not the person designated as legally responsible for the child's care, the name, address, and telephone number of the parent, as defined in 641—3.1(135), shall be reported.
- c. The name of the primary care provider for the child.
- d. Known risk indicators for hearing loss.
- e. The date the child is fit with a hearing aid(s) or a cochlear implant(s), if applicable.
- f. The date of referral to early intervention, if applicable.
- g. The date of referral to family support, if applicable.

3.10(2) Results of the newborn hearing screening shall be reported as either "pass" or "refer" for each ear separately.

3.10(3) Results of the hearing rescreen shall be reported as either "pass" or "refer" for each ear separately.

3.10(4) If an assessment results in a diagnosis of normal hearing for both ears, this shall be reported.

3.10(5) Any diagnosis of hearing loss shall also be reported except for transient conductive hearing loss lasting for less than 90 days in the professional judgment of the practitioner. This exception will apply only if the child passed the initial hearing screening or rescreening or had a diagnostic assessment resulting in normal hearing for both ears.

3.10(6) Diagnostic audiologic assessment results shall include a statement of the severity (mild, moderate, moderately severe, severe, profound, or undetermined) and type (sensorineural, conductive, mixed, or undetermined) of hearing loss.

3.10(7) Any health care professional conducting newborn hearing screens, rescreens, or diagnostic audiologic assessments shall report the results to the primary care provider of the infant or child.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.11(135) Congenital cytomegalovirus (cCMV) testing for newborns who do not pass the initial newborn hearing screening. If the newborn hearing screen indicates potential hearing loss, as evidenced when a newborn does not pass the initial newborn hearing screening, the birthing hospital, birth center, physician, or other health care professional required to ensure that the hearing screening is performed shall do the following:

3.11(1) Test the newborn or ensure that the newborn is tested for cCMV before the newborn is 21 days of age.

3.11(2) Provide information to the parent of the newborn regarding the birth defects caused by cCMV and early intervention and treatment resources and services available for children diagnosed with cCMV.

3.11(3) If a parent objects to the testing, follow the procedures in 641—3.13(135).

This rule is intended to implement Iowa Code sections 135.131(9) “a” and 136A.5B.

[ARC 3745C, IAB 4/11/18, effective 5/16/18]

641—3.12(135) Sharing of information and confidentiality. Reports, records, and other information collected by or provided to the department relating to a child’s newborn hearing screening, rescreen, diagnostic audiologic assessment, and early intervention enrollment are confidential records pursuant to Iowa Code section 22.7.

3.12(1) Personnel of the department shall maintain the confidentiality of all information and records used in the review and analysis of newborn hearing screenings, rescreens, diagnostic audiologic assessments, and early intervention enrollment, including information which is confidential under Iowa Code chapter 22 or any other provisions of state law.

3.12(2) No individual or organization providing information to the department in accordance with this rule shall be deemed to be or held liable for divulging confidential information.

3.12(3) The department shall not release confidential information except to the following persons and entities under the following conditions:

a. The parent or guardian of an infant or child for whom the report is made.

b. A local birth-to-three coordinator with the Early ACCESS program or an agency under contract with the department to administer the children with special health care needs program.

c. A health care professional or primary care provider.

d. A representative of a federal or state agency, to the extent that the information is necessary to perform a legally authorized function of that agency.

e. A representative of a state agency, or an entity bound by that state, to the extent that the information is necessary to perform newborn hearing screening follow-up. The state agency or the entity bound by that state shall be subject to confidentiality regulations that are the same as or more stringent than those in the state of Iowa. The state agency or the entity bound by that state shall not use the information obtained from the department to market services to patients or nonpatients or identify patients for any purposes other than those expressly provided in this rule.

3.12(4) Research purposes. All proposals for research using the department’s data to be conducted by persons other than program staff shall first be submitted to and accepted by the researchers’ institutional review board. Proposals shall then be reviewed and approved by the department before research can commence.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16; ARC 3745C, IAB 4/11/18, effective 5/16/18]

641—3.13(135) Procedure to accommodate parental objection. These rules shall not apply if the parent objects to the hearing screening, diagnostic audiologic assessment, or cCMV testing.

3.13(1) If a parent objects to the screening, the birthing hospital, birth center, physician, or other health care professional shall obtain a written refusal from the parent or guardian on the department newborn hearing screening or diagnostic audiologic assessment refusal form and shall maintain the original copy of the written refusal in the newborn’s, infant’s or child’s medical record.

3.13(2) The birthing hospital, birth center, physician, or other health care professional shall send a copy of the written newborn hearing screening or diagnostic audiologic assessment refusal form to the department within six days of the birth of the newborn.

3.13(3) If a parent objects to a hearing rescreen or diagnostic audiologic assessment orally to a department EHDI staff member during follow-up, the staff member shall document the refusal in the department's designated reporting system and mail to the parent or guardian the department newborn hearing screening or diagnostic audiologic assessment refusal form in an attempt to obtain a written refusal to be maintained in the newborn's, infant's or child's medical record.

3.13(4) If a parent objects to cCMV testing, the birthing hospital, birth center, physician, or other health care professional required to ensure cCMV testing shall obtain, on the department cCMV testing refusal form, a written refusal from the parent or guardian, shall maintain the original copy of the written refusal in the child's medical record, and shall send a copy of the written refusal to the department within 21 days of the child's birth.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16; ARC 3745C, IAB 4/11/18, effective 5/16/18]

641—3.14(135) Civil/criminal liability. A person who acts in good faith in complying with these rules shall not be held civilly or criminally liable for reporting the information required.

[ARC 8232B, IAB 10/7/09, effective 11/11/09]

641—3.15(135) Early hearing detection and intervention advisory committee.

3.15(1) Membership. The membership of the advisory committee shall be geographically representative of stakeholders with an interest in and concern for newborn hearing screening and follow-up. The advisory committee shall be appointed by the department director and consist of no more than 25 members and include the state EHDI coordinator. The EHDI coordinator will assist in facilitation of committee meetings. Membership will include a minimum of one representative from each of the following areas:

- a. Advocate (e.g., office of deaf services).
- b. Audiology.
- c. Children with special health care needs program.
- d. Deaf/hard-of-hearing community.
- e. Early intervention services.
- f. Ears, nose and throat specialist/otolaryngologists.
- g. Family support.
- h. Iowa Hospital Association or designee.
- i. Hospitals (preferably hearing screening coordinator).
- j. Parent(s) of deaf or hard-of-hearing child.
- k. Family practice physician.
- l. Pediatrician.
- m. Representation from a state agency that is not the department.

3.15(2) Meetings. The committee shall meet three times per year. Location and times will be prescribed by the department.

3.15(3) Voting. The committee will make its recommendations by consensus. In the event that consensus cannot be reached within a reasonable time frame, there will be a majority rule, as in a simple majority of those present or more than 50 percent. At least 50 percent of the members must be present.

3.15(4) Service, vacancies and attendance.

a. Each committee member is appointed to serve a term of three years. Members may serve longer at the request of the department director unless their absence at meetings exceeds that permitted by the attendance policy. Terms for existing members will begin at the first of the year or as positions vacate. The term for a new member replacing a member before the member's term is up will begin when the vacancy is filled.

b. Vacancies will be filled within six months. The term will begin when the vacancy is filled. The EHDI coordinator will work with advisory committee members, EHDI program staff and associations to identify new members. Names and short biographies will be given to the department director to make a final determination for committee member vacancies.

c. Committee members are expected to be present in person for advisory committee meetings with the exception of extenuating circumstances that have been communicated to the state EHDI coordinator. Any member who cannot attend the scheduled meetings should notify the state EHDI coordinator at least 24 hours prior to the start of the regularly scheduled meeting. If there are extenuating circumstances and a member can send a representative, the member is encouraged to do so. Appointed members may be recommended for dismissal from the committee if the members miss more than two meetings per year. [ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.16 Reserved

HEARING AIDS AND AUDIOLOGIC SERVICES FUNDING PROGRAM

641—3.17(83GA, HF811) Eligibility criteria. The enrollment process to determine eligibility for services under this program includes the following requirements:

3.17(1) Age. Individuals are eligible from birth through 20 years of age.

3.17(2) Residency. Individuals must currently reside in Iowa.

3.17(3) The applicant must not be eligible for hearing aids or audiologic services under Title XIX or HAWK-I.

[ARC 8232B, IAB 10/7/09, effective 11/11/09]

641—3.18(83GA, HF811) Covered services.

3.18(1) Funding does not cover either the surgical costs associated with a cochlear or Baha implant or the cost of the devices.

3.18(2) Funding does not pay for services covered by insurance.

3.18(3) The following hearing aids and audiologic services may be provided through the hearing aids and audiologic services funding program:

1. Repair/modification of hearing aid
2. Hearing aid, monaural, behind the ear
3. Hearing aid dispensing fee, monaural
4. Hearing aid, binaural, in the ear
5. Hearing aid, binaural, behind the ear
6. Hearing aid dispensing fee, binaural
7. Hearing aid, bicros, glasses
8. Ear mold/insert, not disposable, any type
9. Battery for use in hearing aid
10. Hearing aid supplies, accessories
11. Assistive listening device, not otherwise specified
12. Assistive listening device, dispensing
13. Service handling charge
14. Service charge, ear mold
15. Annual charge, ear mold
16. Pure tone audiometry, air only
17. Pure tone audiometry, air and speech audiometry threshold
18. Speech audiometry threshold
19. Speech audiometry threshold with speech
20. Comprehensive audiometry threshold evaluation
21. Tympanometry (impedance testing)
22. Conditioning play audiometry
23. Auditory-evoked potentials for evoked response audiometry, comprehensive
24. Auditory-evoked potentials for evoked response audiometry, limited
25. Visual reinforcement audiometry
26. Evoked otoacoustic emissions, limited
27. Hearing aid examination and selection, monaural

28. Hearing aid examination and selection, binaural
29. Hearing aid check, monaural
30. Hearing aid check, binaural
31. Electroacoustic evaluation for hearing aid, monaural
32. Electroacoustic evaluation for hearing aid, binaural
33. Office/outpatient visit related to audiologic services
34. Consultations related to audiologic services

3.18(4) The department may elect to cover additional services not otherwise restricted in these rules.
[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.19(83GA, HF811) Application procedures.

3.19(1) A child, or the parent or guardian of a child, desiring hearing aids or audiologic services may apply to the contractor.

3.19(2) The following information shall be provided to the contractor by the applicant to be considered for eligibility under this program:

- a. Patient's first name, middle initial and last name.
- b. Patient's date of birth.
- c. Patient's address, including city, state and ZIP code.
- d. Parent/guardian's first name, middle initial and last name.
- e. Parent/guardian's telephone number.
- f. Parent/guardian's email address.
- g. Parent/guardian's or child's medical insurance plan coverage.
- h. Hearing aid/audiologic service provider name and telephone number.
- i. Whether the request is for hearing aids or audiologic services or both.
- j. Estimated service costs.

3.19(3) Applicants will be enrolled in the program on a first-come, first-served basis upon the date the application is received by the contractor.

3.19(4) The contractor will provide written notification to the applicant regarding determination of eligibility or noneligibility and the applicant's right to appeal a denial. For those applicants deemed eligible, an enrollee number will be assigned by the contractor.

3.19(5) An applicant must submit a renewal application form on an annual basis, accompanied by all information requested by the department.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.20(83GA, HF811) Hearing aids and audiologic services funding wait list.

3.20(1) If an applicant is eligible for hearing aid and audiologic services funding and sufficient funds are available to provide services to the applicant, the contractor shall enroll the applicant upon approval by the department. If the applicant is eligible for hearing aid and audiologic services funding and sufficient funds are not available to provide services to the applicant, the contractor upon approval by the department shall place the applicant's name on the hearing aid and audiologic services funding wait list in the order provided for in this rule.

3.20(2) The contractor, upon approval by the department, shall place names on the wait list in the following order:

- a. Applicants under the age of three diagnosed with a hearing loss who are in need of hearing aids.
- b. Applicants in need of hearing aids or audiologic services.
- c. All other applicants, who shall be placed on the wait list in chronological order based upon the date of receipt of a completed application by the contractor upon approval by the department.

[ARC 8232B, IAB 10/7/09, effective 11/11/09]

641—3.21(83GA, HF811) Reimbursement of providers.

3.21(1) To receive reimbursement for hearing aids and audiologic services, the provider must complete a provider information sheet and I-9 form provided by the department.

3.21(2) The provider must be a Title XIX provider.

3.21(3) Reimbursement of hearing aids and audiologic services will be paid directly to the provider based on Title XIX reimbursement rates.

- a. Bills will be adjusted accordingly by the department prior to payment.
- b. Reimbursement for hearing aids or supplemental hearing devices includes the costs of shipping and handling.

3.21(4) Hearing aids and audiologic services funding shall be the payor of last resort.

3.21(5) Payment through this funding source is considered payment in full for covered services. If a third party liability (TPL) payment equals or exceeds the Title XIX allowance, no further reimbursement is provided.

3.21(6) The provider shall submit bills after an enrollee number is assigned to the applicant and the audiologic service is provided or hearing aid is fitted.

3.21(7) The provider shall submit the following documents:

- a. Centers for Medicare and Medicaid Services Form CMS 1500. Forms will be furnished by the providers and will include the applicant's enrollee number in the upper right-hand corner of the form.
- b. Manufacturer's invoice for hearing devices as prescribed by the department.
- c. Applicant's explanation of benefits or documentation of a telephone contact made by the provider to the patient's private insurance company including: date of contact, name of insurance representative, name of insurance company, applicant's policy number and coverage limitations for hearing evaluations and devices.

[ARC 8232B, IAB 10/7/09, effective 11/11/09; ARC 2290C, IAB 12/9/15, effective 1/13/16]

641—3.22(83GA, HF811) Appeals. The department shall cause an applicant to be notified of the department's decision to approve or deny an application or to place an applicant on the child hearing aids and audiologic services wait list. In the event an applicant is dissatisfied with the department's decision, the applicant may submit a formal appeal in writing to the EHDI advisory committee. Such request shall be delivered in person or shall be mailed by certified mail, return receipt requested, to EHDI Advisory Committee, Iowa Department of Public Health, Lucas State Office Building, 321 E. 12th Street, Des Moines, Iowa 50319. Upon receipt of such an appeal, the EHDI advisory committee shall review the case and issue a written determination within 15 days of receipt of the request. The decision shall refer to the applicant by initials or other nonidentifying means. The EHDI advisory committee's decision shall be final and binding. This appeal process does not constitute a contested case proceeding as defined in Iowa Code chapter 17A.

[ARC 8232B, IAB 10/7/09, effective 11/11/09]

These rules are intended to implement Iowa Code section 135.131 as amended by 2009 Iowa Acts, House File 314, division II, and 2009 Iowa Acts, House File 811, division IV, section 60(2) "c."

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Appendix A
Pediatric Audiologic Diagnostic Protocol
Rescinded IAB 12/9/15, effective 1/13/16

CHAPTER 37
PHYSICAL PROTECTION OF CATEGORY 1 AND CATEGORY 2
QUANTITIES OF RADIOACTIVE MATERIAL

GENERAL PROVISIONS

641—37.1(136C) Purpose and scope.

37.1(1) This chapter has been established to provide the requirements for the physical protection program for any licensee that possesses an aggregated category 1 or category 2 quantity of radioactive material listed in Appendix A to this chapter. These requirements provide reasonable assurance of the security of category 1 or category 2 quantities of radioactive material by protecting these materials from theft or diversion. Specific requirements for access to material, use of material, transfer of material, and transport of material are included. No provision of this chapter authorizes possession of licensed material.

37.1(2) The divisions in this chapter entitled “Background Investigations and Access Control Program” and “Physical Protection Requirements During Use,” including rules 641—37.21(136C) to 641—37.57(136C), apply to any person who, under the regulations in this chapter, possesses or uses at any site an aggregated category 1 or category 2 quantity of radioactive material.

37.1(3) The division in this chapter entitled “Physical Protection in Transit,” including rules 641—37.71(136C) to 641—37.81(136C), applies to any person who, under the rules of this chapter:

- a. Transports or delivers to a carrier for transport in a single shipment a category 1 or category 2 quantity of radioactive material; or
- b. Imports or exports a category 1 or category 2 quantity of radioactive material; the provisions only apply to the domestic portion of the transport.

37.1(4) All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

[ARC 1479C, IAB 6/11/14, effective 7/16/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—37.2 to 37.4 Reserved.

641—37.5(136C) Definitions.

37.5(1) For the purposes of this chapter, these terms have the definitions set forth below.

“*Access control*” means a system for allowing only approved individuals to have unescorted access to the security zone and for ensuring that all other individuals are subject to escorted access.

“*Act*” means the Atomic Energy Act of 1954 (68 Stat. 919), as amended through July 16, 2014.

“*Agency*” means the Iowa department of public health.

“*Aggregated*” means accessible by the breach of a single physical barrier that would allow access to radioactive material in any form, including any devices that contain the radioactive material, when the total activity equals or exceeds a category 2 quantity of radioactive material.

“*Agreement state*” means any state with which the Atomic Energy Commission or the U.S. Nuclear Regulatory Commission has entered into an effective agreement under Subsection 274b. of the Act. “*Non-agreement state*” means any other state.

“*Approved individual*” means an individual whom the licensee has determined to be trustworthy and reliable for unescorted access in accordance with rules 641—37.21(136C) through 641—37.33(136C) and who has completed the training required by 37.43(3).

“*Background investigation*” means the investigation conducted by a licensee or applicant to support the determination of trustworthiness and reliability.

“*Becquerel (Bq)*” means one disintegration per second.

“*Byproduct material*” means:

1. Any radioactive material, except special nuclear material, yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material;
2. The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from

uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute “byproduct material” within this definition;

3. Any discrete source of radium-226 that is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; or any material that:

- Has been made radioactive by use of a particle accelerator; and
- Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and

4. Any discrete source of naturally occurring radioactive material, other than source material, that:

- The Nuclear Regulatory Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and

- Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

“*Carrier*” means a person engaged in the transportation of passengers or property by land or water as a common, contract, or private carrier, or by civil aircraft.

“*Category 1 quantity of radioactive material*” means a quantity of radioactive material meeting or exceeding the category 1 threshold in Table 1 of Appendix A to this chapter. This is determined by calculating the ratio of the total activity of each radionuclide to the category 1 threshold for that radionuclide and adding the ratios together. If the sum is equal to or exceeds 1, the quantity would be considered a category 1 quantity. Category 1 quantities of radioactive material do not include the radioactive material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet.

“*Category 2 quantity of radioactive material*” means a quantity of radioactive material meeting or exceeding the category 2 threshold but less than the category 1 threshold in Table 1 of Appendix A to this chapter. This is determined by calculating the ratio of the total activity of each radionuclide to the category 2 threshold for that radionuclide and adding the ratios together. If the sum is equal to or exceeds 1, the quantity would be considered a category 2 quantity. Category 2 quantities of radioactive material do not include the radioactive material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet.

“*Commission*” means the U.S. Nuclear Regulatory Commission or its duly authorized representatives.

“*Curie*” means that amount of radioactive material which disintegrates at the rate of 37 billion atoms per second.

“*Diversions*” means the unauthorized movement of radioactive material subject to this chapter to a location different from the material’s authorized destination inside or outside of the site at which the material is used or stored.

“*Escorted access*” means accompaniment while in a security zone by an approved individual who maintains continuous direct visual surveillance at all times over an individual who is not approved for unescorted access.

“*Fingerprint orders*” means the orders issued by the U.S. Nuclear Regulatory Commission or the legally binding requirements issued by agreement states that require fingerprints and criminal history records checks for individuals with unescorted access to category 1 and category 2 quantities of radioactive material or safeguards information-modified handling.

“*Government agency*” means any executive department, commission, independent establishment, corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the government.

“*License*” means a license issued by the agency in accordance with the rules adopted by the agency.

“*License-issuing authority*” means the licensing agency that issued the license, i.e., the agency, the U.S. Nuclear Regulatory Commission or an agreement state.

“Local law enforcement agency (LLEA)” means a public or private organization that has been approved by a federal, state, or local government to carry firearms and make arrests, and is authorized and has the capability to provide an armed response in the jurisdiction where the licensed category 1 or category 2 quantity of radioactive material is used, stored, or transported.

“Lost or missing licensed material” means licensed material whose location is unknown. Lost or missing licensed material includes material that has been shipped but has not reached its destination and whose location cannot be readily traced in the transportation system.

“Mobile device” means a piece of equipment containing licensed radioactive material that is either mounted on wheels or casters, or otherwise equipped for moving without a need for disassembly or dismounting; or designed to be hand carried. Mobile devices do not include stationary equipment installed in a fixed location.

“Movement control center” means an operations center that is remote from transport activity and that maintains position information on the movement of radioactive material, receives reports of attempted attacks or thefts, provides a means for reporting these and other problems to appropriate agencies and can request and coordinate appropriate aid.

“No-later-than arrival time” means the date and time that the shipping licensee and receiving licensee have established as the time at which an investigation will be initiated if the shipment has not arrived at the receiving facility. The no-later-than arrival time may not be more than six hours after the estimated arrival time for shipments of category 2 quantities of radioactive material.

“Person” means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, any other state or political subdivision or agency thereof, and any legal successor, representative, agent, or agency of the foregoing, but shall not include federal government agencies.

“Reviewing official” means the individual who shall make the trustworthiness and reliability determination of an individual to determine whether the individual may have, or continue to have, unescorted access to the category 1 or category 2 quantities of radioactive materials that are possessed by the licensee.

“Sabotage” means deliberate damage, with malevolent intent, to a category 1 or category 2 quantity of radioactive material, a device that contains a category 1 or category 2 quantity of radioactive material, or the components of the security system.

“Safe haven” means a readily recognizable and readily accessible site at which security is present or from which, in the event of an emergency, the transport crew can notify and wait for the local law enforcement authorities.

“Security zone” means any temporary or permanent area determined and established by the licensee for the physical protection of category 1 or category 2 quantities of radioactive material.

“State” means a state of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands.

“Telemetric position monitoring system” means a data transfer system that captures information by instrumentation or measuring devices, or both, about the location and status of a transport vehicle or package between the departure and destination locations.

“Trustworthiness and reliability” are characteristics of an individual considered dependable in judgment, character, and performance, such that unescorted access to category 1 or category 2 quantities of radioactive material by that individual does not constitute an unreasonable risk to the public health and safety or security. A determination of trustworthiness and reliability for this purpose is based upon the results from a background investigation.

“Unescorted access” means solitary access to an aggregated category 1 or category 2 quantity of radioactive material or the devices that contain the material.

“United States,” when used in a geographical sense, includes Puerto Rico and all territories and possessions of the United States.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.6 Reserved.

641—37.7(136C) Communications. All communications and reports concerning the rules in this chapter should be addressed to the agency at its office located at the Iowa Department of Public Health, Bureau of Radiological Health, Lucas State Office Building, 5th Floor, 321 East 12th Street, Des Moines, Iowa 50319.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.8 to 37.10 Reserved.

641—37.11(136C) Specific exemptions.

37.11(1) The agency may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the rules in this chapter as it determines are authorized by law and will not result in undue hazard to public health and safety or property and are otherwise in the public interest. Application for exemption should be made in accordance with 641—Chapter 178.

37.11(2) A licensee that possesses radioactive waste that contains category 1 or category 2 quantities of radioactive material is exempt from the requirements of this chapter. Except that any radioactive waste that contains discrete sources, ion-exchange resins, or activated material that weighs less than 2,000 kg (4,409 lbs) is not exempt from the requirements of this chapter. The licensee shall implement the following requirements to secure the radioactive waste:

- a. Use continuous physical barriers that allow access to the radioactive waste only through established access control points;
- b. Use a locked door or gate with monitored alarm at the access control point;
- c. Assess and respond to each actual or attempted unauthorized access to determine whether an actual or attempted theft, sabotage, or diversion occurred; and
- d. Immediately notify the LLEA and request an armed response from the LLEA upon determination that there was an actual or attempted theft, sabotage, or diversion of the radioactive waste that contains category 1 or category 2 quantities of radioactive material.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.12 to 37.20 Reserved.

BACKGROUND INVESTIGATIONS AND ACCESS CONTROL PROGRAM

641—37.21(136C) Personnel access authorization requirements for category 1 or category 2 quantities of radioactive material.

37.21(1) Each licensee that possesses an aggregated quantity of radioactive material at or above the category 2 threshold shall establish, implement, and maintain its access authorization program in accordance with the requirements of this chapter.

37.21(2) An applicant for a new license and each licensee that would become newly subject to the requirements of this chapter upon application for amendment of its license, and a licensee aggregating radioactive material to a quantity that equals or exceeds the category 2 threshold, shall implement the requirements of this chapter and be inspected by the agency, as appropriate, before a new license or license amendment will be issued.

37.21(3) The licensee's access authorization program must ensure that the individuals specified in 37.21(4) are trustworthy and reliable.

37.21(4) Applicability.

- a. Licensees shall subject the following individuals to an access authorization program:
 - (1) Any individual whose assigned duties require unescorted access to category 1 or category 2 quantities of radioactive material or to any device that contains the radioactive material; and
 - (2) Reviewing officials.

b. Licensees need not subject the categories of individuals listed in rule 641—37.29(136C) to the investigation elements of the access authorization program.

c. Licensees shall approve for unescorted access to category 1 or category 2 quantities of radioactive material only those individuals with job duties that require unescorted access to category 1 or category 2 quantities of radioactive material.

d. Licensees may include individuals needing access to safeguards information-modified handling under 10 CFR Part 73 in the access authorization program under these rules.
[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.22 Reserved.

641—37.23(136C) Access authorization program requirements.

37.23(1) Granting unescorted access authorization.

a. Licensees shall implement the requirements of these rules for granting initial or reinstated unescorted access authorization.

b. Individuals who have been determined to be trustworthy and reliable shall also complete the security training required by 37.43(3) before being allowed unescorted access to category 1 or category 2 quantities of radioactive material.

37.23(2) Reviewing officials.

a. Reviewing officials are the only individuals who may make trustworthiness and reliability determinations that allow individuals to have unescorted access to category 1 or category 2 quantities of radioactive materials possessed by the licensee.

b. Each licensee shall name one or more individuals to be reviewing officials. After completing the background investigation on the reviewing official, the licensee shall provide under oath or affirmation, a certification that the reviewing official is deemed trustworthy and reliable by the licensee. The fingerprints of the named reviewing official must be taken by a law enforcement agency, federal or state agencies that provide fingerprinting services to the public, or commercial fingerprinting services authorized by a state to take fingerprints. Every ten years, the licensee shall recertify that the reviewing official is deemed trustworthy and reliable in accordance with 37.25(3).

c. Reviewing officials must be permitted to have unescorted access to category 1 or category 2 quantities of radioactive materials or access to safeguards information or safeguards information-modified handling, if the licensee possesses safeguards information or safeguards information-modified handling.

d. Reviewing officials cannot approve other individuals to act as reviewing officials.

e. A reviewing official does not need to undergo a new background investigation before being named by the licensee as the reviewing official if:

(1) The individual has undergone a background investigation that included fingerprinting and an FBI criminal history records check and has been determined to be trustworthy and reliable by the licensee; or

(2) The individual is subject to a category listed in rule 641—37.29(136C).

37.23(3) Informed consent.

a. Licensees may not initiate a background investigation without the informed and signed consent of the subject individual. This consent must include authorization to share personal information with other individuals or organizations as necessary to complete the background investigation. Before a final adverse determination, the licensee shall provide the individual with an opportunity to correct any inaccurate or incomplete information that is developed during the background investigation. Licensees do not need to obtain signed consent from those individuals that meet the requirements of 37.25(2). A signed consent must be obtained prior to any reinvestigation.

b. The subject individual may withdraw the individual's consent at any time. Licensees shall inform the individual that:

(1) If an individual withdraws consent, the licensee may not initiate any elements of the background investigation that were not in progress at the time the individual withdrew consent; and

(2) The withdrawal of consent for the background investigation is sufficient cause for denial or termination of unescorted access authorization.

37.23(4) *Personal history disclosure.* Any individual who is applying for unescorted access authorization shall disclose the personal history information that is required by the licensee's access authorization program for the reviewing official to make a determination of the individual's trustworthiness and reliability. Refusal to provide, or the falsification of, any personal history information required by these rules is sufficient cause for denial or termination of unescorted access authorization.

37.23(5) *Determination basis.*

a. The reviewing official shall determine whether to permit, deny, unfavorably terminate, maintain, or administratively withdraw an individual's unescorted access authorization based on an evaluation of all of the information collected to meet the requirements of these rules.

b. The reviewing official may not permit any individual to have unescorted access until the reviewing official has evaluated all of the information collected to meet the requirements of these rules and determined that the individual is trustworthy and reliable. The reviewing official may deny unescorted access to any individual based on information obtained at any time during the background investigation.

c. The licensee shall document the basis for concluding whether or not there is reasonable assurance that an individual is trustworthy and reliable.

d. The reviewing official may terminate or administratively withdraw an individual's unescorted access authorization based on information obtained after the background investigation has been completed and the individual granted unescorted access authorization.

e. Licensees shall maintain a list of persons currently approved for unescorted access authorization. When a licensee determines that a person no longer requires unescorted access or meets the access authorization requirement, the licensee shall remove the person from the approved list as soon as possible, but no later than seven working days, and take prompt measures to ensure that the individual is unable to have unescorted access to the material.

37.23(6) *Procedures.* Licensees shall develop, implement, and maintain written procedures for implementing the access authorization program. The procedures must include provisions for the notification of individuals who are denied unescorted access. The procedures must include provisions for the review, at the request of the affected individual, of a denial or termination of unescorted access authorization. The procedures must contain a provision to ensure that the individual is informed of the grounds for the denial or termination of unescorted access authorization and allow the individual an opportunity to provide additional relevant information.

37.23(7) *Right to correct and complete information.*

a. Prior to any final adverse determination, licensees shall provide each individual subject to these rules with the right to complete, correct, and explain information obtained as a result of the licensee's background investigation. Confirmation of receipt by the individual of this notification must be maintained by the licensee for a period of one year from the date of the notification.

b. If, after reviewing the individual's criminal history record, an individual believes that it is incorrect or incomplete in any respect and wishes to change, correct, update, or explain anything in the record, the individual may initiate challenge procedures. These procedures include direct application by the individual challenging the record to the law enforcement agency that contributed the questioned information or a direct challenge as to the accuracy or completeness of any entry on the criminal history record to the Federal Bureau of Investigation, Criminal Justice Information Services (CJIS) Division, ATTN: SCU, Mod. D-2, 1000 Custer Hollow Road, Clarksburg, WV 26306, as set forth in 28 CFR 16.30 through 16.34. In the latter case, the Federal Bureau of Investigation (FBI) will forward the challenge to the agency that submitted the data, and will request that the agency verify or correct the challenged entry. Upon receipt of an official communication directly from the agency that contributed the original information, the FBI Identification Division will make any changes necessary in accordance with the information supplied by that agency. Licensees must provide at least ten days for an individual to initiate action to challenge the results of an FBI criminal history records check after the record is made

available for the individual's review. The licensee may make a final adverse determination based upon the criminal history records only after receipt of the FBI's confirmation or correction of the record.

37.23(8) Records.

a. The licensee shall retain documentation regarding the trustworthiness and reliability of individual employees for three years from the date the individual no longer requires unescorted access to category 1 or category 2 quantities of radioactive material.

b. The licensee shall retain a copy of the current access authorization program procedures as a record for three years after the procedure is no longer needed. If any portion of the procedure is superseded, the licensee shall retain the superseded material for three years after the record is superseded.

c. The licensee shall retain the list of persons approved for unescorted access authorization for three years after the list is superseded or replaced.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.24 Reserved.

641—37.25(136C) Background investigations.

37.25(1) Initial investigation. Before allowing an individual unescorted access to category 1 or category 2 quantities of radioactive material or to the devices that contain the material, licensees shall complete a background investigation of the individual seeking unescorted access authorization. The scope of the investigation must encompass at least the seven years preceding the date of the background investigation or since the individual's eighteenth birthday, whichever is shorter. The background investigation must include at a minimum:

a. Fingerprinting and an FBI identification and criminal history records check in accordance with rule 641—37.27(136C);

b. Verification of true identity. Licensees shall verify the true identity of the individual who is applying for unescorted access authorization to ensure that the applicant is who the applicant claims to be. A licensee shall review official identification documents (e.g., driver's license; passport; government identification; certificate of birth issued by the state, province, or country of birth) and compare the documents to personal information data provided by the individual to identify any discrepancy in the information. Licensees shall document the type, expiration, and identification number of the identification document, or maintain a photocopy of identifying documents on file in accordance with rule 641—37.31(136C). Licensees shall certify in writing that the identification was properly reviewed, and shall maintain the certification and all related documents for review upon inspection;

c. Employment history verification. Licensees shall complete employment history verification, including military history. Licensees shall verify the individual's employment with each previous employer for the most recent seven years before the date of application;

d. Verification of education. Licensees shall verify that the individual participated in the education process during the claimed period;

e. Character and reputation determination. Licensees shall complete reference checks to determine the character and reputation of the individual who has applied for unescorted access authorization. Unless other references are not available, reference checks may not be conducted with any person who is known to be a close member of the individual's family, including but not limited to the individual's spouse, parents, siblings, or children, or any individual who resides in the individual's permanent household. Reference checks under this rule must be limited to whether the individual has been and continues to be trustworthy and reliable;

f. The licensee shall also, to the extent possible, obtain independent information to corroborate that provided by the individual (e.g., seek references not supplied by the individual); and

g. If a previous employer, educational institution, or any other entity with which the individual claims to have been engaged fails to provide information or indicates an inability or unwillingness to provide information within a time frame deemed appropriate by the licensee but at least after ten business days of the request or if the licensee is unable to reach the entity, the licensee shall document the refusal,

unwillingness, or inability in the record of investigation and shall attempt to obtain the information from an alternate source.

37.25(2) Grandfathering.

a. Individuals who have been determined to be trustworthy and reliable for unescorted access to category 1 or category 2 quantities of radioactive material under the fingerprint orders may continue to have unescorted access to category 1 and category 2 quantities of radioactive material without further investigation. These individuals shall be subject to the reinvestigation requirement.

b. Individuals who have been determined to be trustworthy and reliable under the provisions of 10 CFR Part 73 or the security orders for access to safeguards information, safeguards information-modified handling, or risk-significant material may have unescorted access to category 1 and category 2 quantities of radioactive material without further investigation. The licensee shall document that the individual was determined to be trustworthy and reliable under the provisions of 10 CFR Part 73 or a security order. Security order, in this context, refers to any order that was issued by the NRC that required fingerprints and an FBI criminal history records check for access to safeguards information, safeguards information-modified handling, or risk-significant material such as special nuclear material or large quantities of uranium hexafluoride. These individuals shall be subject to the reinvestigation requirement.

37.25(3) Reinvestigations. Licensees shall conduct a reinvestigation every ten years for any individual with unescorted access to category 1 or category 2 quantities of radioactive material. The reinvestigation shall consist of fingerprinting and an FBI identification and criminal history records check in accordance with rule 641—37.27(136C). The reinvestigations must be completed within ten years of the date on which these elements were last completed.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.26 Reserved.

641—37.27(136C) Requirements for criminal history records checks of individuals granted unescorted access to category 1 or category 2 quantities of radioactive material.

37.27(1) General performance objective and requirements.

a. Except for those individuals listed in rule 641—37.29(136C) and those individuals grandfathered under 37.25(2), each licensee subject to the provisions of these rules shall fingerprint each individual who is to be permitted unescorted access to category 1 or category 2 quantities of radioactive material. Licensees shall transmit all collected fingerprints to the Nuclear Regulatory Commission for transmission to the FBI. The licensee shall use the information received from the FBI as part of the required background investigation to determine whether to grant or deny further unescorted access to category 1 or category 2 quantities of radioactive materials for that individual.

b. The licensee shall notify each affected individual that the individual's fingerprints will be used to secure a review of the individual's criminal history record, and shall inform the individual of the procedures for revising the record or adding explanations to the record.

c. Fingerprinting is not required if a licensee is reinstating an individual's unescorted access authorization to category 1 or category 2 quantities of radioactive materials if:

- (1) The individual returns to the same facility that granted unescorted access authorization within 365 days of the termination of the individual's unescorted access authorization; and
- (2) The previous access was terminated under favorable conditions.

d. Fingerprints do not need to be taken if an individual who is an employee of a licensee, contractor, manufacturer, or supplier has been granted unescorted access to category 1 or category 2 quantities of radioactive material, access to safeguards information, or safeguards information-modified handling by another licensee, based upon a background investigation conducted under these rules, the fingerprint orders, or 10 CFR Part 73. An existing criminal history records check file may be transferred to the licensee asked to grant unescorted access in accordance with the provisions of 37.31(3).

e. Licensees shall use the information obtained as part of a criminal history records check solely for the purpose of determining an individual's suitability for unescorted access authorization to category

1 or category 2 quantities of radioactive materials, access to safeguards information, or safeguards information-modified handling.

37.27(2) Prohibitions.

a. Licensees may not base a final determination to deny an individual unescorted access authorization to category 1 or category 2 quantities of radioactive material solely on the basis of information received from the FBI involving:

(1) An arrest more than one year old for which there is no information of the disposition of the case; or

(2) An arrest that resulted in dismissal of the charge or an acquittal.

b. Licensees may not use information received from a criminal history records check obtained under these rules in a manner that would infringe upon the rights of any individual under the First Amendment to the Constitution of the United States, nor shall licensees use the information in any way that would discriminate among individuals on the basis of race, religion, national origin, gender, or age.

37.27(3) Procedures for processing of fingerprint checks.

a. For the purpose of complying with these rules, licensees shall use an appropriate method listed in 10 CFR 37.7 to submit to the U.S. Nuclear Regulatory Commission, Director, Division of Facilities and Security, 11545 Rockville Pike, ATTN: Criminal History Program/Mail Stop TWB-05 B32M, Rockville, Maryland 20852, one completed, legible standard fingerprint card (Form FD-258, ORIMDNRCOOOZ), electronic fingerprint scan or, where practicable, other fingerprint record for each individual requiring unescorted access to category 1 or category 2 quantities of radioactive material. Copies of these forms may be obtained by writing the Office of the Chief Information Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, by calling (630)829-9565, or by email to FORMS.Resource@nrc.gov. Guidance on submitting electronic fingerprints can be found at www.nrc.gov/site-help/e-submittals.html.

b. Fees for the processing of fingerprint checks are due upon application. Licensees shall submit payment with the application for the processing of fingerprints through corporate check, certified check, cashier's check, money order, or electronic payment, made payable to "U.S. NRC." (For guidance on making electronic payments, contact the Security Branch, Division of Facilities and Security at 1-301-492-3531.) Combined payment for multiple applications is acceptable. The Nuclear Regulatory Commission publishes the amount of the fingerprint check application fee on the NRC's public website. (To find the current fee amount, go to the Electronic Submittals page at www.nrc.gov/site-help/e-submittals.html and see the link for the Criminal History Program under Electronic Submission Systems.)

c. The Nuclear Regulatory Commission will forward to the submitting licensee all data received from the FBI as a result of the licensee's application(s) for criminal history records checks.

[ARC 1479C, IAB 6/11/14, effective 7/16/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—37.28 Reserved.

641—37.29(136C) Relief from fingerprinting, identification, and criminal history records checks and other elements of background investigations for designated categories of individuals permitted unescorted access to certain radioactive materials.

37.29(1) Fingerprinting, identification, and criminal history records checks required by Section 149 of the Atomic Energy Act of 1954, as amended through July 16, 2014, and other elements of the background investigation are not required for the following individuals prior to granting unescorted access to category 1 or category 2 quantities of radioactive materials:

a. An employee of the Nuclear Regulatory Commission or of the executive branch of the U.S. government who has undergone fingerprinting for a prior U.S. government criminal history records check;

b. A member of Congress;

c. An employee of a member of Congress or congressional committee who has undergone fingerprinting for a prior U.S. government criminal history records check;

- d.* The governor of a state or the governor's designated state employee representative;
- e.* Federal, state, or local law enforcement personnel;
- f.* State radiation control program directors and state homeland security advisors or their designated state employee representatives;
- g.* Agreement state employees conducting security inspections on behalf of the NRC under an agreement executed under Section 274.i. of the Atomic Energy Act;
- h.* Representatives of the International Atomic Energy Agency (IAEA) engaged in activities associated with the U.S./IAEA Safeguards Agreement who have been certified by the NRC;
- i.* Emergency response personnel who are responding to an emergency;
- j.* Commercial vehicle drivers for road shipments of category 1 and category 2 quantities of radioactive material;
- k.* Package handlers at transportation facilities such as freight terminals and railroad yards;
- l.* Any individual who has an active federal security clearance, provided that the individual makes available the appropriate documentation. Written confirmation from the agency/employer that granted the federal security clearance or reviewed the criminal history records check must be provided to the licensee. The licensee shall retain this documentation for a period of three years from the date the individual no longer requires unescorted access to category 1 or category 2 quantities of radioactive material; and
- m.* Any individual employed by a service provider licensee for which the service provider licensee has conducted the background investigation for the individual and approved the individual for unescorted access to category 1 or category 2 quantities of radioactive material. Written verification from the service provider must be provided to the licensee. The licensee shall retain the documentation for a period of three years from the date the individual no longer requires unescorted access to category 1 or category 2 quantities of radioactive material.

37.29(2) Fingerprinting, and the identification and criminal history records checks required by Section 149 of the Atomic Energy Act of 1954, as amended through July 16, 2014, are not required for an individual who has had a favorably adjudicated U.S. government criminal history records check within the last five years, under a comparable U.S. government program involving fingerprinting and an FBI identification and criminal history records check provided that the individual makes available the appropriate documentation. Written confirmation from the agency/employer that reviewed the criminal history records check must be provided to the licensee. The licensee shall retain this documentation for a period of three years from the date the individual no longer requires unescorted access to category 1 or category 2 quantities of radioactive material. These programs include, but are not limited to:

- a.* National Agency Check;
- b.* Transportation Worker Identification Credentials (TWIC) under 49 CFR Part 1572;
- c.* Bureau of Alcohol, Tobacco, Firearms, and Explosives background check and clearances under 27 CFR Part 555;
- d.* Health and Human Services security risk assessments for possession and use of select agents and toxins under 42 CFR Part 73;
- e.* Hazardous material security threat assessment for hazardous material endorsement to commercial driver's license under 49 CFR Part 1572; and
- f.* Customs and Border Protection's Free and Secure Trade (FAST) Program.

[ARC 1479C, IAB 6/11/14, effective 7/16/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—37.30 Reserved.

641—37.31(136C) Protection of information.

37.31(1) Each licensee who obtains background information on an individual under these rules shall establish and maintain a system of files and written procedures for protection of the record and the personal information from unauthorized disclosure.

37.31(2) The licensee may not disclose the record or personal information collected and maintained to persons other than the subject individual, the individual's representative, or to those who have a need

to have access to the information in performing assigned duties in the process of granting or denying unescorted access to category 1 or category 2 quantities of radioactive material, safeguards information, or safeguards information-modified handling. No individual authorized to have access to the information may disseminate the information to any other individual who does not have a need to know.

37.31(3) The personal information obtained on an individual from a background investigation may be provided to another licensee:

a. Upon the individual's written request to the licensee holding the data to disseminate the information contained in the individual's file; and

b. If the recipient licensee verifies information such as name, date of birth, social security number, gender, and other applicable physical characteristics.

37.31(4) The licensee shall make background investigation records obtained under these rules available for examination by an authorized representative of the agency to determine compliance with the regulations and laws.

37.31(5) The licensee shall retain all fingerprint and criminal history records on an individual (including data indicating no record) received from the FBI, or a copy of these records if the individual's file has been transferred, for three years from the date the individual no longer requires unescorted access to category 1 or category 2 quantities of radioactive material.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.32 Reserved.

641—37.33(136C) Access authorization program review.

37.33(1) Each licensee shall be responsible for the continuing effectiveness of the access authorization program. Each licensee shall ensure that access authorization programs are reviewed to confirm compliance with the requirements of these rules and that comprehensive actions are taken to correct any noncompliance that is identified. The review program shall evaluate all program performance objectives and requirements. Each licensee shall, at 12-month intervals, review the access program content and implementation.

37.33(2) The results of the reviews, along with any recommendations, must be documented. Each review report must identify conditions that are adverse to the proper performance of the access authorization program, the cause of the condition(s), and, when appropriate, recommend corrective actions, and corrective actions taken. The licensee shall review the findings and take any additional corrective actions necessary to preclude repetition of the condition, including reassessment of the deficient areas where indicated.

37.33(3) Review records must be maintained for three years.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.34 to 37.40 Reserved.

PHYSICAL PROTECTION REQUIREMENTS DURING USE

641—37.41(136C) Security program.

37.41(1) Applicability.

a. Each licensee that possesses an aggregated category 1 or category 2 quantity of radioactive material shall establish, implement, and maintain a security program in accordance with the requirements of rules 641—37.41(136C) to 641—37.57(136C).

b. An applicant for a new license and a licensee that would become newly subject to the requirements of this chapter upon application for amendment of its license shall implement the requirements of this chapter and be inspected by the agency, as appropriate, before a new license or license amendment will be issued.

c. Any licensee that has not previously implemented the security orders or been subject to the provisions of these rules shall provide written notification to the agency as specified in rule

641—37.7(136C) at least 90 days before aggregating radioactive material to a quantity that equals or exceeds the category 2 threshold.

37.41(2) *General performance objective.* Each licensee shall establish, implement, and maintain a security program that is designed to monitor and, without delay, detect, assess, and respond to an actual or attempted unauthorized access to category 1 or category 2 quantities of radioactive material.

37.41(3) *Program features.* Each licensee's security program must include the program features, as appropriate, described in this chapter.

[ARC 1479C, IAB 6/11/14, effective 7/16/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—37.42 Reserved.

641—37.43(136C) General security program requirements.

37.43(1) *Security plan.*

a. Each licensee identified in 37.41(1)“*a*” shall develop a written security plan specific to its facilities and operations. The purpose of the security plan is to establish the licensee's overall security strategy to ensure the integrated and effective functioning of the security program required by these rules.

The security plan must, at a minimum:

- (1) Describe the measures and strategies used to implement the requirements of these rules; and
- (2) Identify the security resources, equipment, and technology used to satisfy the requirements of these rules.

b. The security plan must be reviewed and approved by the individual with overall responsibility for the security program.

c. A licensee shall revise its security plan as necessary to ensure the effective implementation of agency requirements. The licensee shall ensure that:

- (1) The revision has been reviewed and approved by the individual with overall responsibility for the security program; and
- (2) The affected individuals are instructed on the revised plan before the changes are implemented.

d. The licensee shall retain a copy of the current security plan as a record for three years after the security plan is no longer required. If any portion of the plan is superseded, the licensee shall retain the superseded material for three years after the record is superseded.

37.43(2) *Implementing procedures.*

a. The licensee shall develop and maintain written procedures that document how the requirements of these rules and the security plan will be met.

b. The implementing procedures and revisions to these procedures must be approved in writing by the individual with overall responsibility for the security program.

c. The licensee shall retain a copy of the current procedure as a record for three years after the procedure is no longer needed. Superseded portions of the procedure must be retained for three years after the record is superseded.

37.43(3) *Training.*

a. Each licensee shall conduct training to ensure that those individuals implementing the security program possess and maintain the knowledge, skills, and abilities to carry out their assigned duties and responsibilities effectively. The training must include instruction in:

- (1) The licensee's security program and procedures to secure category 1 or category 2 quantities of radioactive material, and in the purposes and functions of the security measures employed;
- (2) The responsibility to report promptly to the licensee any condition that causes or may cause a violation of agency requirements;
- (3) The responsibility of the licensee to report promptly to the local law enforcement agency and licensee any actual or attempted theft, sabotage, or diversion of category 1 or category 2 quantities of radioactive material; and
- (4) The appropriate response to security alarms.

b. In determining those individuals who shall be trained on the security program, the licensee shall consider each individual's assigned activities during authorized use and response to potential situations

involving actual or attempted theft, diversion, or sabotage of category 1 or category 2 quantities of radioactive material. The extent of the training must be commensurate with the individual's potential involvement in the security of category 1 or category 2 quantities of radioactive material.

c. Refresher training must be provided at a frequency not to exceed 12 months and when significant changes have been made to the security program. This training must include:

(1) Review of the training requirements of rule 641—37.43(136C) and any changes made to the security program since the last training;

(2) Reports on any relevant security issues, problems, and lessons learned;

(3) Relevant results of agency inspections; and

(4) Relevant results of the licensee's program review and testing and maintenance.

d. The licensee shall maintain records of the initial and refresher training for three years from the date of the training. The training records must include dates of the training, topics covered, a list of licensee personnel in attendance, and related information.

37.43(4) Protection of information.

a. Licensees authorized to possess category 1 or category 2 quantities of radioactive material shall limit access to and unauthorized disclosure of their security plan, implementing procedures, and the list of individuals that have been approved for unescorted access.

b. Efforts to limit access shall include the development, implementation, and maintenance of written policies and procedures for controlling access to, and for proper handling and protection against unauthorized disclosure of, the security plan and implementing procedures.

c. Before granting an individual access to the security plan or implementing procedures, licensees shall:

(1) Evaluate an individual's need to know the security plan or implementing procedures; and

(2) If the individual has not been authorized for unescorted access to category 1 or category 2 quantities of radioactive material, safeguards information, or safeguards information-modified handling, the licensee must complete a background investigation to determine the individual's trustworthiness and reliability. A trustworthiness and reliability determination shall be conducted by the reviewing official and shall include the background investigation elements contained in 37.25(1).

d. Licensees need not subject the following individuals to the background investigation elements for protection of information:

(1) The categories of individuals listed in rule 641—37.29(136C); or

(2) Security service provider employees, provided written verification that the employee has been determined to be trustworthy and reliable, by the required background investigation in 37.25(1), has been provided by the security service provider.

e. The licensee shall document the basis for concluding that an individual is trustworthy and reliable and should be granted access to the security plan or implementing procedures.

f. Licensees shall maintain a list of persons currently approved for access to the security plan or implementing procedures. When a licensee determines that a person no longer needs access to the security plan or implementing procedures or no longer meets the access authorization requirements for access to the information, the licensee shall remove the person from the approved list as soon as possible, but no later than seven working days, and take prompt measures to ensure that the individual is unable to obtain the security plan or implementing procedures.

g. When the security plan is not in use, the licensee shall store its security plan and implementing procedures in a manner to prevent unauthorized access. Information stored in nonremovable electronic form must be password protected.

h. The licensee shall retain as a record for three years after the document is no longer needed:

(1) A copy of the information protection procedures; and

(2) The list of individuals approved for access to the security plan or implementing procedures.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.44 Reserved.

641—37.45(136C) LLEA coordination.

37.45(1) A licensee subject to these rules shall coordinate, to the extent practicable, with an LLEA for responding to threats to the licensee's facility, including any necessary armed response. The information provided to the LLEA must include:

a. A description of the facilities and the category 1 and category 2 quantities of radioactive materials along with a description of the licensee's security measures that have been implemented to comply with these rules; and

b. A notification that the licensee will request a timely armed response by the LLEA to any actual or attempted theft, sabotage, or diversion of category 1 or category 2 quantities of material.

37.45(2) The licensee shall notify the agency within three business days if:

a. The LLEA has not responded to the request for coordination within 60 days of the coordination request; or

b. The LLEA notifies the licensee that the LLEA does not plan to participate in coordination activities.

37.45(3) The licensee shall document its efforts to coordinate with the LLEA. The documentation must be kept for three years.

37.45(4) The licensee shall coordinate with the LLEA at least every 12 months, or when changes to the facility design or operation adversely affect the potential vulnerability of the licensee's material to theft, sabotage, or diversion.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.46 Reserved.

641—37.47(136C) Security zones.

37.47(1) Licensees shall ensure that all aggregated category 1 and category 2 quantities of radioactive material are used or stored within licensee established security zones. Security zones may be permanent or temporary.

37.47(2) Temporary security zones must be established as necessary to meet the licensee's transitory or intermittent business activities, such as periods of maintenance, source delivery, and source replacement.

37.47(3) Security zones must, at a minimum, allow unescorted access only to approved individuals through:

a. Isolation of category 1 and category 2 quantities of radioactive materials by the use of continuous physical barriers that allow access to the security zone only through established access control points. A physical barrier is a natural or man-made structure or formation sufficient for the isolation of the category 1 or category 2 quantities of radioactive material within a security zone; or

b. Direct control of the security zone by approved individuals at all times; or

c. A combination of continuous physical barriers and direct control.

37.47(4) For category 1 quantities of radioactive material during periods of maintenance, source receipt, preparation for shipment, installation, or source removal or exchange, the licensee shall, at a minimum, provide sufficient individuals approved for unescorted access to maintain continuous surveillance of sources in temporary security zones and in any security zone in which physical barriers or intrusion detection systems have been disabled to allow such activities.

37.47(5) Individuals not approved for unescorted access to category 1 or category 2 quantities of radioactive material must be escorted by an approved individual when in a security zone.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.48 Reserved.

641—37.49(136C) Monitoring, detection, and assessment.

37.49(1) *Monitoring and detection.*

a. Licensees shall establish and maintain the capability to continuously monitor and detect without delay all unauthorized entries into their security zones. Licensees shall provide the means to maintain

continuous monitoring and detection capability in the event of a loss of the primary power source, or provide for an alarm and response in the event of a loss of this capability to continuously monitor and detect unauthorized entries.

b. Monitoring and detection must be performed by:

(1) A monitored intrusion detection system that is linked to an onsite or offsite central monitoring facility; or

(2) Electronic devices for intrusion detection alarms that will alert nearby facility personnel; or

(3) A monitored video surveillance system; or

(4) Direct visual surveillance by approved individuals located within the security zone; or

(5) Direct visual surveillance by a licensee-designated individual located outside the security zone.

c. A licensee subject to these rules shall also have a means to detect unauthorized removal of the radioactive material from the security zone. This detection capability must provide:

(1) For category 1 quantities of radioactive material, immediate detection of any attempted unauthorized removal of the radioactive material from the security zone. Such immediate detection capability must be provided by:

1. Electronic sensors linked to an alarm; or

2. Continuous monitored video surveillance; or

3. Direct visual surveillance.

(2) For category 2 quantities of radioactive material, weekly verification through physical checks, tamper indicating devices, use, or other means to ensure that the radioactive material is present.

37.49(2) *Assessment.* Licensees shall immediately assess each actual or attempted unauthorized entry into the security zone to determine whether the unauthorized access was an actual or attempted theft, sabotage, or diversion.

37.49(3) *Personnel communications and data transmission.* For personnel and automated or electronic systems supporting the licensee's monitoring, detection, and assessment systems, licensees shall:

a. Maintain continuous capability for personnel communication and electronic data transmission and processing among site security systems; and

b. Provide an alternative communication capability for personnel, and an alternative data transmission and processing capability, in the event of a loss of the primary means of communication or data transmission and processing. Alternative communications and data transmission systems may not be subject to the same failure modes as the primary systems.

37.49(4) *Response.* Licensees shall immediately respond to any actual or attempted unauthorized access to the security zones, or actual or attempted theft, sabotage, or diversion of category 1 or category 2 quantities of radioactive material at licensee facilities or temporary job sites. For any unauthorized access involving an actual or attempted theft, sabotage, or diversion of category 1 or category 2 quantities of radioactive material, the licensee's response shall include requesting, without delay, an armed response from the LLEA.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.50 Reserved.

641—37.51(136C) Maintenance and testing.

37.51(1) Each licensee subject to these rules shall implement a maintenance and testing program to ensure that intrusion alarms, associated communication systems, and other physical components of the systems used to secure or detect unauthorized access to radioactive material are maintained in operable condition and are capable of performing their intended function when needed. The equipment relied on to meet the security requirements of this chapter must be inspected and tested for operability and performance at the manufacturer's suggested frequency. If there is no suggested manufacturer's suggested frequency, the testing must be performed at least annually, not to exceed 12 months.

37.51(2) The licensee shall maintain records on the maintenance and testing activities for three years.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.52 Reserved.

641—37.53(136C) Requirements for mobile devices. Each licensee that possesses mobile devices containing category 1 or category 2 quantities of radioactive material must:

37.53(1) Have two independent physical controls that form tangible barriers to secure the material from unauthorized removal when the device is not under direct control and constant surveillance by the licensee; and

37.53(2) For devices in or on a vehicle or trailer, unless the health and safety requirements for a site prohibit the disabling of the vehicle, utilize a method to disable the vehicle or trailer when not under direct control and constant surveillance by the licensee. Licensees shall not rely on the removal of an ignition key to meet this requirement.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.54 Reserved.

641—37.55(136C) Security program review.

37.55(1) Each licensee shall be responsible for the continuing effectiveness of the security program. Each licensee shall ensure that the security program is reviewed to confirm compliance with the requirements of these rules and that comprehensive actions are taken to correct any noncompliance that is identified. The review must include the radioactive material security program content and implementation. Each licensee shall periodically (at least annually) review the security program content and implementation.

37.55(2) The results of the review, along with any recommendations, must be documented. Each review report must identify conditions that are adverse to the proper performance of the security program, the cause of the condition(s), and, when appropriate, recommend corrective actions, and corrective actions taken. The licensee shall review the findings and take any additional corrective actions necessary to preclude repetition of the condition, including reassessment of the deficient areas where indicated.

37.55(3) The licensee shall maintain the review documentation for three years.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.56 Reserved.

641—37.57(136C) Reporting of events.

37.57(1) The licensee shall immediately notify the LLEA after determining that an unauthorized entry resulted in an actual or attempted theft, sabotage, or diversion of a category 1 or category 2 quantity of radioactive material. As soon as possible after initiating a response, but not at the expense of causing delay or interfering with the LLEA response to the event, the licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays). In no case shall the notification to the agency be later than four hours after the discovery of any attempted or actual theft, sabotage, or diversion.

37.57(2) The licensee shall assess any suspicious activity related to possible theft, sabotage, or diversion of category 1 or category 2 quantities of radioactive material and notify the LLEA as appropriate. As soon as possible but not later than four hours after notifying the LLEA, the licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays).

37.57(3) The initial telephonic notification required by 37.57(1) must be followed within a period of 30 days by a written report submitted to the agency. The report must include sufficient information for agency analysis and evaluation, including identification of any necessary corrective actions to prevent future instances.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.58 to 37.70 Reserved.

PHYSICAL PROTECTION IN TRANSIT

641—37.71(136C) Additional requirements for transfer of category 1 and category 2 quantities of radioactive material. A licensee transferring a category 1 or category 2 quantity of radioactive material to a licensee of the agency, the Nuclear Regulatory Commission or an agreement state shall meet the license verification provisions listed in this rule instead of those listed in 641—subrule 39.4(41):

37.71(1) Any licensee transferring category 1 quantities of radioactive material to a licensee of the agency, the Nuclear Regulatory Commission or an agreement state, prior to conducting such transfer, shall verify with the agency, the NRC's license verification system or the license-issuing authority that the transferee's license authorizes the receipt of the type, form, and quantity of radioactive material to be transferred and that the licensee is authorized to receive radioactive material at the location requested for delivery. If the verification is conducted by contacting the license-issuing authority, the transferor shall document the verification. For transfers within the same organization, the licensee does not need to verify the transfer.

37.71(2) Any licensee transferring category 2 quantities of radioactive material to a licensee of the agency, the Nuclear Regulatory Commission or an agreement state, prior to conducting such transfer, shall verify with the agency, the NRC's license verification system or the license-issuing authority that the transferee's license authorizes the receipt of the type, form, and quantity of radioactive material to be transferred. If the verification is conducted by contacting the license-issuing authority, the transferor shall document the verification. For transfers within the same organization, the licensee does not need to verify the transfer.

37.71(3) In an emergency where the licensee cannot reach the agency, or the license-issuing authority and the license verification system are nonfunctional, the licensee may accept a written certification by the transferee that it is authorized by license to receive the type, form, and quantity of radioactive material to be transferred. The certification must include the license number, current revision number, issuing agency, expiration date and, for a category 1 shipment, the authorized address. The licensee shall keep a copy of the certification. The certification must be confirmed by contacting the agency or by use of the NRC's license verification system or by contacting the license-issuing authority by the end of the next business day.

37.71(4) The transferor shall keep a copy of the verification documentation as a record for three years.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.72 Reserved.

641—37.73(136C) Applicability of physical protection of category 1 and category 2 quantities of radioactive material during transit. The shipping licensee shall be responsible for meeting the requirements of this chapter unless the receiving licensee has agreed in writing to arrange for the in-transit physical protection required under this chapter.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.74 Reserved.

641—37.75(136C) Preplanning and coordination of shipment of category 1 or category 2 quantities of radioactive material.

37.75(1) Each licensee that plans to transport, or deliver to a carrier for transport, licensed material that is a category 1 quantity of radioactive material outside the confines of the licensee's facility or other place of use or storage shall:

- a. Preplan and coordinate shipment arrival and departure times with the receiving licensee;
- b. Preplan and coordinate shipment information with the governor or the governor's designee of any state through which the shipment will pass to:
 - (1) Discuss the state's intention to provide law enforcement escorts; and
 - (2) Identify safe havens; and

c. Document the preplanning and coordination activities.

37.75(2) Each licensee that plans to transport, or deliver to a carrier for transport, licensed material that is a category 2 quantity of radioactive material outside the confines of the licensee's facility or other place of use or storage shall coordinate the shipment no-later-than arrival time and the expected shipment arrival with the receiving licensee. The licensee shall document the coordination activities.

37.75(3) Each licensee who receives a shipment of a category 2 quantity of radioactive material shall confirm receipt of the shipment with the originator. If the shipment has not arrived by the no-later-than arrival time, the receiving licensee shall notify the originator.

37.75(4) Each licensee who transports or plans to transport a shipment of a category 2 quantity of radioactive material and determines that the shipment will arrive after the no-later-than arrival time provided pursuant to 37.75(2) shall promptly notify the receiving licensee of the new no-later-than arrival time.

37.75(5) The licensee shall retain a copy of the documentation for preplanning and coordination and any revision thereof, as a record for three years.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.76 Reserved.

641—37.77(136C) Advance notification of shipment of category 1 quantities of radioactive material.

37.77(1) As specified in 37.77(1) "a" and "b," each licensee shall provide advance notification to the NRC and the governor of a state, or the governor's designee, of the shipment of licensed material in a category 1 quantity, through or across the boundary of the state, before the transport, or delivery to a carrier for transport, of the licensed material outside the confines of the licensee's facility or other place of use or storage.

a. *Procedures for submitting advance notification.*

(1) The notification must be made to the NRC and to the office of each appropriate governor or governor's designee. The contact information, including telephone and mailing addresses, of governors and governors' designees, is available on the NRC's website at sep.nrc.gov/special/designee.pdf. A list of the contact information is also available upon request from the Director, Division of Intergovernmental Liaison and Rulemaking, Office of Federal and State Materials and Environmental Management Programs, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Notifications to the NRC must be to the NRC's Director, Division of Security Policy, Office of Nuclear Security and Incident Response, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. The notification to the NRC may be made by email to RAMQC_SHIPMENTS@nrc.gov or by fax to (301)816-5151.

(2) A notification delivered by mail must be postmarked at least seven days before transport of the shipment commences at the shipping facility.

(3) A notification delivered by any means other than mail must reach the NRC at least four days before the transport of the shipment commences and must reach the office of the governor or the governor's designee at least four days before transport of a shipment within or through the state.

b. *Information to be furnished in advance notification of shipment.* Each advance notification of shipment of category 1 quantities of radioactive material must contain the following information, if available at the time of notification:

(1) The name, address, and telephone number of the shipper, carrier, and receiver of the category 1 radioactive material;

(2) The license numbers of the shipper and receiver;

(3) A description of the radioactive material contained in the shipment, including the radionuclides and quantity;

(4) The point of origin of the shipment and the estimated time and date that shipment will commence;

(5) The estimated time and date that the shipment is expected to enter each state along the route;

- (6) The estimated time and date of arrival of the shipment at the destination; and
- (7) A point of contact, with a telephone number, for current shipment information.

c. Revision notice.

(1) The licensee shall provide any information not previously available at the time of the initial notification, as soon as the information becomes available but not later than commencement of the shipment, to the governor of the state or the governor's designee and to the NRC's Director of Nuclear Security, Office of Nuclear Security and Incident Response, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

(2) A licensee shall promptly notify the governor of the state or the governor's designee of any changes to the information provided in accordance with 37.77(1) "b" and 37.77(1) "c"(1). The licensee shall also immediately notify the NRC's Director, Division of Security Policy, Office of Nuclear Security and Incident Response, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, of any such changes.

d. Cancellation notice. Each licensee who cancels a shipment for which advance notification has been sent shall send a cancellation notice to the governor of each state or to the governor's designee previously notified and to the NRC's Director, Division of Security Policy, Office of Nuclear Security and Incident Response, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. The licensee shall send the cancellation notice before the shipment would have commenced or as soon thereafter as possible. The licensee shall state in the notice that it is a cancellation and identify the advance notification that is being canceled.

e. Records. The licensee shall retain a copy of the advance notification and any revision and cancellation notices as a record for three years.

f. Protection of information. State officials, state employees, and other individuals, whether or not licensees of the commission or an agreement state, who receive schedule information of the kind specified in 37.77(1) "b" shall protect that information against unauthorized disclosure as specified in 37.43(4).

[ARC 1479C, IAB 6/11/14, effective 7/16/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—37.78 Reserved.

641—37.79(136C) Requirements for physical protection of category 1 and category 2 quantities of radioactive material during shipment.

37.79(1) Shipments by road.

a. Each licensee who transports, or delivers to a carrier for transport, in a single shipment, a category 1 quantity of radioactive material shall:

(1) Ensure that movement control centers are established that maintain position information from a remote location. These control centers must monitor shipments 24 hours a day, seven days a week, and have the ability to communicate immediately, in an emergency, with the appropriate law enforcement agencies.

(2) Ensure that redundant communications are established that allow the transport to contact the escort vehicle (when used) and movement control center at all times. Redundant communications may not be subject to the same interference factors as the primary communication.

(3) Ensure that shipments are continuously and actively monitored by a telemetric position monitoring system or an alternative tracking system reporting to a movement control center. A movement control center must provide positive confirmation of the location, status, and control over the shipment. The movement control center must be prepared to promptly implement preplanned procedures in response to deviations from the authorized route or a notification of actual, attempted, or suspicious activities related to the theft, loss, or diversion of a shipment. These procedures will include, but not be limited to, the identification of and contact information for the appropriate LLEA along the shipment route.

(4) Provide an individual to accompany the driver for those highway shipments with a driving time period greater than the maximum number of allowable hours of service in a 24-hour-duty day

as established by the Department of Transportation Federal Motor Carrier Safety Administration. The accompanying individual may be another driver.

(5) Develop written normal and contingency procedures to address:

1. Notifications to the communication center and law enforcement agencies;

2. Communication protocols. Communication protocols must include a strategy for the use of authentication codes and duress codes and provisions for refueling or other stops, detours, and locations where communication is expected to be temporarily lost;

3. Loss of communications; and

4. Responses to an actual or attempted theft or diversion of a shipment.

(6) Each licensee who makes arrangements for the shipment of category 1 quantities of radioactive material shall ensure that drivers, accompanying personnel, and movement control center personnel have access to the normal and contingency procedures.

b. Each licensee that transports category 2 quantities of radioactive material shall maintain constant control or surveillance, or both, during transit and have the capability for immediate communication to summon appropriate response or assistance.

c. Each licensee who delivers to a carrier for transport, in a single shipment, a category 2 quantity of radioactive material shall:

(1) Use carriers that have established package tracking systems. An established package tracking system is a documented, proven, and reliable system routinely used to transport objects of value. In order for a package tracking system to maintain constant control or surveillance, or both, the package tracking system must allow the shipper or transporter to identify when and where the package was last reported and when it should arrive at the next point of control.

(2) Use carriers that maintain constant control or surveillance, or both, during transit and have the capability for immediate communication to summon appropriate response or assistance; and

(3) Use carriers that have established tracking systems that require an authorized signature prior to releasing the package for delivery or return.

37.79(2) Shipments by rail.

a. Each licensee who transports, or delivers to a carrier for transport, in a single shipment, a category 1 quantity of radioactive material shall:

(1) Ensure that rail shipments are monitored by a telemetric position monitoring system or an alternative tracking system reporting to the licensee, third-party, or railroad communications center. The communications center shall provide positive confirmation of the location of the shipment and its status. The communications center shall implement preplanned procedures in response to deviations from the authorized route or to a notification of actual, attempted, or suspicious activities related to the theft or diversion of a shipment. These procedures will include, but not be limited to, the identification of and contact information for the appropriate LLEA along the shipment route.

(2) Ensure that periodic reports to the communications center are made at preset intervals.

b. Each licensee who transports, or delivers to a carrier for transport, in a single shipment, a category 2 quantity of radioactive material shall:

(1) Use carriers that have established package tracking systems. An established package tracking system is a documented, proven, and reliable system routinely used to transport objects of value. In order for a package tracking system to maintain constant control or surveillance, or both, the package tracking system must allow the shipper or transporter to identify when and where the package was last reported and when it should arrive at the next point of control.

(2) Use carriers that maintain constant control or surveillance, or both, during transit and have the capability for immediate communication to summon appropriate response or assistance; and

(3) Use carriers that have established tracking systems that require an authorized signature prior to releasing the package for delivery or return.

37.79(3) Investigations. Each licensee who makes arrangements for the shipment of category 1 quantities of radioactive material shall immediately conduct an investigation upon the discovery that a category 1 shipment is lost or missing. Each licensee who makes arrangements for the shipment of category 2 quantities of radioactive material shall immediately conduct an investigation, in coordination

with the receiving licensee, of any shipment that has not arrived by the designated no-later-than arrival time.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.80 Reserved.

641—37.81(136C) Reporting of events.

37.81(1) The shipping licensee shall notify the appropriate LLEA and the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays) within 1 hour of the shipping licensee's determination that a shipment of category 1 quantities of radioactive material is lost or missing. The appropriate LLEA would be the law enforcement agency in the area of the shipment's last confirmed location. During the investigation required by 37.79(3), the shipping licensee will provide agreed-upon updates to the agency on the status of the investigation.

37.81(2) The shipping licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays) within 4 hours of the shipping licensee's determination that a shipment of category 2 quantities of radioactive material is lost or missing. If, after 24 hours of its determination that the shipment is lost or missing and the radioactive material has not been located and secured, the licensee shall immediately notify the agency.

37.81(3) The shipping licensee shall notify the designated LLEA along the shipment route as soon as possible upon discovery of any actual or attempted theft or diversion of a shipment or suspicious activities related to the theft or diversion of a shipment of a category 1 quantity of radioactive material. As soon as possible after notifying the LLEA, the licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays) upon discovery of any actual or attempted theft or diversion of a shipment, or any suspicious activity related to the shipment, of category 1 radioactive material.

37.81(4) The shipping licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays) as soon as possible upon discovery of any actual or attempted theft or diversion of a shipment, or any suspicious activity related to the shipment, of a category 2 quantity of radioactive material.

37.81(5) The shipping licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays) and the LLEA as soon as possible upon recovery of any lost or missing category 1 quantities of radioactive material.

37.81(6) The shipping licensee shall notify the agency at (515)281-3478 (normal hours) or (515)323-4360 (after hours and holidays) as soon as possible upon recovery of any lost or missing category 2 quantities of radioactive material.

37.81(7) The initial telephonic notification required by 37.81(1) through 37.81(4) must be followed within a period of 30 days by a written report submitted to the agency. A written report is not required for notifications on suspicious activities required by 37.81(3) and 37.81(4). The report must set forth the following information:

- a.* A description of the licensed material involved, including kind, quantity, and chemical and physical form;
- b.* A description of the circumstances under which the loss or theft occurred;
- c.* A statement of disposition, or probable disposition, of the licensed material involved;
- d.* Actions that have been taken, or will be taken, to recover the material; and
- e.* Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed material.

37.81(8) Subsequent to filing the written report, the licensee shall also report any additional substantive information on the loss or theft within 30 days after the licensee learns of such information.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.82 to 37.100 Reserved.

RECORDS

641—37.101(136C) Form of records. Each record required by this chapter must be legible throughout the retention period specified by each agency rule. The record may be the original or a reproduced copy or a microform, provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records, such as letters, drawings, and specifications, must include all pertinent information such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.102 Reserved.

641—37.103(136C) Record retention. Licensees shall maintain the records that are required by this chapter for the period specified by the appropriate rule. If a retention period is not otherwise specified, these records must be retained until the agency terminates the facility's license. All records related to this chapter may be destroyed upon agency termination of the facility license.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

641—37.104 Reserved.

641—37.105(136C) Inspections.

37.105(1) Each licensee shall afford to the agency at all reasonable times opportunity to inspect category 1 or category 2 quantities of radioactive material and the premises and facilities wherein the nuclear material is used, produced, or stored.

37.105(2) Each licensee shall make available to the agency for inspection, upon reasonable notice, records kept by the licensee pertaining to its receipt, possession, use, acquisition, import, export, or transfer of category 1 or category 2 quantities of radioactive material.

[ARC 1479C, IAB 6/11/14, effective 7/16/14]

CHAPTER 37—APPENDIX A

CATEGORY 1 AND CATEGORY 2 RADIOACTIVE MATERIALS

Table 1—Category 1 and Category 2 Threshold

The terabecquerel (TBq) values are the regulatory standard. The curie (Ci) values specified are obtained by converting from the TBq value. The curie values are provided for practical usefulness only.

| Radioactive material | Category 1 (TBq) | Category 1 (Ci) | Category 2 (TBq) | Category 2 (Ci) |
|----------------------|------------------|-----------------|------------------|-----------------|
| Americium-241 | 60 | 1,620 | 0.6 | 16.2 |
| Americium-241/Be | 60 | 1,620 | 0.6 | 16.2 |
| Californium-252 | 20 | 540 | 0.2 | 5.40 |
| Cobalt-60 | 30 | 810 | 0.3 | 8.10 |
| Curium-244 | 50 | 1,350 | 0.5 | 13.5 |
| Cesium-137 | 100 | 2,700 | 1 | 27.0 |
| Gadolinium-153 | 1,000 | 27,000 | 10 | 270 |
| Iridium-192 | 80 | 2,160 | 0.8 | 21.6 |
| Plutonium-238 | 60 | 1,620 | 0.6 | 16.2 |
| Plutonium-239/Be | 60 | 1,620 | 0.6 | 16.2 |
| Promethium-147 | 40,000 | 1,080,000 | 400 | 10,800 |
| Radium-226 | 40 | 1,080 | 0.4 | 10.8 |
| Selenium-75 | 200 | 5,400 | 2 | 54.0 |
| Strontium-90 | 1,000 | 27,000 | 10 | 270 |
| Thulium-170 | 20,000 | 540,000 | 200 | 5,400 |
| Ytterbium-169 | 300 | 8,100 | 3 | 81.0 |

Note: Calculations Concerning Multiple Sources or Multiple Radionuclides. The “sum of fractions” methodology for evaluating combinations of multiple sources or multiple radionuclides is to be used in determining whether a location meets or exceeds the threshold and is thus subject to the requirements of this chapter.

I. If multiple sources of the same radionuclide and/or multiple radionuclides are aggregated at a location, the sum of the ratios of the total activity of each of the radionuclides must be determined to verify whether the activity at the location is less than the category 1 or category 2 thresholds of Table 1, as appropriate. If the calculated sum of the ratios, using the equation below, is greater than or equal to 1.0, then the applicable requirements of this chapter apply.

II. First determine the total activity for each radionuclide from Table 1. This is done by adding the activity of each individual source, material in any device, and any loose or bulk material that contains the radionuclide. Then use the equation below to calculate the sum of the ratios by inserting the total activity of the applicable radionuclides from Table 1 in the numerator of the equation and the corresponding threshold activity from Table 1 in the denominator of the equation.

Calculations must be performed in metric values (i.e., TBq) and the numerator and denominator values must be in the same units.

R_1 = total activity for radionuclide 1

R_2 = total activity for radionuclide 2

R_N = total activity for radionuclide n

AR_1 = activity threshold for radionuclide 1

AR_2 = activity threshold for radionuclide 2

AR_N = activity threshold for radionuclide n

$$\sum_1^n \left[\frac{R_1}{AR_1} + \frac{R_2}{AR_2} + \frac{R_n}{AR_n} \right] \geq 1.0$$

These rules are intended to implement Iowa Code chapter 136C.

[Filed ARC 1479C (Notice ARC 1414C, IAB 4/2/14), IAB 6/11/14, effective 7/16/14]

[Filed ARC 3746C (Notice ARC 3578C, IAB 1/17/18), IAB 4/11/18, effective 5/16/18]

CHAPTER 38
GENERAL PROVISIONS FOR RADIATION MACHINES
AND RADIOACTIVE MATERIALS

641—38.1(136C) Purpose and scope.

38.1(1) Except as otherwise specifically provided, these rules apply to all persons who receive, possess, use, transfer, own, or acquire any source of radiation; provided, however, that nothing in these rules shall apply to any person to the extent such person is subject to regulation by the U.S. Nuclear Regulatory Commission. Attention is directed to the fact that regulation by the state of source material, by-product material, and special nuclear material in quantities not sufficient to form a critical mass is subject to the provisions of the agreement between the state and the U.S. Nuclear Regulatory Commission and to 10 CFR Part 150 of the Commission's regulations.

38.1(2) All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

38.1(3) The provisions of Chapter 38 are in addition to, and not in substitution for, any other applicable portions of 641—Chapter 37 and Chapters 39 to 45.

[ARC 8982B, IAB 8/11/10, effective 9/15/10; ARC 1479C, IAB 6/11/14, effective 7/16/14; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—38.2(136C) Definitions. As used in these rules, these terms have the definitions set forth below and are adopted by reference and included herein for 641—Chapters 39 to 45.

“Absorbed dose” means the energy imparted by ionizing radiation per unit mass of irradiated material. It is determined as the quotient of dE by dM, where dE is the mean energy imparted by ionizing radiation to matter of mass dM. The SI unit of absorbed dose is joule per kilogram and the special name of the unit of absorbed dose is the gray (Gy). The units of absorbed dose are the gray (Gy) and the rad.

“Absorbed dose rate” means absorbed dose per unit time, for machines with timers, or dose monitor unit per unit time for linear accelerators.

“Accelerator” means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 MeV. For purposes of this definition, “particle accelerator” is an equivalent term.

“Accelerator-produced material” means any material made radioactive by a particle accelerator.

“Act” means 1984 Iowa Acts, chapter 1286, relating to regulation of radiation machines and radioactive materials. (Iowa Code chapter 136C)

“Activity” means the rate of disintegration or transformation or decay of radioactive material. The units of activity are the curie (Ci) and the becquerel (Bq).

“Adult” means an individual 18 years of age or older.

“Agency” means the Iowa department of public health.

“Agreement state” means any state with which the U.S. Nuclear Regulatory Commission or the U.S. Atomic Energy Commission has entered into an effective agreement under Subsection 274b of the Atomic Energy Act of 1954 as amended (73 Stat. 689).

“Airborne radioactive material” means any radioactive material dispersed in the air in the form of dusts, fumes, particles, mists, vapors, or gases.

“Airborne radioactivity area” means a room, enclosure, or area in which airborne radioactive material (composed wholly or partly of licensed material) exists in concentrations (1) in excess of the derived air concentrations (DACs) specified in Appendix A of 641—Chapter 40; or (2) to such a degree that an individual present in the area without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 0.6 percent of the annual limit on intake (ALI) or 12 DAC-hours.

“Air kerma (K)” means the kinetic energy released in air by ionizing radiation. Kerma is determined as the quotient of dE by dM, where dE is the sum of the initial kinetic energies of all the charged ionizing

particles liberated by uncharged ionizing particles in air of mass dM . The SI unit of air kerma is joule per kilogram and the special name for the unit of kerma is the gray (Gy).

“Air-purifying respirator” means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

“Annually” means at least once every 365 days.

“As low as is reasonably achievable” (ALARA) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in these rules as is practical, consistent with the purpose for which the licensed or registered activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed or registered sources of radiation in the public interest.

“Assembler” means any person engaged in the business of assembling, replacing, or installing one or more components into an X-ray system or subsystem. The term includes the owner of an X-ray system or the employee or agent who assembles components into an X-ray system that is subsequently used to provide professional or commercial services.

“Assigned protection factor (APF)” means the expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.

“Atmosphere-supplying respirator” means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

“Background radiation” means radiation from cosmic sources; naturally occurring radioactive materials, including radon (except as a decay product of source or special nuclear material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the licensee. “Background radiation” does not include sources of radiation from radioactive materials regulated by the agency.

“Barrier” (see “Protective barrier”).

“Beam axis” means a line from the source through the centers of the X-ray fields.

“Beam-limiting device” means a field defining collimator, integral to the system, which provides a means to restrict the dimensions of the X-ray field or useful beam.

“Beam monitoring system” means a system designed and installed in the radiation head to detect and measure the radiation present in the useful beam.

“Becquerel” (Bq) means the SI unit of activity. One becquerel is equal to 1 disintegration or transformation per second (dps or tps).

“Bioassay” means the determination of kinds, quantities or concentrations and, in some cases, the locations of radioactive material in the human body, whether by direct measurement, in vivo counting, or by analysis and evaluation of materials excreted or removed from the human body. For purposes of these rules, “radiobioassay” is an equivalent term.

“Bone densitometry unit” means a medical device which uses electronically produced ionizing radiation to determine the density of bone structures of human patients.

“Brachytherapy” means a method of radiation therapy in which sealed sources are utilized to deliver a radiation dose at a distance of up to a few centimeters, by surface, intracavitary, intraluminal, or interstitial application.

“Brachytherapy source” means a radioactive source or a manufacturer-assembled source train or a combination of these sources that is designed to deliver a therapeutic dose within a distance of a few centimeters.

“By-product material” means:

1. Any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;

2. The tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium or thorium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute “by-product material” within this definition;

3. Any discrete source of radium-226 that is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity or any material that:

- Has been made radioactive by use of a particle accelerator; and
- Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and

4. Any discrete source of naturally occurring radioactive material, other than source material, that:

- The Nuclear Regulatory Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate federal agency, determines would pose a threat to the public health and safety or the common defense and security similar to the threat posed by a discrete source of radium-226; and

- Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

“*Cabinet radiography*” means industrial radiography conducted in an enclosure or cabinet shielded so that radiation levels at every location on the exterior meet the limitations specified in 641—40.26(136C).

“*Calendar quarter*” means not less than 12 consecutive weeks nor more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January and subsequent calendar quarters shall be so arranged such that no day is included in more than one calendar quarter and no day in any one year is omitted from inclusion within a calendar quarter. No licensee or registrant shall change the method of determining calendar quarters for purposes of these rules except at the beginning of a year.

“*Calibration*” means the determination of (1) the response or reading of an instrument relative to a series of known radiation values over the range of the instrument, or (2) the strength of a source of radiation relative to a standard.

“*Carrier*” means a person engaged in the transportation of passengers or property by land or water as a common, contract, or private carrier, or by civil aircraft.

“*CFR*” means Code of Federal Regulations.

“*Changeable filters*” means any filter, exclusive of inherent filtration, which can be removed from the useful beam through any electronic, mechanical, or physical process.

“*Collective dose*” means the sum of the individual doses received in a given period of time by a specified population from exposure to a specified source of radiation.

“*Committed dose equivalent*” ($H_{T,50}$) means the dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

“*Committed effective dose equivalent*” ($H_{E,50}$) is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to each of these organs or tissues ($H_{E,50} = \sum w_T H_{T,50}$).

“*Consignment*” means each shipment of a package or groups of packages or load of radioactive material offered by a shipper for transport.

“*Consortium*” means an association of medical use licensees and a PET radionuclide production facility in the same geographical area that jointly own or share in the operation and maintenance cost of the PET radionuclide production facility that produces PET radionuclides for use in producing radioactive drugs within the consortium for noncommercial distributions among its associated members for medical use. The PET radionuclide production facility within the consortium must be located at an educational institution, a federal facility or a medical facility.

“*Constraint*” or “*dose constraint*” means a value above which specified licensee actions are required.

“*Controlled area*” means an area, outside of a restricted area but inside the site boundary, access to which can be limited by the licensee or registrant for any reason.

“*Critical group*” means the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances.

“*Curie*” means a unit of quantity of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of $3.7E+10$ transformations per second (tps).

“*Decay-in-storage*” means the holding of radioactive material having half-lives of less than 120 days, except Cobalt-57, until it decays to background levels. Before disposal in ordinary trash, the material must have been held for a minimum of ten half-lives and its radioactivity is indistinguishable from background as indicated by a survey meter set on its most sensitive scale with no interposing shielding.

“*Decommission*” means to remove a facility or site safely from service and reduce residual radioactivity to a level that permits:

1. Release of the property for unrestricted use and termination of the license; or
2. Release of the property under restricted conditions and termination of the license.

“*Deep dose equivalent*” (H_d), which applies to external whole body exposure, means the dose equivalent at a tissue depth of 1 centimeter (1000 mg/cm^2).

“*Demand respirator*” means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

“*Depleted uranium*” means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

“*Detector*” (see “Radiation detector”).

“*Diagnostic clinical procedures manual*” means a collection of written procedures that describes each method (and other instructions and precautions) by which the licensee performs diagnostic clinical procedures; where each diagnostic clinical procedure has been approved by the authorized user and includes the radiopharmaceutical, dosage, and route of administration.

“*Diagnostic imaging system*” means an assemblage of components for the generation, emission, reception, transformation, storage and visual display of the resultant image.

“*Diagnostic X-ray imaging system*” means an assemblage of components for the generation, emission and reception of X-rays and the transformation, storage and visual display of the resultant X-ray image which are designed and used for irradiation of any part of the human or animal body for the purpose of diagnosis or visualization.

“*Direct supervision*” means guidance and instruction by a qualified individual who is physically present and watching the performance of the radiological operation or procedure and in such proximity that contact can be maintained and immediate assistance can be given as required.

“*Discrete source*” means a radionuclide that has been processed so that its concentration within a material has been purposely increased for use for commercial, medical, or research activities.

“*Disposable respirator*” means a respirator for which maintenance is not intended and that is designed to be discarded after excessive breathing resistance, sorbent exhaustion, physical damage, or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).

“*Distinguishable from background*” means that the detectable concentration of a radionuclide is statistically different from the background concentration of that radionuclide in the vicinity of the site or, in the case of structures, in similar materials using adequate measurement technology, survey, and statistical techniques.

“*Dose*” is a generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, total organ dose equivalent, or total effective dose equivalent. For purposes of these rules, “radiation dose” is an equivalent term.

“*Dose equivalent (H_T)*” means the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the sievert (Sv) and rem.

“*Dose limits*” means the permissible upper bounds of radiation doses established in accordance with these rules. For purposes of these rules, “limits” is an equivalent term.

“*Effective dose equivalent (H_E)*” means the sum of the products of the dose equivalent to each organ or tissue (H_T) and the weighting factor (w_T) applicable to each of the body organs or tissues that are irradiated ($H_E = \sum w_T H_T$).

“*Embryo/fetus*” means the developing human organism from conception until the time of birth.

“*Entrance or access point*” means any opening through which an individual or extremity of an individual could gain access to radiation areas or to licensed or registered radioactive materials. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.

“*Exposure*” means being exposed to ionizing radiation or to radioactive material.

“*Exposure*” means the quotient of dQ by dm where “ dQ ” is the absolute value of the total charge of the ions of one sign produced in air when all the electrons (negatrons and positrons) liberated by photons in a volume element of air having mass “ dm ” are completely stopped in air. (The special unit of exposure is the roentgen (R) (see 641—38.2(136C) for SI equivalent coulomb per kilogram). When not underlined as above or when indicated as ‘exposure’ or (X), the term “exposure” has a more general meaning in these rules.

“*Exposure rate*” means the exposure per unit of time, such as roentgen per minute and milliroentgen per hour.

“*External dose*” means that portion of the dose equivalent received from any source of radiation outside the body.

“*Extremity*” means hand, elbow, arm below the elbow, foot, knee, and leg below the knee. See 641—subrule 42.1(2) for definitions of “lower extremities” and “upper extremities” for purposes of certification standards.

“*Facility*” means the location, building, vehicle, or complex under one administrative control, at which radioactive material is stored or used or at which one or more radiation machines are installed, located or used.

“*Filtering facepiece (dust mask)*” means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium, which is not equipped with elastomeric sealing surfaces and adjustable straps.

“*Fit factor*” means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

“*Fit test*” means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

“*Former U.S. Atomic Energy Commission (AEC) or U.S. Nuclear Regulatory Commission (NRC) licensed facilities*” means nuclear reactors, nuclear fuel reprocessing plants, uranium enrichment plants, or critical mass experimental facilities where AEC or NRC licenses have been terminated.

“*Generally applicable environmental radiation standards*” means standards issued by the U.S. Environmental Protection Agency (EPA) under the authority of the Atomic Energy Act of 1954, as amended, that impose limits on radiation exposures or levels, or concentrations or quantities of radioactive material, in the general environment outside the boundaries of locations under the control of persons possessing or using radioactive material.

“*Gray (Gy)*” means the SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule per kilogram (1 Gy=100 rad).

“*Half-value layer (HVL)*” means the thickness of a specified material which attenuates X-radiation or gamma radiation to an extent such that the air kerma rate, exposure rate or absorbed dose rate is reduced to one-half of the value measured without the material at the same point. The contribution of all scattered radiation, other than any which might be present initially in the beam concerned, is deemed to be excluded.

“*Hazardous waste*” means those wastes designated as hazardous by U.S. Environmental Protection Agency regulations in 40 CFR Part 261.

“*Healing arts*” means the occupational fields of diagnosing or treating disease, providing health care and improving health by the practice of medicine, osteopathy, chiropractic, podiatry, dentistry, nursing, veterinary medicine, and supporting professions, such as physician assistants, nurse practitioners, radiologic technologists, and dental hygienists.

“*Helmet*” means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

“*High dose-rate remote afterloader*” means a brachytherapy device that remotely delivers a dose rate in excess of 1200 rads (12 gray) per hour at the point or surface where the dose is prescribed.

“*High-level radioactive waste*” or “*HLW*” means (1) irradiated reactor fuel; (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel; and (3) solids into which such liquid wastes have been converted.

“*High radiation area*” means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual’s receiving a dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from any source of radiation or 30 centimeters from any surface that the radiation penetrates.

“*Highway route controlled quantity*” means a quantity within a single package which exceeds:

1. 3,000 times the A_1 value of the radionuclides as specified in 49 CFR 173.435 for special form Class 7 (radioactive) material;
2. 3,000 times the A_2 value of the radionuclides as specified in 49 CFR 173.435 for normal form Class 7 (radioactive) material; or
3. 1,000 TBq (27,000 Ci), whichever is least.

“*Hood*” means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

“*Human use*” means the internal or external administration of radiation or radioactive material to human beings.

“*Individual*” means any human being.

“*Individual monitoring*” means the assessment of:

1. Dose equivalent by the use of devices designed to be worn by an individual or by the use of survey data; or
2. Committed effective dose equivalent by bioassay or by determination of the time-weighted air concentrations to which an individual has been exposed, that is, DAC-hours. See the definition of DAC-hours in 641—Chapter 40.

“*Individual monitoring devices*” means devices designed to be worn by a single individual for the assessment of dose equivalent. For purposes of these rules, “personnel dosimeter” and “dosimeter” are equivalent terms. Examples of individual monitoring devices are film badges, thermoluminescent dosimeters (TLDs), pocket ionization chambers, optically stimulated luminescent (OSL) devices, and personal air sampling devices.

“*Industrial radiography*” means an examination of the structure of materials by nondestructive methods, utilizing ionizing radiation to make radiographic images.

“*Inspection*” means an official examination or observation including, but not limited to, tests, surveys, and monitoring to determine compliance with rules, regulations, orders, requirements, and conditions of the agency.

“*Instrument traceability*” means, for ionizing radiation measurements, the ability to show that an instrument has been calibrated at specified time intervals using a national standard or a transfer standard. If a transfer standard is used, the calibration must be from a laboratory accredited by a program which required continuing participation in measurement quality assurance with the National Institute of Standards and Technology or other equivalent national or international program.

“*Interlock*” means a device preventing the start or continued operation of equipment unless certain predetermined conditions prevail.

“*Internal dose*” means that portion of the dose equivalent received from radioactive material taken into the body.

“Ionizing radiation.” See “Radiation.”

“Irradiation” means the exposure of a living being or matter to ionizing radiation.

“Kilovolt (kV)(kilo electron volt (keV))” means the energy equal to that acquired by a particle with one electron charge in passing through a potential difference of 1000 volts in a vacuum.

“Lead equivalent” means the thickness of lead affording the same attenuation, under specified conditions, as the material in question.

“Leakage radiation” means radiation emanating from the diagnostic or therapeutic source assembly except for:

1. The useful beam, and
2. Radiation produced when the exposure switch or timer is not activated.

“Lens dose equivalent (LDE)” applies to the external exposure of the lens of the eye and is taken as the dose equivalent at a tissue depth of 0.3 centimeter (300 mg/cm²).

“License” means a license issued by the agency in accordance with the rules adopted by the agency.

“Licensed (or registered) material” means radioactive material received, possessed, used, transferred or disposed of under a general or specific license (or registration) issued by the agency.

“Licensed practitioner” means a person licensed or otherwise authorized by law to practice medicine, osteopathy, chiropractic, podiatry, or dentistry in Iowa, or certified as a physician assistant as defined in Iowa Code section 148C.1, subsection 6, and is authorized to prescribe X-ray tests for the purpose of diagnosis or treatment.

“Licensee” means any person who is licensed by the agency in accordance with these rules and the Act.

“Licensing state” means any state with regulations equivalent to the suggested state regulations for control of radiation relating to, and an effective program for, the regulatory control of NARM and which has been granted final designation by the Conference of Radiation Control Program Directors, Inc.

“Light field” means that area of the intersection of the light beam from the beam-limiting device and one of the set of planes parallel to and including the plane of the image receptor, whose perimeter is the locus of points at which the illumination is one-fourth of the maximum in the intersection.

“Limits.” See “Dose limits.”

“Loose-fitting facepiece” means a respiratory inlet covering that is designed to form a partial seal with the face.

“Lost or missing licensed (or registered) source of radiation” means licensed (or registered) source of radiation whose location is unknown. This definition includes licensed (or registered) material that has been shipped but has not reached its planned destination and whose location cannot be readily traced in the transportation system.

“Lot tolerance percent defective” means, expressed in percent defective, the poorest quality in an individual inspection lot that should be accepted.

“Low dose-rate remote afterloader” means a brachytherapy device that remotely delivers a dose rate of less than or equal to 200 rads (2 gray) per hour at the point or surface where the dose is prescribed.

“mA” means milliamperere.

“Major processor” means a user processing, handling, or manufacturing radioactive material exceeding Type A quantities as unsealed sources or material, or exceeding four times Type B quantities as sealed sources, but does not include nuclear medicine programs, universities, industrial radiographers, or small industrial programs. Type A and B quantities are defined in this rule.

“Mammography” means the radiography of the breast except as defined in 641—subrule 41.6(1).

“Mammography unit” means an assemblage of components for the production of X-rays for use during mammography, including, at a minimum: an X-ray generator, an X-ray control, a tube housing assembly, a beam-limiting device, and the supporting structures for these components.

“Manual brachytherapy” means a type of brachytherapy in which the brachytherapy sources (e.g., seeds, ribbons) are manually placed topically on or inserted either into the body cavities that are in close proximity to a treatment site or directly into the tissue volume.

“*Medical use*” means the intentional internal or external administration of radioactive material or the radiation therefrom to patients or human research subjects under the supervision of an authorized user.

“*Medium dose-rate remote afterloader*” means a brachytherapy device that remotely delivers a dose rate of greater than 200 rads (2 gray), but less than 1200 rads (12 gray) per hour at the point or surface where the dose is prescribed.

“*Member of the public*” means any individual except when that individual is receiving an occupational dose.

“*Minor*” means an individual less than 18 years of age.

“*Misadministration*” means the administration of:

Radiation doses received from linear accelerator therapy, deep X-ray machine therapy or superficial therapy; involving;

Administration of external beam radiation that results, or will result, in unintended permanent functional damage to an organ or a physiological system as determined by a physician.

A dose that differs from the prescribed dose by more than 5 rem (0.05 sievert) effective dose equivalent, 50 rem (0.5 sievert) to an organ or tissue, or 50 rem (0.5 sievert) shallow dose equivalent to the skin; and either:

(1) The total dose delivered differs from the prescribed dose by 20 percent or more; or

(2) The fractionated dose delivered differs from the prescribed dose for a single fraction by 50 percent or more.

A dose that exceeds 5 rem (0.05 sievert) effective dose equivalent, 50 rem (0.5 sievert) to an organ or tissue, or 50 rem (0.5 sievert) shallow dose equivalent to the skin from either of the following:

(1) An administration of the wrong treatment modality.

(2) An administration to the wrong patient or human research subject.

A dose to the skin or an organ or tissue other than the treatment site that exceeds by 50 rem (0.5 sievert) to an organ or tissue and 50 percent or more of the dose expected from the administration defined in the written directive.

“*Monitoring (radiation monitoring, radiation protection monitoring)*” means the measurement of radiation levels, radioactive material concentrations, surface area concentrations or quantities of radioactive material and the use of the results of these measurements to evaluate potential exposures and doses.

“*NARM*” means any naturally occurring or accelerator-produced radioactive material. It does not include by-product, source, or special nuclear material.

“*Natural radioactivity*” means radioactivity of naturally occurring nuclides. For the purpose of meeting the definition of a licensing state by the Conference of Radiation Control Program Directors, Inc., (CRCPD), NARM refers only to discrete sources of NARM. Diffuse sources of NARM are excluded from consideration by the CRCPD for licensing state designation purposes.

“*Negative pressure respirator (tight fitting)*” means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

“*Nuclear Regulatory Commission (NRC)*” means the U.S. Nuclear Regulatory Commission or its duly authorized representatives.

“*Occupational dose*” means the dose received by an individual in the course of employment in which the individual’s assigned duties involve exposure to radiation or to radioactive material from licensed or unlicensed and registered or unregistered sources of radiation, whether in the possession of the licensee, registrant, or other person. Occupational dose does not include dose received from background radiation, from any medical administration the individual has received, from exposure to individuals administered sources of radiation or radioactive material and released in accordance with 641—subrule 41.2(27), from voluntary participation in medical research programs, or as a member of the public.

“*Package*” means the packaging together with its radioactive contents as presented for transport.

“*Particle accelerator*.” See “Accelerator.”

“*Patient*” means an individual or animal subjected to healing arts examination, diagnosis or treatment.

“Peak tube potential” means the maximum value of the potential difference across the X-ray tube during an exposure.

“Person” means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this state, any other state or political subdivision or agency thereof, and any legal successor, representative, agent, or agency of the foregoing, but shall not include federal government agencies.

“Personnel monitoring equipment.” See “Individual monitoring devices.”

“Phantom” means a volume of material behaving in a manner similar to tissue with respect to the attenuation and scattering of radiation. This requires that both the atomic number (Z) and the density of the material be similar to that of tissue.

“Pharmacist” means an individual licensed by this state to compound and dispense drugs, prescriptions, and poisons.

“Physician” means a person who is currently licensed in Iowa to practice medicine and surgery, osteopathic medicine and surgery, or osteopathy.

“Positive pressure respirator” means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

“Positron emission tomography (PET) radionuclide production facility” means a facility operating a cyclotron or accelerator for the purpose of producing PET radionuclides.

“Powered air-purifying respirator (PAPR)” means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

“Preceptor” means an individual who provides, directs, or verifies training and experience required for an individual to become an authorized user, an authorized medical physicist, an authorized nuclear pharmacist, or a radiation safety officer.

“Prescribed dosage” means the specified activity or range of activity of unsealed radioactive material as documented:

1. In a written directive; or
2. In accordance with the directions of the authorized user for procedures performed in 641—subrules 41.2(31) and 41.2(33).

“Prescribed dose” means:

1. For gamma stereotactic radiosurgery, the total dose as documented in the written directive;
2. For teletherapy, particle accelerators and X-ray therapy systems, the total dose and dose per fraction as documented in the written directive;
3. For manual brachytherapy, either the total source strength and exposure time or the total dose, as documented in the written directive; or
4. For remote brachytherapy afterloaders, the total dose and dose per fraction as documented in the written directive.

“Pressure demand respirator” means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

“Primary dose monitoring system” means a system which will monitor the useful beam during irradiation and which will terminate irradiation when a preselected number of dose monitor units have been delivered.

“Primary protective barrier” (see “Protective barrier”).

“Principal activities,” as used in this part, means activities authorized by the license which are essential to achieving the purpose(s) for which the license was issued or amended. Storage during which no licensed material is accessed for use or disposal and activities incidental to decontamination or decommissioning are not principal activities.

“Protective barrier” means a barrier used to reduce radiation exposure. The types of protective barriers are as follows:

1. *“Primary protective barrier”* means the material, excluding filters, placed in the useful beam.
2. *“Secondary protective barrier”* means a barrier sufficient to attenuate the stray radiation to the required degree.

“*Public dose*” means the dose received by a member of the public from exposure to radiation or to radioactive material released by a licensee, registrant, or other person, or to any other source of radiation under the control of a licensee, registrant, or other person. It does not include occupational dose or doses received from background radiation, from any medical administration the individual has received, from exposure to individuals administered sources of radiation or radioactive material and released under 641—subrule 41.2(27) or from voluntary participation in medical research programs.

“*Pyrophoric material*” means any liquid that ignites spontaneously in dry or moist air at or below 130° F (54.4° C) or solid, other than one classed as an explosive, which under normal conditions is liable to cause fires through friction, retained heat from manufacturing or processing, or which can be ignited readily and, when ignited, burns so vigorously and persistently as to create a serious transportation, handling, or disposal hazard. Included are spontaneously combustible and water-reactive materials.

“*Qualified expert*” means an individual having the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs. For example, individuals certified in the appropriate field by the American Board of Radiology, the American Board of Medical Physics, or the American Board of Health Physics, or those having equivalent qualifications. With reference to the calibration of radiation therapy equipment, an individual having, in addition to the above qualifications, training and experience in the clinical applications of radiation physics to radiation therapy, for example, individuals certified in Therapeutic Radiological Physics or X-Ray and Radium Physics by the American Board of Radiology, or those having equivalent qualifications.

“*Qualitative fit test (QLFT)*” means a pass-fail fit test to assess the adequacy of respirator fit that relies on the individual’s response to the test agent.

“*Quality factor*” (Q) means the modifying factor, listed in Tables I and II of 38.4(4), that is used to derive dose equivalent from absorbed dose.

“*Quantitative fit test (QNFT)*” means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

“*Rad*” means the special unit of absorbed dose. One rad is equal to an absorbed dose of 100 erg per gram or 0.01 joule per kilogram (0.01 gray).

“*Radiation*” means alpha particles, beta particles, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. For purposes of these rules, ionizing radiation is an equivalent term. Radiation, as used in these rules, does not include nonionizing radiation, such as radiowaves or microwaves, visible, infrared, or ultraviolet light.

“*Radiation area*” means any area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 0.05 mSv (0.005 rem) in 1 hour at 30 centimeters from the source of radiation or from any surface that the radiation penetrates.

“*Radiation detector*” means a device which, in the presence of radiation, by either direct or indirect means, provides a signal or other indication suitable for use in measuring one or more quantities of incident radiation.

“*Radiation dose.*” See “Dose.”

“*Radiation machine*” means any device capable of producing radiation except those devices with radioactive material as the only source of radiation.

“*Radiation safety officer*” means an individual who has the knowledge and responsibility to apply appropriate radiation protection regulations and has been assigned such responsibility by the licensee or registrant.

“*Radioactive material*” means any solid, liquid, or gas which emits radiation spontaneously.

“*Radioactivity*” means the transformation of unstable atomic nuclei by the emission of radiation.

“*Radiobioassay.*” See “Bioassay.”

“*Radiographic imaging system*” means any system whereby a permanent or semipermanent image is recorded on an image receptor by the action of ionizing radiation.

“*Radionuclide*” means a radioactive element or a radioactive isotope.

“*Registrant*” means any person who is registered with the agency or is legally obligated to register with the agency pursuant to these rules and the Act.

“*Registration*” means registration with the agency in accordance with the rules adopted by the agency.

“*Regulations of the U.S. Department of Transportation*” means the regulations in 49 CFR Parts 100-189.

“*Rem*” means the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rad multiplied by the quality factor (1 rem = 0.01 sievert).

“*Reportable medical event*” means the medical event, except for an event that results from patient intervention, in which the administration of by-product material or radiation from by-product material results in:

a. A dose that differs from the prescribed dose or dose that would have resulted from the prescribed dosage by more than 5 rem (0.05 Sv) effective dose equivalent, 50 rem (0.5 Sv) to an organ or tissue, or 50 rem (0.5 Sv) shallow dose equivalent to the skin; and

1. The total dose delivered differs from the prescribed dose by 20 percent or more;
2. The total dosage delivered differs from the prescribed dosage by 20 percent or more or falls outside the prescribed dosage range; or
3. The fractionated dose delivered differs from the prescribed dose, for a single fraction, by 50 percent or more.

b. A dose that exceeds 5 rem (0.05 Sv) effective dose equivalent, 50 rem (0.5 Sv) to an organ or tissue, or 50 rem (0.5 Sv) shallow dose equivalent to the skin from any of the following:

1. An administration of the wrong radioactive drug containing by-product material;
2. An administration of a radioactive drug containing by-product material by the wrong route of administration;
3. An administration of a dose or dosage to the wrong individual or human research subject;
4. An administration of a dose or dosage delivered by the wrong mode of treatment; or
5. A leaking sealed source.

c. A dose to the skin or an organ or tissue other than the treatment site that exceeds by 50 rem (0.5 Sv) to an organ or tissue and 50 percent or more of the dose expected from the administration defined in the written directive (excluding, for permanent implants, seeds that were implanted in the correct site but migrated outside the treatment site).

d. An event resulting from intervention of a patient or human research subject in which administration of by-product material or radiation from by-product material results or will result in unintended permanent functional damage to an organ or a physiological system, as determined by a physician.

“*Research and development*” means (1) theoretical analysis, exploration, or experimentation; or (2) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes. Research and development does not include the internal or external administration of radiation or radioactive material to human beings.

“*Residual radioactivity*” means radioactivity in structures, materials, soils, groundwater, and other media at a site resulting from activities under the licensee’s control. This includes radioactivity from all licensed and unlicensed sources used by the licensee, but excludes background radiation. It also includes radioactive materials remaining at the site as a result of routine or accidental releases of radioactive material at the site and previous burials at the site, even if those burials were made in accordance with the provisions of 641—Chapter 40 or any previous state or federal licenses, rules or regulations.

“*Restricted area*” means an area, access to which is limited by the licensee or registrant for the purpose of protecting individuals against undue risks from exposure to sources of radiation. A restricted area shall not include any areas used for residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

“*Roentgen*” means the special unit of exposure. One roentgen (R) equals 2.58×10^{-4} coulombs/kilogram of air (see “Exposure” and 38.4(4)).

“*Scattered radiation*” means ionizing radiation emitted by interaction of ionizing radiation with matter, the interaction being accompanied by a change in direction of the radiation. Scattered primary

radiation means that scattered radiation which has been deviated in direction only by materials irradiated by the useful beam.

“*Sealed source*” means radioactive material that is encased in a capsule designed to prevent leakage or escape of the radioactive material.

“*Secondary dose monitoring system*” means a system which will terminate irradiation in the event of failure of the primary dose monitoring system.

“*Secondary protective barrier*” (see “Protective barrier”).

“*Self-contained breathing apparatus (SCBA)*” means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

“*Shallow dose equivalent*” (H_s), which applies to the external exposure of the skin of the whole body or the skin of an extremity, means the dose equivalent at a tissue depth of 0.007 centimeter (7 mg/cm^2).

“*Shutter*” means a device attached to the tube housing assembly which can intercept the entire cross-sectional area of the useful beam and which has a lead equivalency not less than that of the tube housing assembly.

“*SI*” means the abbreviation for the International System of Units.

“*Sievert*” means the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sievert is equal to the absorbed dose in gray multiplied by the quality factor ($1 \text{ Sv} = 100 \text{ rem}$).

“*Simulator (radiation therapy simulation system)*” means any X-ray system intended for localizing the volume to be exposed during radiation therapy and reproducing the position and size of the therapeutic irradiation field.

“*Site area emergency*” means events may occur, are in progress, or have occurred that could lead to a significant release of radioactive material and that could require a response by off-site response organizations to protect persons off site.

“*Site boundary*” means that line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee or registrant.

“*Source*” means the focal spot of the X-ray tube.

“*Source material*” means:

1. Uranium or thorium, or any combination thereof, in any physical or chemical form; or
2. Ores that contain by weight one-twentieth of 1 percent (0.05 percent) or more of uranium, thorium or any combination of uranium and thorium. Source material does not include special nuclear material.

“*Source material milling*” means any activity that results in the production of by-product material as defined by definition (2) of by-product material.

“*Source of radiation*” means any radioactive material or any device or equipment emitting, or capable of producing, radiation.

“*Source traceability*” means the ability to show that a radioactive source has been calibrated either by the national standards laboratory of the National Institute of Standards and Technology or by a laboratory which participates in continuing measurement quality assurance programs with the National Institute of Standards and Technology or other equivalent national or international program.

“*Special form radioactive material*” means radioactive material which satisfies the following conditions:

1. It is either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule;
2. The piece or capsule has at least one dimension not less than 5 millimeters (0.2 inch); and
3. It satisfies the test requirements specified by the U.S. Nuclear Regulatory Commission. A special form encapsulation designed in accordance with the U.S. Nuclear Regulatory Commission requirements in effect on June 30, 1983, and constructed prior to July 1, 1985, may continue to be used. A special form encapsulation either designed or constructed after June 30, 1985, must meet requirements of this definition applicable at the time of its design or construction.

“*Special nuclear material*” means:

1. Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the agency declares by order to be special nuclear material after the U.S. Nuclear Regulatory Commission, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, determines to be special nuclear material, but does not include source material; or

2. Any material artificially enriched by any of the foregoing but does not include source material.

“*Special nuclear material in quantities not sufficient to form a critical mass*” means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium-233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination shall not exceed 1. For example, the following quantities in combination would not exceed the limitation and are within the formula:

$$\frac{175 \text{ (grams contained U-235)}}{350} + \frac{50 \text{ (grams U-233)}}{200} + \frac{50 \text{ (grams Pu)}}{200} = 1$$

“*SSD*” means the distance between the source and the skin entrance plane of the patient (see “*Target-to-skin distance (TSD)*”).

“*Stray radiation*” means the sum of leakage and scattered radiation.

“*Supplied-air respirator (SAR)*” or “*airline respirator*” means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

“*Survey*” means an evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal, or presence of sources of radiation. When appropriate, such evaluation includes a physical survey of the location of radioactive material and measurements or calculations of levels of radiation or concentrations or quantities of radioactive material present.

“*Target-to-skin distance (TSD)*” means the distance measured along the beam axis from the center of the front surface of the X-ray target or electron virtual source scattering foil to the surface of the irradiated object or patient.

“*Teletherapy*” means therapeutic irradiation in which the source of radiation is at a distance from the body.

“*Termination of irradiation*” means the stopping of irradiation in a fashion which will not permit continuance of irradiation without the resetting of operating conditions at the control panel.

“*Test*” means the process of verifying compliance with an applicable regulation.

“*These rules*” means 641—Chapters 38 to 45.

“*Tight-fitting facepiece*” means a respirator inlet covering that forms a complete seal with the face.

“*Total effective dose equivalent*” (TEDE) means the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

“*Total organ dose equivalent*” (TODE) means the sum of the deep dose equivalent and the committed dose equivalent to the organ receiving the highest dose as described in 641—40.86(1) “f.”

“*Traceable to a national standard.*” See “*Instrument traceability*” or “*Source traceability.*”

“*Treatment site*” means the anatomical description of the tissue intended to receive a radiation dose, as described in the written directive.

“*Tube*” means an X-ray tube unless otherwise specified. See “*X-ray tube.*”

“*Tube housing assembly*” means the tube housing with tube installed. It includes high-voltage or filament transformers, or both, and other appropriate elements when such are contained within the tube housing.

“*Type A quantity*” means a quantity of radioactive material, the aggregate radioactivity of which does not exceed A_1 for special form radioactive material, or A_2 , for normal form radioactive material as defined in 10 CFR 71.4.

“*Type B quantity*” means a quantity of radioactive material greater than a Type A quantity as defined in 10 CFR 71.4.

“*Unrefined and unprocessed ore*” means ore in its natural form prior to any processing, such as grinding, roasting, beneficiating, or refining. Processing does not include sieving or encapsulation of ore or preparation of samples for laboratory analysis.

“*Unrestricted area*” means an area to which access is neither limited nor controlled by the licensee or registrant. For purposes of these rules, “uncontrolled area” is an equivalent term.

“*U.S. Department of Energy*” means the Department of Energy established by Public Law 95-91, August 4, 1977, 91 Stat. 565, 42 U.S.C. 7101 et seq., to the extent that the department exercises functions formerly vested in the U.S. Atomic Energy Commission, its chairman, members, officers and components and transferred to the U.S. Energy Research and Development Administration and to the administrator thereof pursuant to Sections 104(b), (c) and (d) of the Energy Reorganization Act of 1974 (Public Law 93-438, October 11, 1974, 88 Stat. 1233 at 1237, effective January 19, 1975) and retransferred to the Secretary of Energy pursuant to Section 301(a) of the Department of Energy Organization Act (Public Law 95-91, August 4, 1977, 91 Stat. 565 at 577-578, 42 U.S.C. 7151, effective October 1, 1977).

“*User seal check (fit check)*” means an action conducted by the respirator user to determine if the respirator is properly seated to the face. Examples include negative pressure check, positive pressure check, irritant smoke check, or isoamyl acetate check.

“*Very high radiation area*” means an area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual’s receiving an absorbed dose in excess of 500 rad (5 Gy) in 1 hour at 1 meter from a source of radiation or 1 meter from any surface that the radiation penetrates.

“*Waste*” means those low-level radioactive wastes containing source, special nuclear, or by-product material that are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level radioactive waste means radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined in paragraphs “2,” “3” and “4” of the definition of “by-product material” set forth in this chapter.

“*Waste handling licensees*” means persons licensed to receive and store radioactive wastes prior to disposal or persons licensed to dispose of radioactive waste.

“*Wedge filter*” means an added filter effecting continuous progressive attenuation on all or part of the useful beam.

“*Week*” means seven consecutive days starting on Sunday.

“*Whole body*” means, for purposes of external exposure, head, trunk including male gonads, arms above the elbow, or legs above the knee.

“*Worker*” means an individual engaged in work under a license or registration issued by the agency and controlled by a licensee or registrant, but does not include the licensee or registrant.

“*Working level*” (WL) means any combination of short-lived radon daughters in 1 liter of air that will result in the ultimate emission of $1.3E+5$ MeV of potential alpha particle energy. The short-lived radon daughters are—for radon-222: polonium-218, lead-214, bismuth-214, and polonium-214; and for radon-220: polonium-216, lead-212, bismuth-212, and polonium-212.

“*Working level month*” (WLM) means an exposure to 1 working level for 170 hours—2,000 working hours per year divided by 12 months per year is approximately equal to 170 hours per month.

“*Written directive*” means an order in writing for a specific patient or human research subject, dated and signed by an authorized user prior to the administration of a radiopharmaceutical or by an individual qualified by training and experience to conduct particle accelerator therapy or radiation for X-ray therapy, as specified in 641—subrule 41.2(87).

“*X-radiation*” means penetrating electromagnetic radiation with energy greater than 0.1 kV produced by bombarding a metallic target with fast electrons in a high vacuum.

“*X-ray tube*” means any electron tube which is designed to be used primarily for the production of X-rays.

“*Year*” means the period of time beginning in January used to determine compliance with the provisions of these rules. The licensee or registrant may change the starting date of the year used to

determine compliance by the licensee or registrant provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

[ARC 8982B, IAB 8/11/10, effective 9/15/10; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—38.3(136C) Exemptions from the regulatory requirements.

38.3(1) General provision. The agency may, upon application therefor or upon its own initiative, grant such exemptions or exceptions from the requirements of the rules in 641—Chapters 38 to 46 as it determines are authorized by law and will not result in undue hazard to public health and safety or property. Application for exemptions or exceptions should be made in accordance with 641—Chapter 178.

38.3(2) Persons using by-product material under certain Department of Energy and Nuclear Regulatory Commission contracts.

a. Except to the extent that NRC facilities or activities of the types subject to licensing pursuant to the Energy Reorganization Act of 1974 are involved, any prime contractor of the NRC is exempt from the license requirements of these rules and from the regulations of these rules to the extent that such contractor, under the contractor's prime contract with the NRC, manufactures, produces, transfers, receives, acquires, owns, possesses, or uses by-product material for:

(1) The performance of work for a department at the United States government-owned or government-controlled site, including the transportation of by-product material to or from such site and the performance of contract services during temporary interruptions of such transportation;

(2) Research in, or development, manufacture, storage, testing or transportation of, atomic weapons or components thereof; or

(3) The use or operation of nuclear reactors or other nuclear devices in a United States government-owned vehicle or vessel.

b. In addition to the foregoing exemptions and subject to the requirement for licensing of NRC facilities and activities pursuant to the requirements of the Energy Reorganization Act of 1974, any prime contractor or subcontractor of the NRC is exempt from the requirements for a license set forth in the Act and from the regulations in these rules to the extent that such prime contractor or subcontractor manufactures, produces, transfers, receives, acquires, owns, possesses, or uses by-product material under the contractor's or subcontractor's prime contract or subcontract when the NRC determines that the exemption of the prime contractor or subcontractor is authorized by law; and that, under the terms of the contract or subcontract, there is adequate assurance that the work can be accomplished without undue risk to the public health and safety.

c. Carriers. Common and contract carriers, freight forwarders, warehousemen, and the U.S. Postal Service are exempt from these rules to the extent that they transport or store radioactive material in the regular course of carriage for another or of storage incident thereto.

641—38.4(136C) General regulatory requirements.

38.4(1) Records.

a. Each licensee and registrant shall maintain records showing the receipt, transfer, and disposal of all sources of radiation. Additional record requirements are specified elsewhere in these rules.

b. Electronic records.

(1) A record or signature shall not be denied legal effect or enforceability solely because it is in electronic form.

(2) A contract shall not be denied legal effect or enforceability solely because an electronic record was used in its formation.

(3) If a rule requires a record to be in writing, an electronic record shall satisfy the rule.

(4) If a rule requires a signature, an electronic signature shall satisfy the rule.

38.4(2) Inspections.

a. Each licensee and registrant shall afford the agency at all reasonable times opportunity to inspect sources of radiation and the premises and facilities wherein such sources of radiation are used or stored.

b. Each licensee and registrant shall make available to the agency for inspection, upon reasonable notice, records maintained pursuant to these rules.

38.4(3) Tests. Each licensee and registrant shall perform upon instructions from the agency, or shall permit the agency to perform, such reasonable tests as the agency deems appropriate or necessary including, but not limited to, tests of:

- a.* Sources of radiation;
- b.* Facilities wherein sources of radiation are used or stored;
- c.* Radiation detection and monitoring instruments; and
- d.* Other equipment and devices used in connection with utilization or storage of licensed or registered sources of radiation.

38.4(4) Units of exposure and dose.

a. As used in these rules, the quality factors for converting absorbed dose to dose equivalent are shown in Table I.

TABLE I
QUALITY FACTORS AND ABSORBED DOSE EQUIVALENCIES

| TYPE OF RADIATION | Quality Factor (Q) | Absorbed Dose Equal to a Unit Dose Equivalent (see footnote "1") |
|--|--------------------|--|
| X, gamma, or beta radiation and high-speed electrons | 1 | 1 |
| Alpha particles, multiple-charged particles, fission fragments and heavy particles of unknown charge | 20 | 0.05 |
| Neutrons of unknown energy | 10 | 0.1 |
| High-energy protons | 10 | 0.1 |

1. Absorbed dose in rad equal to 1 rem or the absorbed dose in gray equal to 1 sievert.

b. If it is more convenient to measure the neutron fluence rate than to determine the neutron dose equivalent rate in sievert per hour or rem per hour, as provided in 38.4(4) "a," 1 rem (0.01 Sv) of neutron radiation of unknown energies may, for purposes of these rules, be assumed to result from a total fluence of 25 million neutrons per square centimeter incident upon the body. If sufficient information exists to estimate the approximate energy distribution of the neutrons, the licensee or registrant may use the fluence rate per unit dose equivalent or the appropriate Q value from Table II to convert a measured tissue dose in gray or rad to dose equivalent in sievert or rem.

TABLE II
MEAN QUALITY FACTORS, Q, AND FLUENCE PER UNIT DOSE EQUIVALENT FOR MONOENERGETIC NEUTRONS

| | Neutron Energy (MeV) | Quality Factor ^a (Q) | Fluence per Unit Dose Equivalent ^b (neutrons cm ⁻² rem ⁻¹) | Fluence per Unit Dose Equivalent ^b (neutrons cm ⁻² Sv ⁻¹) |
|-----------|----------------------|---------------------------------|--|---|
| (thermal) | 2.5E-8 | 2 | 980E+6 | 980E+8 |
| | 1E-7 | 2 | 980E+6 | 980E+8 |
| | 1E-6 | 2 | 810E+6 | 810E+8 |
| | 1E-5 | 2 | 810E+6 | 810E+8 |
| | 1E-4 | 2 | 840E+6 | 840E+8 |
| | 1E-3 | 2 | 980E+6 | 980E+8 |
| | 1E-2 | 2.5 | 1010E+6 | 1010E+8 |

| Neutron Energy (MeV) | Quality Factor ^a (Q) | Fluence per Unit Dose Equivalent ^b (neutrons cm ⁻² rem ⁻¹) | Fluence per Unit Dose Equivalent ^b (neutrons cm ⁻² Sv ⁻¹) |
|----------------------|---------------------------------|--|---|
| 1E-1 | 7.5 | 170E+6 | 170E+8 |
| 5E-1 | 11 | 39E+6 | 39E+8 |
| 1 | 11 | 27E+6 | 27E+8 |
| 2.5 | 9 | 29E+6 | 29E+8 |
| 5 | 8 | 23E+6 | 23E+8 |
| 7 | 7 | 24E+6 | 24E+8 |
| 10 | 6.5 | 24E+6 | 24E+8 |
| 14 | 7.5 | 17E+6 | 17E+8 |
| 20 | 8 | 16E+6 | 16E+8 |
| 40 | 7 | 14E+6 | 14E+8 |
| 60 | 5.5 | 16E+6 | 16E+8 |
| 1E+2 | 4 | 20E+6 | 20E+8 |
| 2E+2 | 3.5 | 19E+6 | 19E+8 |
| 3E+2 | 3.5 | 16E+6 | 16E+8 |
| 4E+2 | 3.5 | 14E+6 | 14E+8 |

^aValue of quality factor (Q) at the point where the dose equivalent is maximum in a 30-centimeter diameter cylinder tissue-equivalent phantom.

^bMonoenergetic neutrons incident normally on a 30-centimeter diameter cylinder tissue-equivalent phantom.

38.4(5) Units of activity. Rescinded IAB 4/8/98, effective 7/1/98.

38.4(6) Additional requirements. The agency may, by rule, regulation, or order, impose upon any licensee or registrant such requirements in addition to those established in these rules as it deems appropriate or necessary to minimize danger to public health and safety or property.

641—38.5(136C) Administrative actions. Rescinded IAB 4/3/02, effective 5/8/02.

641—38.6(136C) Prohibited uses. A hand-held fluoroscopic screen shall not be used with X-ray equipment unless it has been accepted for certification by the U.S. Food and Drug Administration, Center for Devices and Radiological Health. A shoe-fitting fluoroscopic device shall not be used. Radiation from radiation-emitting machines or radioactive materials shall not be used on humans for nonmedical purposes.

641—38.7(136C) Communications.

38.7(1) All communications and reports concerning these rules, and applications filed thereunder, should be addressed to the agency at its office located at the Iowa Department of Public Health, Bureau of Radiological Health, Lucas State Office Building, 5th Floor, Des Moines, Iowa 50319.

38.7(2) Drafts of proposed regulations released to the department from the federal government which constitute essential information needed by the department to ensure compliance with federal regulations are not available for public examination. Therefore, pursuant to Iowa Code section 22.9, the department waives the provision of Iowa Code section 22.2 as it applies to these proposed draft regulations.

641—38.8(136C) Fees.

38.8(1) Radiation machines.

a. Each registrant shall, at the time of registration and the anniversary date thereafter, as long as the registrant owns the radiation machine, remit to the agency a nonrefundable fee sufficient to defray the cost of registering the equipment with the department. All fees shall be paid annually in the form of a check or money order made payable to the Iowa Department of Public Health. The fees to be paid shall be in the amount computed by the following schedule:

ANNUAL FEE SCHEDULE

| Type of X-ray machine | Fee per tube | Maximum fee |
|--|--------------|-------------|
| 1. Medical | \$51 | \$1500 |
| 2. Osteopathy | \$51 | \$1500 |
| 3. Chiropractic | \$51 | \$1500 |
| 4. Dentistry | \$39 | \$1000 |
| 5. Podiatry | \$39 | \$1000 |
| 6. Veterinary Medicine | \$25 | — |
| 7. (Industrial/Nonmedical Use) | \$50 | — |
| 8. Food Sterilization | \$1000 | — |
| 9. Accelerators and Electronic Brachytherapy Units | \$100 | — |
| 10. Electron Microscope | \$20 | — |
| 11. Bone Densitometry | \$25 | — |

Fees for radiation machines not listed in the above schedule shall not be less than \$50 per unit/tube.

b. Each registrant shall, where appropriate, pay the following special inspections/interpretation fee at the written request of the department:

(1) Mammography unit inspections fees:

- \$900 for the first unit and, if the facility has additional units at the address of the first unit, a fee of \$325 for each additional unit; or
- \$900 per portable unit for each site where the unit is off-loaded and used and where the processing and patient films are stored; or
- Dollar amount to be determined and justified by the department on a case-by-case basis for facilities which do not meet the above criteria; or
- \$450 for the second facility follow-up visit to review or determine the corrective action taken to address noncompliances; or
- \$900 for each stereotactic breast biopsy unit.

(2) Mammography interpretation fees of \$100 per mammography examination provided to the department for the purpose of determining film diagnostic quality.

(3) Industrial and oncology accelerator registrants and electronic brachytherapy registrants shall pay for each inspection a fee of \$400 for the first unit and \$100 for each additional unit.

(4) Industrial radiography X-ray units/walk-in cabinet radiography X-ray unit registrants shall pay for each inspection a fee of \$250 for the first unit and \$75 for each additional unit.

c. Each person who is engaged in the business of installing or offering to furnish radiation machines or is engaged in the business of furnishing or offering to furnish radiation machine servicing or service in the state shall apply for registration of such service with the agency prior to furnishing or offering to furnish any such service. Application shall be on a form provided by the department and include an annual nonrefundable fee of \$100.

d. Each person engaged in providing health physics services in mammography in Iowa, who meets the requirements of 641—paragraph 41.6(3) “c” and is deemed qualified by this agency, must submit a \$40 annual listing fee to this agency.

e. All mammography facilities providing services in Iowa must submit a \$50 annual authorization certification fee.

f. All Iowa-accredited facilities providing mammography services in Iowa must submit a \$200 accreditation fee for initial accreditation and each reaccreditation.

38.8(2) Radioactive material fee schedule. Fees associated with the possession and use of radioactive materials in Iowa shall not exceed those specified in 10 CFR 170.31 and 10 CFR 171.16. The following fee schedule shall apply.

| | Program Code | Category | Type | New License Fee | Inspection Priority | Annual Fee |
|--------|--------------|----------|--|-----------------|---------------------|------------|
| (3.L.) | 01100 | AAB | Academic Type A Broad | \$5,000 | 1 | \$10,500 |
| (8.A.) | 03710 | CD | Civil Defense | \$1,000 | 5 | \$1,000 |
| (3.E.) | 03510 | I1 | Irradiators, Self-Shielding <10,000 Curies | \$2,000 | 5 | \$650 |
| (3.O.) | 03320 | IR1 | Industrial Radiography – Temporary Job Sites | \$4,500 | 1 | \$4,300 |
| (3.P.) | 03120 | FG | Measuring Systems – Fixed Gauge | \$1,300 | 5 | \$650 |
| (3.P.) | 03121 | PG | Measuring Systems – Portable Gauge | \$1,300 | 5 | \$650 |
| (3.P.) | 02410 | IVL | <i>In-Vitro</i> Testing Laboratory | \$1,300 | 5 | \$650 |
| (7.C.) | 02230 | HDR | High Dose Rate Afterloader | \$2,300 | 1 | \$3,400 |
| (7.C.) | 02120 | M1 | Medical – Diagnostic & Therapy | \$2,300 | 3 | \$1,500 |
| (7.C.) | 02121 | M2 | Medical – Diagnostic Only | \$2,300 | 4 | \$1,200 |
| (7.C.) | 02240 | MET | Medical – Diagnostic, Therapeutic, Emerging Technologies | \$2,300 | 2 | \$2,000 |
| (3.S.) | 03210 | PET | Accelerator-Produced RAM | \$3,000 | 1 | \$4,300 |
| (3.C.) | 02500 | NP | Nuclear Pharmacy | \$3,000 | 1 | \$3,500 |
| (7.C.) | 02231 | NV1 | Nuclear Medical Van | \$2,300 | 2 | \$1,800 |
| (7.C.) | 22160 | PMM | Pacemaker – By-Product and/or SNM | \$2,300 | T | Note 5 |
| (3.M.) | 03620 | RD2 | Research & Development – Other | \$2,500 | 3 | \$1,350 |
| (2.C.) | 11300 | SM1 | Source Material, Other, >150 Kilograms | \$6,000 | 3 | \$2,250 |
| (1.D.) | 22120 | SNM2 | SNM Plutonium – Neutron Source | \$1,500 | 5 | \$500 |
| (3.P.) | 03221 | CAL | Calibration and W/L Tests | \$1,300 | 5 | \$650 |
| (3.P.) | 03122 | XRF | X-Ray Fluorescent Analyzer | \$1,300 | 7 | \$650 |
| (3.P.) | 02400 | VMT | Veterinary Medicine – Therapy | \$1,300 | 3 | \$650 |
| (3.B.) | 03214 | MD | Manufacturing/Distribution | \$3,500 | 3 | \$1,800 |

Notes:

1. Reciprocity fee is \$1,800 annually (180 days).
2. Inspection priorities are based on NRC inspection manual chapter 2800. Priority “T” is a telephonic contact and is not considered an inspection.
3. License amendment fee for all categories is \$400.
4. Annual fees are due no later than September 1 of each year. A 10% late charge will be assessed per month for late payments. Licensees with more than two authorized locations of use will be charged an additional 10% of the annual fee per location.
5. Separate annual fees will not be assessed for pacemaker licenses issued to medical institutions that also hold nuclear medicine licenses with the agency.
6. General license registration fee is \$250 annually on registration anniversary.

38.8(3) Industrial radiography testing and certification.

a. A nonrefundable fee of \$175 shall be submitted with each application for taking an industrial radiography examination to become certified by the agency.

b. A fee of \$25 shall be submitted in order to replace lost identification cards issued to industrial radiographers by the agency pursuant to 641—subrule 45.1(10).

c. A nonrefundable fee of \$75 shall be submitted with each application, not associated with an agency-administered industrial radiography examination, for a trainee or trainer card issued to a radiographer's assistant or an industrial radiographer.

38.8(4) *Owner-assessed expenses.* In cases in which the agency determines that the cost of regulating or inspecting registered radiation machine facilities or radioactive materials licensees significantly exceeds the fees charged to the facility, it may assess an additional fee to the owner or user of the source(s) of radiation to cover the actual expenses incurred by the agency.

38.8(5) *Environmental surveillance fee.* A fee may be levied against any licensee, registrant, corporation, company, business, or individual for environmental surveillance activities which are necessary to assess the radiological impact of activities conducted by the licensee, registrant, corporation, company, business, or individual. This fee shall be sufficient to defray actual costs incurred by the agency, including, but not limited to, salaries of agency employees, per diem, travel, and costs of laboratory analysis of samples, when required.

38.8(6) *Certification fees.* Rescinded IAB 2/6/13, effective 3/13/13.

38.8(7) *Returned check and late fees.* Persons who fail to pay required fees to the agency are subject to the following penalties:

a. \$25 for each payment received by the agency in accordance with these rules, for which insufficient funds are available to fulfill the obligation of such payment to the agency.

b. \$25 for each month for failure to pay any fee administered by this agency starting 30 days after the due date of the original notice. This fee is added to the unpaid fee.

38.8(8) *Reciprocity.* Fees paid for reciprocal recognition of out-of-state persons wishing to utilize radiation machines or radioactive materials in Iowa shall allow the out-of-state person to operate for a total of 180 days during the 365-day reciprocity period starting the date the fee is received by the agency.

a. Radiation machines. Any out-of-state person who wishes to bring an X-ray machine or linear accelerators into the state to perform work or services shall pay a reciprocity fee of \$100 for each source of radiation.

b. Radioactive materials. Out-of-state persons wishing to bring sources of radioactive material into Iowa for business purposes may be subject to a reciprocity fee depending on the type of activity to be performed and the type of radioactive materials license possessed (refer to 641—subrule 39.4(90)). If a reciprocity fee is applicable, it shall be assessed at the rate for reciprocity specified in the radioactive materials fee schedule available through the agency for each 365-day reciprocity period.

c. Industrial radiographers wishing to operate in Iowa under an identification card from a jurisdiction recognized by Iowa that charges Iowa card holders a fee will be assessed and must pay a \$100 fee prior to conducting industrial radiography in Iowa.

38.8(9) *Radon certification.* Rescinded IAB 4/3/02, effective 5/8/02.

38.8(10) *Radon mitigation credentialing.* Rescinded IAB 4/3/02, effective 5/8/02.

38.8(11) *Radioactive material transport fee schedule.*

a. All shippers shall pay the following fee(s) unless the department obtains sufficient funding from another source, which may include but is not limited to a federal agency or a contract with a shipper.

(1) \$1800 per highway cask for each truck shipment of spent nuclear fuel, high-level radioactive waste, transuranic waste, or highway route controlled quantity of radioactive materials or any material shipped in accordance with rule 641—37.77(136C) traversing the state or any portion thereof. Single cask truck shipments are subject to a surcharge of \$20 per mile for every mile over 250 miles traveled.

(2) \$1300 for the first cask and \$125 for each additional cask for each rail shipment of spent nuclear fuel, high-level radioactive waste, transuranic waste, or any material shipped in accordance with rule 641—37.77(136C) traversing the state or any portion thereof.

(3) \$175 for each shipment by truck or by rail paid by the shipper for low-level radioactive waste shipped in or across Iowa. The department may accept an annual shipment fee as negotiated with a

shipper or accept payment per shipment. This fee applies to waste shipped to a site authorized by a government agency to receive low-level radioactive waste or shipped to a storage site to be held for future disposal.

b. All fees must be paid by the shipper prior to shipment. Shippers must request an application for a permit to ship radioactive material from the Iowa Department of Transportation, Office of Motor Carrier Services. Assistance may be obtained by calling the Bureau of Radiological Health at (515)281-3478. Other methods of fee payment may be considered by the department on a case-by-case basis upon request of the shipper. A request for an alternative method of payment must be made to the department prior to shipment.

c. All fees received pursuant to this subrule shall be used for purposes related to transporting radioactive material, including enforcement and planning, developing, and maintaining a capability for emergency response.

38.8(12) Fee waiver. Any fee may be waived in exchange for services (low-level waste disposal, radiation detection instrument calibration, instrument repair, sample analysis, etc.) provided to the agency. The waiver may only occur as a result of a 28E agreement between the parties.

[**ARC 8982B**, IAB 8/11/10, effective 9/15/10; **ARC 0577C**, IAB 2/6/13, effective 3/13/13; **ARC 1479C**, IAB 6/11/14, effective 7/16/14; **ARC 3746C**, IAB 4/11/18, effective 5/16/18]

641—38.9(136C) Administrative enforcement actions.

38.9(1) Scope.

a. This rule prescribes the procedure in cases initiated by the staff, or upon a request by any person, to impose requirements by order, or to modify, suspend, or revoke a license, registration, or certificate or to take other action as may be proper against any person subject to the jurisdiction of the agency. The term “regulated entity” as used in this rule refers to any facility, person, partnership, corporation or other organization which is regulated by the agency by virtue of these rules, the Iowa Code, licensing documents, registrations, certificates, or other official regulatory promulgation. “Authorization” means license, registration, certificate, permit, or any other document issued or received by the agency that authorizes specific activities related to the possession and use of radioactive materials or radiation-producing machines in Iowa.

b. This rule also prescribes the procedures in cases initiated by the staff to impose civil penalties pursuant to Iowa Code section 136C.4, to impose serious misdemeanor penalties pursuant to Iowa Code section 136B.5 or to impose simple misdemeanor penalties pursuant to Iowa Code section 136D.8.

38.9(2) Notice of violation.

a. In response to an alleged violation of any provision of the Iowa Code, these rules, the conditions of an authorization issued by the agency or any order issued by the agency, the agency may serve on the regulated entity a written notice of violation; a separate notice may be omitted if an order pursuant to 38.9(3) or demand for information pursuant to 38.9(5) is issued that otherwise identifies the apparent violation. The notice of violation will concisely state the alleged violation(s) and will require that the regulated entity submit, within 30 days of the date of the notice or other specified time, a written explanation or statement in reply including:

- (1) Corrective steps which have been taken by the regulated entity and the results achieved;
- (2) Corrective action which will be taken to prevent recurrence; and
- (3) The date when full compliance will be achieved.

b. The notice may require the regulated entity subject to the jurisdiction of the agency to admit or deny the violation and to state the reasons for the violation, if admitted. It may provide that, if an adequate reply is not received within the time specified in the notice, the agency may issue an order or a demand for information as to why the authorization should not be modified, suspended, or revoked or why such other action as may be proper should not be taken.

c. Violations are categorized according to five levels of severity, which are:

- (1) Severity Levels I and II: Violations are of very significant regulatory concern involving actual or high potential impact on the public health and safety.
- (2) Severity Level III: Violations are cause for significant concern.

(3) Severity Level IV: Violations are less serious but are of more than minor concern and that, if left uncorrected, could lead to a more serious health and safety concern.

(4) Severity Level V: Violations are of minor safety or environmental concern.

d. A group of violations may be evaluated in the aggregate and assigned a single higher severity level if the violations have the same underlying cause or if the violations contributed to or were unavoidable consequences of the underlying problem.

e. The severity level of a violation may be increased if the violation can be considered a repetitive violation. The term “repetitive violation” or “similar violation” means a violation that reasonably could have been prevented by a regulated entity’s corrective action for a previous violation normally occurring within the past two years of the inspection at issue or the period within the last two inspections, whichever is longer.

f. The severity level of a violation may be increased if the violation involves casual disregard of requirements, deception, or other indications of willfulness. The term “willfulness” is that characteristic of violations ranging from deliberate intent to violate or falsify to intentional disregard for regulatory requirements.

38.9(3) Orders.

a. The agency may institute a proceeding to modify, suspend, or revoke an authorization or to take other action as may be proper by serving on the regulated entity an order which will:

(1) Allege the violations with which the regulated entity is charged, or the potentially hazardous conditions or other facts deemed to be sufficient grounds for the proposed action;

(2) Provide that the regulated entity may file a written answer to the order under oath or affirmation within 20 days of its date, or such other time as may be specified in the order;

(3) Inform the regulated entity of its right, within 20 days of the date of the order, or such other time as may be specified in the order, to demand a hearing on all or part of the order, except in a case where the regulated entity has consented in writing to the order;

(4) Specify the issues for hearing; and

(5) State the effective date of the order; if the agency finds that the public health, safety, or interest so requires or that the violation or conduct causing the violation is willful, the order may provide, for stated reasons, that the proposed action be immediately effective pending further order.

b. A regulated entity who receives an order may respond to an order under this subrule by filing a written answer under oath or affirmation. The answer shall specifically admit or deny each allegation or charge made in the order and may set forth the matters of fact and law on which the regulated entity relies, and, if the order is not consented to, the reasons as to why the order should not have been issued. Except as provided in paragraph “*d*” of this subrule, the answer may demand a hearing.

c. If the answer demands a hearing, the agency will issue an order designating the time and place of hearing.

d. An answer or stipulation may consent to the entry of an order in substantially the form proposed in the order with respect to all or some of the actions proposed in the order. The consent, in the answer or other written document, of the regulated entity to whom the order has been issued shall constitute a waiver by the regulated entity of a hearing, findings of fact and conclusions of law, and of all right to seek agency and judicial review or to contest the validity of the order in any forum as to those matters which have been consented to or agreed to or on which a hearing has not been requested. An order that has been consented to shall have the same force and effect as an order made after hearing by a presiding officer or the agency, and shall be effective as provided in the order.

38.9(4) Settlement and compromise. At any time after the issuance of an order designating the time and place of hearing in a proceeding to modify, suspend, or revoke an authorization, the staff and a regulated entity may enter into a stipulation for the settlement of the proceeding or the compromise of a civil penalty.

38.9(5) Demand for information.

a. The agency may issue to a regulated entity a demand for information for the purpose of determining whether an order under 38.9(3) should be issued, or whether other action should be taken, which demand will:

(1) Allege the violations with which the regulated entity is charged, or the potentially hazardous conditions or other facts deemed to be sufficient ground for issuing the demand; and

(2) Provide that the regulated entity must file a written answer to the demand for information under oath or affirmation within 20 days of its date, or such time as may be specified in the demand for information.

b. A regulated entity to whom the agency has issued a demand for information under this subrule must respond to the demand by filing a written answer under oath or affirmation. The regulated entity's answer shall specifically admit or deny each allegation or charge made in the demand for information, and shall set forth the matters of fact and law on which the licensee relies. A person other than a licensee may answer as described above, or by setting forth its reasons why the demand should not have been issued and, if the requested information is not provided, the reasons why it is not provided.

c. Upon review of the answer filed pursuant to 38.9(5) "a"(2), or if no answer is filed, the agency may institute a proceeding pursuant to 38.9(3) to take such action as may be proper.

d. An answer may consent to the entry of an order pursuant to 38.9(3) in substantially the form proposed in the demand for information. Such consent shall constitute a waiver as provided in 38.9(3) "d."

38.9(6) Civil penalties.

a. Before instituting any proceeding to impose a civil penalty under Iowa Code section 136C.4, the agency shall serve a written notice of violation upon the person charged. This notice may be included in a notice issued pursuant to 38.9(2). The notice of violation shall specify the date or dates, facts, and the nature of the alleged act or omission with which the person is charged and shall identify specifically the particular provision or provisions of the law, rule, regulation, license, permit, or cease and desist order involved in the alleged violation and must state the amount of each proposed penalty. The notice of violation shall also advise the person charged that the civil penalty may be paid in the amount specified therein, or the proposed imposition of the civil penalty may be protested in its entirety or in part, by a written answer, either denying the violation or showing extenuating circumstances. The notice of violation shall advise the person charged that upon failure to pay a civil penalty subsequently determined by the agency, if any, unless compromised, remitted, or mitigated, the fee shall be collected by civil action, pursuant to Iowa Code section 136C.4.

b. Within 20 days of the date of a notice of violation or other time specified in the notice, the person charged may either pay the penalty in the amount proposed or answer the notice of violation. The answer to the notice of violation shall state any facts, explanations, and arguments denying the charges of violation, or demonstrating any extenuating circumstances, error in the notice of violation, or other reason why the penalty should not be imposed and may request remission or mitigation of the penalty.

c. If the person charged with violation fails to answer within the time specified in 38.9(6) "b," an order may be issued imposing the civil penalty in the amount set forth in the notice of violation described in 38.9(6) "a."

d. If the person charged with violation files an answer to the notice of violation, the agency, upon consideration of the answer, will issue an order dismissing the proceeding or imposing, mitigating, or remitting the civil penalty. The person charged may, within 20 days of the date of the order or other time specified in the order, request a hearing.

e. If the person charged with violation requests a hearing, the agency will issue an order designating the time and place of hearing.

f. If a hearing is held, an order will be issued after the hearing by the presiding officer or the agency dismissing the proceeding or imposing, mitigating, or remitting the civil penalty.

g. The agency may compromise any civil penalty, subject to the provisions of 38.9(4).

h. If the civil penalty is not compromised, or is not remitted by the presiding officer or the agency, and if payment is not made within ten days following either the service of the order described in 38.9(6) "c" or "f," or the expiration of the time for requesting a hearing described in 38.9(6) "d," the agency may refer the matter to the attorney general for collection.

i. Except when payment is made after compromise or mitigation by the Department of Justice or as ordered by a court of the state, following reference of the matter to the attorney general for collection,

payment of civil penalties imposed under Iowa Code section 136C.4 shall be made by check, draft, or money order payable to the Iowa Department of Public Health.

38.9(7) Requests for action under this rule.

a. Any person may file a request to institute a proceeding pursuant to 38.9(3) to modify, suspend, or revoke an authorization as may be proper. Such a request shall be addressed to the Chief, Bureau of Radiological Health, Iowa Department of Public Health, Lucas State Office Building, Des Moines, Iowa 50319. The requests shall specify the action requested and set forth the facts that constitute the basis for the request. The bureau chief will discuss the matter with staff to determine appropriate action in accordance with 38.9(7) “*b.*”

b. Within a reasonable time after a request pursuant to 38.9(7) “*a.*” has been received, the bureau chief shall either institute the requested proceeding in accordance with this rule or shall advise the person who made the request in writing that no proceeding will be instituted, in whole or in part, with respect to the request, and the reasons for the decision.

c. (1) The bureau chief’s decisions under this rule will be filed and within 25 days after the date of the bureau chief’s decision under this rule that no proceeding will be instituted or other action taken in whole or in part, the agency may on its own motion review that decision, in whole or in part, to determine if the bureau chief has abused discretion. This review power does not limit in any way either the agency’s supervisory power over delegated staff actions or the agency’s power to consult with the staff on a formal or informal basis regarding institution of proceedings under this rule.

(2) No petition or other request for agency review of a bureau chief’s decision under this rule will be entertained by the agency.

38.9(8) Impounding. The agency may impound or order the impounding of radioactive material in the possession of a person who fails to observe the provisions of Iowa Code chapter 136C, or any rules, license or registration conditions, or orders issued by this agency.

a. If agency action is necessary to protect the public health and safety, no prior notice need be given the owner or possessor. If agency action is not necessary to protect the public health and safety, the agency will give to either the owner or the possessor of the source of radiation written notice of the intention to impound the source of radiation.

(1) Either the owner or the possessor shall have 20 days from the date of personal service of certified mailing to request a hearing, except in the case where the regulated entity has consented in writing to the impoundment.

(2) If a hearing is requested, the agency will issue an order designating the time and place of hearing.

b. At the agency’s direction, the impounded sources of radiation may be disposed of by:

(1) Returning the source of radiation to a properly licensed or registered owner that did not cause the emergency;

(2) Returning the source of radiation to a licensee or registrant after the emergency is over and after settlement of any compliance action; or

(3) Selling, destroying, or disposing of the source of radiation in another manner within the agency’s discretion.

641—38.10(136C) Deliberate misconduct.

38.10(1) Any licensee, registrant, applicant for a license or certificate of registration, employee of a licensee, registrant or applicant; or any contractor (including a supplier or consultant), subcontractor, employee of a contractor or subcontractor of any licensee or registrant or applicant for a license or certificate of registration, who knowingly provides to any licensee, applicant, registrant, contractor, or subcontractor any components, equipment, materials, or other goods or services that relate to a licensee’s, registrant’s or applicant’s activities in this rule, may not:

a. Engage in deliberate misconduct that causes or would have caused, if not detected, a licensee, registrant, or applicant to be in violation of any rule, regulation, or order; or any term, condition, or limitation of any license or registration issued by the agency; or

b. Deliberately submit to the agency, a licensee, registrant, applicant, or a licensee's, registrant's, or applicant's contractor or subcontractor, information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the agency.

38.10(2) A person who violates paragraph 38.10(1) "a" or "b" may be subject to enforcement action in accordance with the procedures in 641—38.9(136C).

38.10(3) For the purposes of paragraph 38.10(1) "a," deliberate misconduct by a person means an intentional act or omission that the person knows:

a. Would cause a licensee, registrant, or applicant to be in violation of any rule, regulation, or order; or any term, condition, or limitation of any license issued by the agency; or

b. Constitutes a violation of a requirement, procedure, instruction, contract, purchase order, or policy of a licensee, registrant, applicant, contractor, or subcontractor.

These rules are intended to implement Iowa Code chapter 136C.

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⁰ Two or more ARCs

¹ Effective date of 38.8(11) delayed 70 days from May 9, 2001, by the Administrative Rules Review Committee at its meeting held May 4, 2001.

At its meeting held July 10, 2001, the Committee delayed the effective date until adjournment of the 2002 Session of the General Assembly.

CHAPTER 39
REGISTRATION OF RADIATION MACHINE FACILITIES, LICENSURE OF RADIOACTIVE
MATERIALS AND TRANSPORTATION OF RADIOACTIVE MATERIALS

641—39.1(136C) Purpose and scope.

39.1(1) All persons possessing radiation machines within the state shall be registered in accordance with this chapter, except as specifically exempted.

39.1(2) No person shall receive, possess, use, transfer, own, or acquire radioactive material except as authorized in a specific or general license issued pursuant to this chapter or as otherwise provided in these rules.

39.1(3) All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

39.1(4) In addition to the requirements of this chapter, all registrants are subject to the requirements of 641—Chapters 38 and 40. Furthermore, registrants engaged in healing arts are subject to the requirements of 641—Chapters 41 and 42; registrants engaged in industrial/nonmedical radiographic operations are subject to the requirements of 641—Chapter 45.

39.1(5) In areas under exclusive federal jurisdiction, nothing in these rules applies to the extent that persons are subject to regulation by the U.S. Nuclear Regulatory Commission (NRC) or other federal agencies.

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641—39.2(136C) Definitions. For the purpose of this chapter, the definitions in 641—Chapter 38 may also apply to this chapter.

641—39.3(136C) Requirements for registration of X-ray and other electronic machines that produce radiation.

39.3(1) Exemptions.

a. Electronic equipment that produces radiation incidental to its operation for other purposes is exempt from the registration and notification requirements of this chapter, provided that the dose equivalent rate averaged over an area of 10 square centimeters does not exceed 0.5 millirem (5 μ Sv) per hour at 5 centimeters from any accessible surface of such equipment. The production, testing, or factory servicing of such equipment shall not be exempt.

b. Radiation machines while in transit or storage incident thereto are exempt from the requirements of this chapter.

c. Domestic television receivers are exempt from the requirements of this chapter.

39.3(2) Application for registration of radiation machine facilities. Each person having a radiation machine facility shall:

a. Apply for registration of such facility with the agency prior to the operation of a radiation machine facility. In order to register equipment, the person must have a storage area located in Iowa where records of equipment maintenance and quality assurance, personnel monitoring, and personnel certification must be kept for review during an inspection. The records may be stored on a van, if appropriate. An Iowa mailing address is not required. Application for registration shall be completed on forms furnished by the agency and shall include the appropriate fee from 641—38.8(136C).

b. Designate on the application form an individual to be responsible for radiation protection.

c. Each registrant shall prohibit any person from furnishing radiation machine servicing or services as described in 39.3(3)“*d*” to the registrant’s radiation machine facility until such person provides evidence that the person has been registered with the agency as a provider of services in accordance with 39.3(3).

39.3(3) Application for registration of servicing and services.

a. Each person who is engaged in the business of installing or offering to install radiation machines or is engaged in the business of furnishing or offering to furnish radiation machine servicing or services

in this state shall apply for registration of such services with the agency prior to furnishing or offering to furnish any such services.

b. Application for registration shall be completed on forms furnished by the agency and shall contain all information required by the agency as indicated on the forms and accompanying instructions and include the fee required in 641—paragraph 38.8(1)“c.”

c. Each person applying for registration under this chapter shall specify:

- (1) That the person has read and understands the requirements of these rules;
- (2) The services for which the person is applying for registration;
- (3) The training and experience that qualify the person to discharge the services for which the person is applying for registration;
- (4) The type of measurement instrument to be used, frequency of calibration, and source of calibration; and
- (5) The type of personnel dosimeters supplied, frequency of reading, and replacement or exchange schedule.

d. For the purpose of 39.3(3), services may include but shall not be limited to:

- (1) Installation and servicing of radiation machines and associated radiation machine components;
- (2) Calibration of radiation machines or radiation measurement instruments or devices;
- (3) Radiation protection or health physics consultations or surveys; and
- (4) Processor or processor servicing, or both.
- (5) Calibration and compliance surveys of external beam radiation therapy units.

e. No individual shall perform services which are not specifically stated for that individual on the notice of registration issued by the agency.

f. A registration may be revoked for violating or causing a facility to violate any of the rules in 641—Chapters 38 through 45.

g. Radiation therapy physicists providing services for therapeutic radiation machines must provide proof that the training requirements of 641—subrule 41.3(6) have been met.

39.3(4) Issuance of notice of registration.

a. Upon a determination that an applicant meets the requirements of this chapter, the agency shall issue a notice of registration.

b. The agency may incorporate in the notice of registration at the time of issuance or thereafter by appropriate rule, regulation, or order, such additional requirements and conditions with respect to the registrant’s receipt, possession, use, and transfer of radiation machines as it deems appropriate or necessary.

39.3(5) Expiration of notice of registration. Except as provided by 39.3(6)“b,” each notice of registration shall expire within 12 months of issuance or at the end of the specified day in the month and year stated therein.

39.3(6) Renewal of notice of registration.

a. Application for renewal of registration shall be filed in accordance with 39.3(2) or 39.3(3).

b. In any case in which a registrant has properly filed an application for renewal of current registration within 90 days prior to the expiration of the existing registration, such existing registration shall not expire until the application status has been finally determined by the agency.

39.3(7) Report of changes. The registrant shall notify the agency in writing before making any change which would render the information contained in the application for registration or the notice of registration no longer accurate.

39.3(8) Approval not implied. No person, in any advertisement, shall refer to the fact that the person or the person’s facility is registered with the agency pursuant to the provisions of 39.3(2) or 39.3(3), and no person shall state or imply that any activity under such registration has been approved by the agency.

39.3(9) Assembler and transfer obligation.

a. Any person who sells, leases, transfers, lends, disposes of, assembles, or installs radiation machines in this state shall notify the agency in writing within 15 days of:

- (1) The name and address of persons who have received these machines;
- (2) The manufacturer, model, and serial number of each radiation machine transferred; and

(3) The date of transfer of each radiation machine.

b. No person shall make, sell, lease, transfer, lend, assemble, or install radiation machines or the supplies used in connection with such machines unless such supplies and equipment, when properly placed in operation and used, shall meet the requirements of 641—Chapters 38, 39, 40 and 41.

c. In the case of diagnostic X-ray systems which contain certified components, a copy of the assembler's report prepared in accordance with the requirements of the federal diagnostic X-ray standard (21 CFR 1020.30(d)) shall be submitted to the agency within 15 days following completion of the assembly. Such report shall suffice in lieu of any other report by the assembler.

39.3(10) Reciprocity—out-of-state radiation machines.

a. Whenever any radiation machine is to be brought into the state, for any temporary use, the person proposing to bring such machine into the state shall give written notice to the agency at least three working days before such machine is to be used in the state. The notice shall include:

- (1) The type of radiation machine;
- (2) The nature, duration, and scope of use;
- (3) The exact location(s) where the radiation machine is to be used; and
- (4) States in which this machine is registered.

b. If, for a specific case, the three-working-day period would impose an undue hardship on the person, upon application to the agency, permission to proceed sooner may be granted.

c. The person referred to in 39.3(10)“a” shall:

- (1) Comply with all applicable rules of the agency;
- (2) Supply the agency with such other information as the agency may reasonably request; and
- (3) Not operate within the state on a temporary basis in excess of 180 calendar days in a 365-day reciprocity period. The 365-day reciprocity period starts on the day the agency receives the appropriate fee, as specified in 641—subrule 38.8(8), and ends exactly 365 days later. It is the registrant's responsibility to ensure the 180-day limit is not exceeded during the 365-day reciprocity period and to ensure that the reciprocal recognition is renewed 30 days prior to the expiration of the 365-day reciprocity period.

39.3(11) Exemption. Rescinded IAB 4/8/98, effective 7/1/98.

641—39.4(136C) Requirements for licensing of radioactive materials.

39.4(1) Additional requirements.

a. In addition to the requirements of this chapter, all licensees are subject to the requirements of 641—Chapters 38, 40 and 41. Furthermore, licensees engaged in industrial/nonmedical radiographic operations are subject to the requirements of 641—Chapter 45; licensees using radionuclides in the healing arts are subject to the requirements of 641—41.2(136C) and 641—Chapter 42; and licensees engaged in land disposal of radioactive material are subject to the requirements of 641—Chapter 40.

b. An Iowa radioactive materials license requires that the person have a permanent storage area in Iowa where records are maintained pertaining to licensed activities, equipment maintenance and quality assurance, personnel monitoring, and personnel certification and where material can be stored. The records may be stored on a van, if appropriate. The storage area must be accessible during inspections. An Iowa mailing address is not required.

39.4(2) Source material.

a. Any person is exempt from this chapter to the extent that such person receives, possesses, uses, owns, or transfers source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than 1/20 of 1 percent (0.05 percent) of the mixture, compound, solution, or alloy.

b. Any person is exempt from this chapter to the extent that such person receives, possesses, uses, or transfers unrefined and unprocessed ore containing source material; provided that, except as authorized in a specific license, such person shall not refine or process such ore.

c. Any person is exempt from the requirements for a license set forth in this chapter and from the rules in this chapter and 641—Chapter 40 to the extent that such person receives, possesses, uses, or transfers:

- (1) Any quantities of thorium contained in:
 1. Incandescent gas mantles,
 2. Vacuum tubes,
 3. Welding rods,
 4. Electric lamps for illuminating purposes, provided that each lamp does not contain more than 50 milligrams of thorium,
 5. Germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting, provided that each lamp does not contain more than 2 grams of thorium,
 6. Rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these, or
 7. Personnel neutron dosimeters, provided that each dosimeter does not contain more than 50 milligrams of thorium.
- (2) Source material contained in the following products:
 1. Glazed ceramic tableware manufactured before November 5, 2014, provided that the glaze contains not more than 20 percent by weight source material,
 2. Glassware containing not more than 2 percent by weight source material or, for glassware manufactured before November 5, 2014, 10 percent by weight source material, but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic used in construction,
 3. Glass enamel or glass enamel frit containing not more than 10 percent by weight source material imported or ordered for importation into the United States, or initially distributed by manufacturers in the United States, before July 25, 1983, or
 4. Piezoelectric ceramic containing not more than 2 percent by weight source material.
- (3) Photographic film, negatives, and prints containing uranium or thorium.
- (4) Any finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed 4 percent by weight and that this exemption shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such product or part.
- (5) Uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of such counterweights, provided that:
 1. Reserved.
 2. Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM,"
 3. Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED," and
 4. This exemption shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such counterweights other than repair or restoration of any plating or other covering.
- (6) Natural or depleted uranium metal used as shielding constituting part of any shipping container, provided that:
 1. The shipping container is conspicuously and legibly impressed with the legend "CAUTION—RADIOACTIVE SHIELDING—URANIUM," and
 2. The uranium metal is encased in mild steel or equally fire-resistant metal of minimum wall thickness of 1/8 inch (3.2 mm).
- (7) Thorium or uranium contained in or on finished optical lenses and mirrors, provided that each lens or mirror does not contain more than 10 percent by weight of thorium or uranium or, for lenses manufactured before November 5, 2014, 30 percent by weight of thorium; and that this exemption does not authorize either:
 1. The shaping, grinding, or polishing of such lens or mirror or manufacturing processes other than the assembly of such lens or mirror into optical systems and devices without any alteration of the lens or mirror, or

2. The receipt, possession, use, or transfer of uranium or thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical instruments.

(8) Rescinded IAB 10/1/14, effective 11/5/14.

(9) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy, provided that:

1. The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide), and

2. The thorium content in the nickel-thoria alloy does not exceed 4 percent by weight.

d. The exemptions in 39.4(2) do not authorize the manufacture of any of the products described.

e. The requirements specified in 39.4(2) “c”(5) “2” and “3” need not be met by counterweights manufactured prior to December 31, 1969, provided that such counterweights are impressed with the legend, “CAUTION—RADIOACTIVE MATERIAL—URANIUM,” as previously required by the rules.

f. No person may initially transfer for sale or distribution a product containing source material to persons exempt under these rules, or equivalent regulations of an agreement state or the Nuclear Regulatory Commission, unless authorized by a license issued under 10 CFR 40.52 to initially transfer such products for sale or distribution.

(1) Persons initially transferring for sale or distributing source material in products covered by the exemptions in these rules before November 5, 2014, without specific authorization may continue such distribution for one year beyond this date. Initial distribution may also be continued until the Nuclear Regulatory Commission takes final action on a pending application for license or license amendment to specifically authorize distribution submitted no later than one year beyond this date.

(2) Persons authorized to manufacture, process, or produce these materials or products containing source material by the agency, an agreement state, or the Nuclear Regulatory Commission, and persons who import finished products or parts, for sale or distribution must be authorized by a license issued under 10 CFR 40.52 for distribution only and are exempt from the requirements of 641—Chapter 40 and 39.4(25) “a” and “b.”

39.4(3) Radioactive material other than source material.

a. Exempt concentrations.

(1) Except as provided in 39.4(3) “a”(2), any person is exempt from this chapter to the extent that such person receives, possesses, uses, transfers, owns or acquires products containing radioactive material introduced in concentrations not in excess of those listed in Appendix A of this chapter.

(2) No person may introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under 39.4(3) “a”(1) or equivalent regulations of the U.S. Nuclear Regulatory Commission, or any agreement state, except in accordance with a specific license issued pursuant to 10 CFR 32.11.

(3) An exemption is granted to persons who receive, possess, use, process, transfer, distribute, and dispose of materials containing or contaminated at concentrations less than 20 picocuries per gram of radium.

(4) This rule shall not be deemed to authorize the import of radioactive material or products containing radioactive material.

(5) A manufacturer, processor, or producer of a product or material is exempt from the requirements for a license and from these rules to the extent that the manufacturer, processor, or producer transfers radioactive material contained in a product or material in concentrations not in excess of the requirements in Appendix A of this chapter and introduced into the product or material by a licensee holding a specific license issued by the U.S. Nuclear Regulatory Commission expressly authorizing such introduction. This exemption does not apply to the transfer of radioactive material contained in any food, beverage, cosmetic, drug, or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

b. Exempt quantities.

(1) Except as provided in 39.4(3) “b”(3), (4), and (5), any person is exempt from the requirements for a license and from these rules to the extent that such person receives, possesses, uses, transfers, owns,

or acquires radioactive material in individual quantities, each of which does not exceed the applicable quantity set forth in Appendix B of this chapter.

(2) Any person who possesses radioactive material received or acquired under a general license is exempt from the requirements for a license set forth in this chapter to the extent that such person possesses, uses, transfers or owns such radioactive material.

(3) This paragraph (39.4(3) "b") does not authorize for purposes of commercial distribution the production, packaging, repackaging or transfer of radioactive material or the incorporation of radioactive material into products intended for commercial distribution.

(4) No person may, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in Appendix B of this chapter, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under 39.4(3) or equivalent regulations of the U.S. Nuclear Regulatory Commission, any agreement state or licensing state, except in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.18 of 10 CFR 32, which license states that the radioactive material may be transferred by the licensee to persons exempt under 39.4(3) "b" or the equivalent regulations of the U.S. Nuclear Regulatory Commission, an agreement state, or licensing state. Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing by-product material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

(5) No person may, for purposes of producing an increased radiation level, combine quantities of radioactive material covered by this exemption so that the aggregate quantity exceeds the limits set forth in Appendix B of this chapter, except for radioactive material combined within a device placed in use before May 3, 1999, or as otherwise permitted by the rules in this chapter.

c. Exempt items.

(1) Certain items containing radioactive material. Except for persons who apply radioactive material to or persons who incorporate radioactive material into the following products, or persons who initially transfer for sale or distribution the following products containing radioactive material, any person is exempt from the requirements for a license set forth in this chapter and from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires the following products:

1. Timepieces or hands or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified radiation dose rate:

- 25 millicuries (925 MBq) of tritium per timepiece;
- 5 millicuries (185 MBq) of tritium per hand;
- 15 millicuries (555 MBq) of tritium per dial (bezels when used shall be considered as part of the dial);
- 100 microcuries (3.7 MBq) of promethium-147 per watch or 200 microcuries (7.4 MBq) of promethium-147 per any other timepiece;
- 20 microcuries (0.74 MBq) of promethium-147 per watch hand or 40 microcuries (1.48 MBq) of promethium-147 per other timepiece hand;
- 60 microcuries (2.22 MBq) of promethium-147 per watch dial or 120 microcuries (4.44 MBq) of promethium-147 per other timepiece dial (bezels when used shall be considered as part of the dial);
- One microcurie (37 kBq) of radium-226 per timepiece in intact timepieces manufactured prior to November 30, 2007.

2. The radiation dose rate from hands and dials containing promethium-147 will not exceed, when measured through 50 milligrams per square centimeter of absorber:

- For wrist watches, 0.1 millirad (1 μ Gy) per hour at 10 centimeters from any surface.
- For pocket watches, 0.1 millirad (1 μ Gy) per hour at 1 centimeter from any surface.
- For any other timepiece, 0.2 millirad (2 μ Gy) per hour at 10 centimeters from any surface.

3. Precision balances containing not more than 1 millicurie (37 MBq) of tritium per balance or not more than 0.5 millicurie (18.5 MBq) of tritium per balance part manufactured before December 17, 2007.

4. Marine compasses containing not more than 750 millicuries (27.8 GBq) of tritium gas and other marine navigational instruments containing not more than 250 millicuries (9.25 GBq) of tritium gas manufactured before December 17, 2007.

5. Electron tubes, provided that each tube does not contain more than one of the following specified quantities of radioactive material:

- 150 millicuries (5.55 GBq) of tritium per microwave receiver protector tube or 10 millicuries (370 MBq) of tritium per any other electron tube;
- 1 microcurie (37 kBq) of cobalt-60;
- 5 microcuries (185 kBq) of nickel-63;
- 30 microcuries (1.11 MBq) of krypton-85;
- 5 microcuries (185 kBq) of cesium-137; and
- 30 microcuries (1.11 MBq) of promethium-147.

And provided further, that the radiation dose rate from each electron tube containing radioactive material will not exceed 1 millirad (10 μ Gy) per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber. For purposes of 39.4(3)“c”(1)“5,” the term “electron tubes” includes spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical currents.

6. Ionizing radiation measuring instruments, for purposes of internal calibration or standardization, containing one or more sources of radioactive material, provided that:

- Each source contains no more than one exempt quantity set forth in Appendix B of this chapter;
- Each device contains no more than ten exempt quantities. For purposes of this requirement, a device’s source(s) may contain either one type of or different types of radionuclides, and an individual exempt quantity may be composed of fractional parts of one or more of the exempt quantities in Appendix B of this chapter, provided that the sum of such fractions shall not exceed unity; or
- For americium-241, 0.05 microcurie (1.85 kBq) is considered an exempt quantity under 39.4(3)“c”(1)“6.”

7. Ionization chamber smoke detectors containing not more than 1 microcurie (μ Ci) of americium-241 per detector in the form of a foil and designed to protect life and property from fires.

Any person who desires to apply by-product material to, or to incorporate by-product material into, the products exempted in subparagraph 39.4(3)“c”(1), or who desires to initially transfer for sale or distribution such products containing by-product material, should apply for a specific license with the Nuclear Regulatory Commission pursuant to 10 CFR 32.14, which license states that the product may be distributed by the licensee to persons exempt from the regulations pursuant to subparagraph 39.4(3)“c”(1).

(2) Self-luminous products containing radioactive material.

1. Tritium, krypton-85, or promethium-147. Except for persons who manufacture, process, produce, or initially transfer for sale or distribution self-luminous products containing tritium, krypton-85, or promethium-147, any person is exempt from these rules to the extent that such person receives, possesses, uses, transfers, owns, or acquires tritium, krypton-85 or promethium-147 in self-luminous products manufactured, processed, produced, imported, or initially transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.22 of 10 CFR Part 32, which license authorizes the initial transfer of the product for use under these rules. Any person who desires to manufacture, process, produce or initially transfer for sale or distribution self-luminous products containing tritium, krypton-85, or promethium-147 for use according to this paragraph shall apply for a license under 10 CFR 32.22 and for a certificate of registration in accordance with 10 CFR 32.210. The exemption in 39.4(3)“c”(2) does not apply to tritium, krypton-85, or promethium-147 used in products primarily for frivolous purposes or in toys or adornments.

2. Radium-226. Any person is exempt from these rules to the extent that such person receives, possesses, uses, transfers, or owns articles containing less than 0.1 microcurie (3.7 kBq) of radium-226 which were acquired prior to the effective date of these rules.

(3) Gas and aerosol detectors containing radioactive material.

1. Except for persons who manufacture, process, produce, or initially transfer for sale or distribution gas and aerosol detectors containing radioactive material, any person is exempt from the requirements for a license set forth in this chapter and from the requirements contained in 641—Chapters 38, 40, and 41 to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material in gas and aerosol detectors designed to protect health, safety or property and manufactured, processed, produced, or initially transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to Section 32.26 of 10 CFR Part 32, which license authorizes the initial transfer of the product for use under this rule. This exemption also covers gas and aerosol detectors manufactured or distributed before November 20, 2007, in accordance with a specific license issued by a state under comparable provisions to 10 CFR 32.26 authorizing distribution to persons exempt from regulatory requirements.

2. Any person who desires to manufacture, process, or produce gas and aerosol detectors containing radioactive material, or to initially transfer such products for use pursuant to 39.4(3)“c”(3)“1,” shall apply for a license under 10 CFR 32.26 and for a certificate of registration in accordance with 10 CFR 32.210.

(4) 1. Static elimination devices which contain, as a sealed source or sources, by-product material consisting of a total of not more than 18.5 MBq (500 µCi) of polonium-210 per device.

2. Ion generating tubes designed for ionization of air that contain, as a sealed source or sources, by-product material consisting of a total of not more than 18.5 MBq (500 µCi) of polonium-210 per device or of a total of not more than 1.85 GBq (50 mCi) of hydrogen-3 (tritium) per device.

3. Such devices authorized before November 5, 2014, for use under the general license that was provided in 39.4(22)“a” and equivalent regulations of an agreement state or the Nuclear Regulatory Commission and manufactured, tested and labeled by the manufacturer in accordance with the specifications contained in a specific license issued by the agency.

(5) Radioactive drug: capsules containing carbon-14 urea for “in vivo” diagnostic use for humans.

1. Except as provided in paragraphs “b” and “c” of this subrule, any person is exempt from the requirements for a license set forth in this chapter and in 641—41.2(136C) provided that such person receives, possesses, uses, transfers, owns, or acquires capsules containing 37 kBq 1µCi carbon-14 urea (allowing for nominal variation that may occur during the manufacturing process) each, for “in vivo” diagnostic use for humans.

2. Any person who desires to use the capsules for research involving human subjects shall apply for and receive a specific license pursuant to 641—41.2(136C).

3. Any person who desires to manufacture, prepare, process, produce, package, repackage, or transfer for commercial distribution such capsules shall apply for and receive a specific license pursuant to 39.4(20) of this rule.

4. Nothing in this subrule relieves persons from complying with applicable FDA or other federal or state requirements governing receipt, administration, and use of drugs.

(6) Certain industrial devices. Except for persons who manufacture, process, produce, or initially transfer for sale or distribution industrial devices containing radioactive material designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing an ionized atmosphere, any person is exempt from the requirements for a license set forth in this chapter to the extent that such person receives, possesses, uses, transfers, owns, or acquires radioactive material, in these certain detecting, measuring, gauging, or controlling devices and certain devices for producing an ionized atmosphere, and manufactured, processed, produced, or initially transferred in accordance with a specific license issued under 10 CFR 32.30, which license authorizes the initial transfer of the device for use under these rules. This exemption does not cover sources not incorporated into a device, such as calibration and reference sources. Any person who desires to manufacture, process, produce, or initially transfer for sale or distribution industrial devices containing

by-product material for use under these rules should apply for a license under 10 CFR 32.30 and for a certificate of registration in accordance with 10 CFR 32.210.

39.4(4) to 39.4(19) Reserved.

39.4(20) *Types of licenses.* There are two types of licenses for radioactive materials: general and specific.

a. General licenses provided in this chapter are effective without the filing of applications with the agency or the issuance of licensing documents to the particular persons, although the filing of a certificate or registration application with the agency may be required by the particular general license. The general licensee is subject to all other applicable portions of these rules and any limitations of the general license.

b. Specific licenses require the submission of an application to the agency and the issuance of a licensing document by the agency. The licensee is subject to all applicable portions of these rules as well as any limitations specified in the licensing document.

c. All licensees and registrants must submit the appropriate fee in 641—subrule 38.8(2).

39.4(21) *General licenses—source material.*

a. A general license is hereby issued authorizing commercial and industrial firms, research, educational and medical institutions, and federal, state and local government agencies to receive, possess, use and transfer uranium and thorium, in their natural isotopic concentrations and in the form of depleted uranium, for research, development, educational, commercial, or operational purposes in the following forms and quantities:

(1) No more than 1.5 kg (3.3 lb) of uranium and thorium in dispersible forms (e.g., gaseous, liquid, powder, etc.) at any one time. Any material processed by the general licensee that alters the chemical or physical form of the material containing source material must be accounted for as a dispersible form. A person authorized to possess, use, and transfer source material under this paragraph may not receive more than a total of 7 kg (15.4 lb) of uranium and thorium in any one calendar year. Persons possessing source material in excess of these limits as of November 5, 2014, may continue to possess up to 7 kg (15.4 lb) of uranium and thorium at any one time for one year beyond this date, or until the agency takes final action on a pending application submitted on or before November 5, 2015, for a specific license for such material; and receive up to 70 kg (154 lb) of uranium or thorium in any one calendar year until December 31, 2014, or until the agency takes final action on a pending application submitted on or before November 5, 2015, for a specific license for such material; and

(2) No more than a total of 7 kg (15.4 lb) of uranium and thorium at any one time. A person authorized to possess, use, and transfer source material under this paragraph may not receive more than a total of 70 kg (154 lb) of uranium and thorium in any one calendar year. A person may not alter the chemical or physical form of the source material possessed under this paragraph unless it is accounted for under the limits of 39.4(21)“a”(1); or

(3) No more than 7 kg (15.4 lb) of uranium, removed during the treatment of drinking water, at any one time. A person may not remove more than 70 kg (154 lb) of uranium from drinking water during a calendar year under this paragraph; or

(4) No more than 7 kg (15.4 lb) of uranium and thorium at laboratories for the purpose of determining the concentration of uranium and thorium contained within the material being analyzed at any one time. A person authorized to possess, use, and transfer source material under this paragraph may not receive more than a total of 70 kg (154 lb) of source material in any one calendar year.

b. Any person who receives, possesses, uses, or transfers source material in accordance with the general license issued in 39.4(21)“a”:

(1) Is prohibited from administering source material, or the radiation therefrom, either externally or internally, to human beings except as may be authorized by the agency in a specific license.

(2) Shall not abandon such source material. Source material may be disposed of as follows:

1. A cumulative total of 0.5 kg (1.1 lb) of source material in a solid, nondispersible form may be transferred each calendar year, by a person authorized to receive, possess, use, and transfer source material under this general license to persons receiving the material for permanent disposal. The recipient of source material transferred under the provisions of this paragraph is exempt from the requirements to obtain a license under this chapter to the extent the source material is permanently disposed. This

provision does not apply to any person who is in possession of source material under a specific license issued under this chapter; or

2. In accordance with 641—40.70(136C).

(3) Is subject to the provisions in 641—38.4(136C), 641—38.9(136C), 39.4(21), 39.4(32) “a” through “d” and “f,” 39.4(41), 39.4(51), 39.4(52), 641—40.95(136C), 641—40.96(136C), and 641—40.97(136C).

(4) Reserved.

(5) Shall not export such source material except in accordance with 10 CFR Part 110.

c. Any person who receives, possesses, uses, or transfers source material in accordance with 39.4(21) “a” shall conduct activities so as to minimize contamination of the facility and the environment. When activities involving such source material are permanently ceased at any site, if evidence of significant contamination is identified, the general licensee shall notify the agency about such contamination and may consult with the agency as to the appropriateness of sampling and restoration activities to ensure that any contamination or residual source material remaining at the site where source material was used under this general license is not likely to result in exposures that exceed the limits in 641—40.29(136C).

d. A general license is hereby issued authorizing the receipt of title to source material without regard to quantity. This general license does not authorize any person to receive, possess, use, or transfer source material.

e. Depleted uranium in industrial products and devices.

(1) A general license is hereby issued to receive, acquire, possess, use, or transfer, in accordance with the provisions of 39.4(21) “e”(2), (3), (4), and (5), depleted uranium contained in industrial products or devices for the purpose of providing a concentrated mass in a small volume of the product or device.

(2) The general license in 39.4(21) “e”(1) applies only to industrial products or devices which have been manufactured either in accordance with a specific license issued to the manufacturer of the products or devices pursuant to 39.4(29) “m” or in accordance with a specific license issued to the manufacturer by the U.S. Nuclear Regulatory Commission or an agreement state which authorizes manufacture of the products or devices for distribution to persons generally licensed by the U.S. Nuclear Regulatory Commission or an agreement state.

(3) Persons who receive, acquire, possess, or use depleted uranium pursuant to the general license established by 39.4(21) “e”(1) shall file Agency Form “Registration Certificate—Use of Depleted Uranium Under General License” with the agency. The form shall be submitted within 30 days after the first receipt or acquisition of such depleted uranium. The general licensee shall furnish on the Agency Form “Registration Certificate—Use of Depleted Uranium Under a General License” the following information and such other information as may be required by that form:

- Name and address of the general licensee;
- A statement that the general licensee has developed and will maintain procedures designed to establish physical control over the depleted uranium described in 39.4(21) “e”(1) and designed to prevent transfer of such depleted uranium in any form, including metal scrap, to persons not authorized to receive the depleted uranium; and
- Name and title, address, and telephone number of the individual duly authorized to act for and on behalf of the general licensee in supervising the procedures identified in 39.4(21) “e”(3) “1.”

2. The general licensee possessing or using depleted uranium under the general license established by 39.4(21) “e”(1) shall report in writing to the agency any changes in information furnished by the general licensee in Agency Form “Registration Certificate—Use of Depleted Uranium Under General License.” The report shall be submitted within 30 days after the effective date of such change.

(4) A person who receives, acquires, possesses, or uses depleted uranium pursuant to the general license established by 39.4(21) “e”(1):

1. Shall not introduce such depleted uranium, in any form, into a chemical, physical, or metallurgical treatment or process, except a treatment or process for repair or restoration of any plating or other covering of the depleted uranium;

2. Shall not abandon such depleted uranium;

3. Shall transfer or dispose of such depleted uranium only by transfer in accordance with the provisions of 39.4(41). In the case where the transferee receives the depleted uranium pursuant to the general license established by 39.4(21)“e”(1), the transferor shall furnish the transferee a copy of 641—Chapter 39 and a copy of Agency Form “Registration Certificate—Use of Depleted Uranium Under General License.” In the case where the transferee receives the depleted uranium pursuant to a general license contained in the U.S. Nuclear Regulatory Commission’s or agreement state’s regulation equivalent to 39.4(21)“e”(1), the transferor shall furnish the transferee a copy of 641—Chapter 39 and a copy of the Agency Form “Registration Certificate—Use of Depleted Uranium Under General License” accompanied by a note explaining that use of the product or device is regulated by the U.S. Nuclear Regulatory Commission or agreement state under requirements substantially the same as those in 641—Chapters 38, 39, 40, 41 and 45;

4. Within 30 days of any transfer, shall report in writing to the agency the name and address of the person receiving the depleted uranium pursuant to such transfer; and

5. Shall not export such depleted uranium except in accordance with a license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 CFR Part 110.

(5) Any person receiving, acquiring, possessing, using, or transferring depleted uranium pursuant to the general license established by 39.4(21)“e”(1) is exempt from the requirements of 641—Chapter 40 with respect to the depleted uranium covered by that general license.

f. Any person who receives, possesses, uses, or transfers source material in accordance with the general license granted in 39.4(21)“a” is exempt from the provisions of 641—Chapter 40 to the extent that such receipt, possession, use, and transfer are within the terms of this general license, except that such person shall comply with the provisions of 641—40.29(136C) and 641—40.70(136C) to the extent necessary to meet the provisions of 39.4(21)“b”(2) and 39.4(21)“c.” However, this exemption does not apply to any person who also holds a specific license issued under this chapter.

g. No person may initially transfer or distribute source material to persons generally licensed under 39.4(21)“a”(1) and (2), or equivalent regulations of the Nuclear Regulatory Commission or an agreement state, unless authorized by a specific license issued in accordance with 39.4(39) or equivalent provisions of the Nuclear Regulatory Commission or an agreement state. This prohibition does not apply to analytical laboratories returning processed samples to the client who initially provided the sample. Initial distribution of source material to persons generally licensed by 39.4(21)“a” before November 5, 2014, without specific authorization may continue for one year beyond this date. Distribution may also be continued until the agency takes final action on a pending application for license or license amendment to specifically authorize distribution submitted on or before November 5, 2015.

39.4(22) General licenses—radioactive material other than source material. This subrule establishes general licenses for the possession and use of radioactive material and a general license for ownership of radioactive material. (Note: Different general licenses are issued in this subrule, each of which has its own specific conditions and requirements.)

a. Rescinded IAB 10/1/14, effective 11/5/14.

b. and c. Reserved.

d. Certain detecting, measuring, gauging, or controlling devices and certain devices for producing light or an ionized atmosphere.

(1) A general license is hereby issued to commercial and industrial firms and research, educational and medical institutions, individuals in the conduct of their business, and federal, state or local government agencies to acquire, receive, possess, use or transfer, in accordance with the provisions of 39.4(22)“d”(2), (3), and (4), radioactive material contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.

(2) The general license in 39.4(22)“d”(1) applies only to radioactive material contained in devices which have been manufactured or initially transferred and labeled in accordance with the specifications contained in a specific license by this agency issued under 39.4(29)“d”; or an equivalent specific license issued by the NRC or an agreement state or a licensing state; or an equivalent specific license issued

by a state with provisions comparable to 39.4(29) "d," which authorizes distribution of the devices. The devices must have been received from one of the specific licensees described in 39.4(22) "d"(2) or through a transfer made under 39.4(22) "d"(3).

(3) Any person who acquires, receives, possesses, uses or transfers radioactive material in a device pursuant to the general license in 39.4(22) "d"(1):

1. Shall ensure that all labels affixed to the device at the time of receipt and bearing a statement that removal of the label is prohibited are maintained thereon and shall comply with all instructions and precautions provided by such labels;

2. Shall ensure that the device is tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at no longer than six-month intervals or at such other intervals as are specified in the label; However,

- Devices containing only krypton need not be tested for leakage of radioactive material; and
- Devices containing only tritium or not more than 100 microcuries of other beta- or gamma-emitting material or both or 10 microcuries of alpha-emitting material and devices held in storage in the original shipping container prior to initial installation need not be tested for any purpose;

3. Shall ensure that the test required by 39.4(22) "d"(3) and other testing, installation, servicing, and removal from installation involving the radioactive material, its shielding or containment are performed:

- In accordance with the instructions provided by the labels; or
- By a person holding a specific license pursuant to 641—39.4(136C), the NRC, an agreement state or a licensing state to perform such activities;

4. Shall maintain records showing compliance with the requirements of 39.4(22) "d"(3). The records must show the results of tests. The records also must show the dates of performance of, and the names of persons performing, testing, installing, servicing, and removing from the installation radioactive material and its shielding or containment. The licensee shall retain these records as follows:

- Each record of a test for leakage or radioactive material required by 39.4(22) "d"(3) must be retained for three years after the next required leak test is performed or until the sealed source is transferred or disposed of;

- Each record of a test of the on-off mechanism and indicator required by 39.4(22) "d"(3) must be retained for three years after the next required test of the on-off mechanism and indicator is performed or until the sealed source is transferred or disposed of;

- Each record that is required by 39.4(22) "d"(3) must be retained for three years from the date of the recorded event or until the device is transferred or disposed of;

5. Shall immediately suspend operation of the device if there is a failure of, or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-off mechanism or indicator, or upon the detection of 0.005 microcurie (185 Bq) or more removable radioactive material. The device may not be operated until it has been repaired by the manufacturer or other person holding a specific license to repair such devices that was issued by this agency, the NRC, an agreement state or licensing state. The device and any radioactive material from the device may only be disposed of by transfer to a person authorized by a specific license to receive the radioactive material in the device or as otherwise approved by this agency. A report containing a brief description of the event and the remedial action taken, and in the case of detection of 0.005 microcurie (185 Bq) or more removable radioactive material or failure of or damage to a source likely to result in contamination of the premises or the environs, a plan for ensuring that the premises and environs are acceptable for unrestricted use, must be furnished to the agency within 30 days. Under these circumstances, the criteria set out in 641—40.29(136C) may be applicable, as determined by the agency on a case-by-case basis;

6. Shall not abandon the device containing radioactive material;

7. Shall not export the device containing radioactive material except in accordance with 10 CFR Part 110;

8. Shall transfer or dispose of the device containing radioactive material only by export as provided by 39.4(22) "d"(3) "7," by transfer to another general licensee as authorized in 39.4(22) "d"(3) "9," to a person authorized to receive the device by a specific license issued by the agency, the NRC, an agreement

state or a licensing state whose specific license authorizes the person to receive the device or which authorizes waste collection, or as otherwise approved under 39.4(22) "d"(3):

- Shall furnish a report to this agency within 30 days after the transfer of a device to a specific licensee or export. The report must contain the identification of the device by manufacturer's (or initial transferor's) name, model number, and serial number; the name, address and license number of the person receiving the device (license number not applicable if device is exported); and the date of the transfer;

- Shall obtain written agency approval before transferring the device to any other specific licensee not specifically identified in 39.4(22) "d"; however, a holder of a specific license may transfer a device for possession and use under its own specific license without prior approval if the holder:

- Verifies that the specific license authorizes the possession and use, or applies for and obtains an amendment to the license authorizing the possession and use;

- Removes, alters, covers, or clearly and unambiguously augments the existing label (otherwise required by 39.4(22) "d"(3)"1") so that the device is labeled in compliance with 641—40.63(136C) of these rules; however the manufacturer, model number, and serial number must be retained;

- Obtains manufacturer's or initial transferor's information concerning maintenance that would be applicable under the specific license (such as leak-testing procedures); and

- Reports the transfer under 39.4(22) "d"(3)"8" of this chapter.

9. Shall transfer the device to another general licensee only if:

- The device remains in use at a particular location. In this case, the transferor shall give the transferee a copy of these rules and any safety documents identified in the label of the device. Within 30 days of the transfer, the transferor shall report to this agency the manufacturer's (or initial transferor's) name; the model number and the serial number of the device transferred; the transferee's name and mailing address for the location of use; and the name, title, and telephone number of the responsible individual identified by the transferee in accordance with 39.4(22) "d"(3)"12" to have knowledge of and authority to take actions to ensure compliance with the appropriate rules and requirements; or

- The device is held in storage, by an intermediate person, in the original shipping container at its intended location of use prior to initial use by a general licensee;

10. Shall comply with the provisions of 641—40.95(136C) and 641—40.96(136C), but shall be exempt from the other requirements of 641—Chapter 40;

11. Shall respond to written requests from this agency to provide information relating to the general license within 30 calendar days of the date of the request, or other item specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by submitting a letter to the agency and providing written justification as to why it cannot comply;

12. Shall appoint an individual responsible for having knowledge of the appropriate rules and requirements and the authority for taking required actions to comply with appropriate rules and requirements. The general licensee, through this individual, shall ensure the day-to-day compliance with appropriate rules and requirements. This appointment does not relieve the general licensee of any of its responsibility in this regard;

13. Shall register as follows:

- Shall register devices as approved in the Sealed Source Device Registry. Each address for a location of use, as described in 39.4(22) "d"(3)"13," represents a separate general licensee and requires a separate registration and fee;

- If in possession of devices meeting the criteria of 39.4(22) "d"(3)"13," shall register these devices annually with the agency and shall pay the fee required in 641—paragraph 38.8(2) "c." Registration must be done by verifying, correcting, and adding to the information provided in a request for registration received from the agency. The registration information must be submitted 30 days from the date of the request for registration or as otherwise indicated in the request. In addition, a general licensee holding devices meeting the criteria of 39.4(22) "d"(3)"13" is subject to the bankruptcy notification requirement of 39.4(32) "e";

- In registering devices, the general licensee shall furnish the following information and any other information specifically requested by the agency:

- Name and mailing address of the general licensee;

- Information about each device: the manufacturer (or initial transferor), model number, serial number, the radioisotope and activity (as indicated on the label);

- Name, title, and telephone number of the responsible person designated as a representative of the general licensee;

- Address or location at which the device(s) is both used and stored. For portable devices, the address of the primary place of storage;

- Certification by the responsible representative of the general licensee that the information concerning the device(s) has been verified through a physical inventory and check of label information.

- Certification by the responsible representative of the general licensee that the licensee is aware of the requirements of the general license.

- Persons generally licensed by this agency under 39.4(22) “d”(3)“13” or an agreement state are not subject to registration requirements of 39.4(22) “d”(3)“13” if the devices are used in areas subject to this agency’s jurisdiction for a period of less than 180 days in any calendar year. The agency will not request registration information from such licensees;

14. Shall report changes to the mailing address for the location of use (including change in name of general licensee) to the agency within 30 days of the effective date of the change. For a portable device, a report of address change is only required for a change in the device’s primary place of storage; and

15. May not hold devices that are not in use for longer than two years. If devices with shutters are not being used, the shutter must be locked in the closed position. The testing required by 39.4(22) “d” need not be performed during the period of storage only. However, when devices are put back into service or transferred to another person, and have not been tested within the required test interval, they must be tested for leakage before use or transfer and the shutter tested before use. Devices kept in standby for future use are excluded from the two-year time limit if the general licensee performs quarterly physical inventories of these devices while they are in standby.

(4) The general license in 39.4(22) “d”(1) does not authorize the manufacture or import of devices containing radioactive material.

(5) A general license to install devices generally licensed in 39.4(22) “d.” Any person who holds a specific license issued by an agreement state authorizing the holder to manufacture, install, or service a device described in 39.4(22) “d” within such agreement state is hereby granted a general license to install and service such device in any non-agreement state and a general license to install and service such device in offshore waters, as defined in 641—45.1(136C), provided that:

1. The device has been manufactured, labeled, installed, and serviced in accordance with the applicable provision of the specific license issued to such person by the agreement state, and

2. Such person ensures that any labels required to be affixed to the device under regulations of the agreement state which licensed manufacture of the device bear a statement that removal of the label is prohibited.

e. Luminous safety devices for aircraft.

(1) A general license is hereby issued to own, receive, acquire, possess, and use tritium or promethium-147 contained in luminous safety devices for use in aircraft, provided:

1. Each device contains not more than 10 curies (370 GBq) of tritium or 300 millicuries (11.1 GBq) of promethium-147; and

2. Each device has been manufactured, assembled or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or each device has been manufactured or assembled in accordance with the specifications contained in a specific license issued by the agency or any agreement state to the manufacturer or assembler of such device pursuant to licensing requirements equivalent to those in Section 32.53 of 10 CFR Part 32.

(2) Persons who own, receive, acquire, possess, or use luminous safety devices pursuant to the general license in 39.4(22) “e”(1) are exempt from the requirements of 641—Chapter 40 except that they shall comply with the provisions of 641—40.95(136C) and 40.96(136C).

(3) This general license does not authorize the manufacture, assembly, or repair of luminous safety devices containing tritium or promethium-147.

(4) This general license does not authorize the ownership, receipt, acquisition, possession or use of promethium-147 contained in instrument dials.

(5) This general license is subject to the provisions of 641—38.4(136C) to 641—38.5(136C), 39.4(32), 39.4(41), 39.4(51), and 641—39.5(136C).

f. Ownership of radioactive material. A general license is hereby issued to own radioactive material without regard to quantity. Notwithstanding any other provisions of this chapter, this general license does not authorize the manufacture, production, transfer, receipt, possession or use of radioactive material.

g. Calibration and reference sources.

(1) A general license is hereby issued to those persons listed below to own, receive, acquire, possess, use, and transfer, in accordance with the provisions of 39.4(22) “g”(4) and (5), americium-241 in the form of calibration or reference sources:

1. Any person who holds a specific license issued by the agency which authorizes the person to receive, possess, use, and transfer radioactive material; and

2. Any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission which authorizes the person to receive, possess, use, and transfer special nuclear material.

(2) A general license is hereby issued to own, receive, possess, use, and transfer plutonium in the form of calibration or reference sources in accordance with the provisions of 39.4(22) “g”(4) and (5) to any person who holds a specific license issued by the agency which authorizes the person to receive, possess, use, and transfer radioactive material.

(3) A general license is hereby issued to own, receive, possess, use, and transfer radium-226 in the form of calibration or reference sources in accordance with the provisions of 39.4(22) “g”(4) and (5) to any person who holds a specific license issued by the agency which authorizes the person to receive, possess, use, and transfer radioactive material.

(4) The general licenses in 39.4(22) “g”(1), (2), and (3) apply only to calibration or reference sources which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer or importer of the sources by the U.S. Nuclear Regulatory Commission pursuant to Section 32.57 of 10 CFR Part 32 or Section 70.39 of 10 CFR Part 70 or which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer by the agency, any agreement state or licensing state pursuant to licensing requirements equivalent to those contained in Section 32.57 of 10 CFR Part 32 or Section 70.39 of 10 CFR Part 70.

(5) The general licenses provided in 39.4(22) “g”(1), (2), and (3) are subject to the provisions of 641—38.4(136C) to 641—38.5(136C), 39.4(32), 39.4(41), 39.4(51), 641—39.5(136C), and 641—Chapter 40. In addition, persons who own, receive, acquire, possess, use, or transfer one or more calibration or reference sources pursuant to these general licenses:

1. Shall not possess at any one time, at any one location of storage or use, more than 5 microcuries (185 kBq) of americium-241, 5 microcuries (185 kBq) of plutonium, or 5 microcuries (185 kBq) of radium-226 in such sources;

2. Shall not receive, possess, use, or transfer such source unless the source, or the storage container, bears a label which includes one of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, as appropriate:

• The receipt, possession, use and transfer of this source, Model _____, Serial No. _____, are subject to a general license and the regulations of the U.S. Nuclear Regulatory Commission or of a state with which the Commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

CAUTION—RADIOACTIVE MATERIAL—THIS SOURCE CONTAINS (AMERICIUM-241).
(PLUTONIUM) (showing only the name of the appropriate material) DO NOT TOUCH
RADIOACTIVE PORTION OF THIS SOURCE.

Name of manufacturer or importer

OR

• The receipt, possession, use and transfer of this source, Model _____, Serial No. _____, are subject to a general license and the regulations of a licensing state. Do not remove this label.

CAUTION—RADIOACTIVE MATERIAL—THIS SOURCE CONTAINS RADIUM-226.
DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.

Name of manufacturer or importer

3. Shall not transfer, abandon, or dispose of such source except by transfer to a person authorized by a license from the agency, the U.S. Nuclear Regulatory Commission, an agreement state or a licensing state to receive the source;

4. Shall store such source, except when the source is being used, in a closed container adequately designed and constructed to contain americium-241, plutonium, or radium-226 which might otherwise escape during storage; and

5. Shall not use such source for any purpose other than the calibration of radiation detectors or the standardization of other sources.

(6) These general licenses do not authorize the manufacture of calibration or reference sources containing americium-241, plutonium, or radium-226.

h. Reserved.

i. General license for use of radioactive material for certain in vitro clinical or laboratory testing. The New Drug Provisions of the Federal Food, Drug, and Cosmetic Act also govern the availability and use of any specific diagnostic drugs in interstate commerce.

(1) A general license is hereby issued to any physician, veterinarian, clinical laboratory or hospital to receive, acquire, possess, transfer or use, for any of the following stated tests, in accordance with the provisions of 39.4(22) "i"(2), (3), (4), (5), and (6), the following radioactive materials in prepackaged units for use in in vitro clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation therefrom, to human beings or animals:

1. Carbon-14, in units not exceeding 10 microcuries (370 kBq) each.
2. Cobalt-57, in units not exceeding 10 microcuries (370 kBq) each.
3. Hydrogen-3 (tritium), in units not exceeding 50 microcuries (1.85 MBq) each.
4. Iodine-125, in units not exceeding 10 microcuries (370 kBq) each.
5. Mock iodine-125 reference or calibration sources, in units not exceeding 0.05 microcurie (1.85 kBq) of iodine-129 and 0.005 microcurie (1.85 Bq) of americium-241 each.
6. Iodine-131, in units not exceeding 10 microcuries (370 kBq) each.
7. Iron-59, in units not exceeding 20 microcuries (740 kBq) each.
8. Selenium-75, in units not exceeding 10 microcuries (370 kBq) each.

(2) No person shall receive, acquire, possess, use or transfer radioactive material pursuant to the general license established by 39.4(22) "i"(1) until the person has filed an Agency Form "Certificate—In Vitro Testing with Radioactive Material Under General License" with the agency and received from the agency a validated copy of the form with certification number assigned. The physician, veterinarian, clinical laboratory or hospital shall furnish the following information on the form and such other information as may be required by the form:

1. Name and address of the physician, veterinarian, clinical laboratory or hospital;
2. The location of use; and
3. A statement that the physician, veterinarian, clinical laboratory or hospital has appropriate radiation measuring instruments to carry out in vitro clinical or laboratory tests with radioactive material as authorized under the general license in 39.4(22) "i"(1) and that such tests will be performed only by personnel competent in the use of such instruments and in the handling of the radioactive material.

(3) A person who receives, acquires, possesses or uses radioactive material pursuant to the general license established by 39.4(22) "i"(1) shall comply with the following:

1. The general licensee shall not possess at any one time, pursuant to the general license in 39.4(22) "i"(1), at any one location of storage or use, a total amount of iodine-125, iodine-131, selenium-75, iron-59, or cobalt-57 in excess of 200 microcuries (7.4 MBq).

2. The general licensee shall store the radioactive material, until used, in the original shipping container or in a container providing equivalent radiation protection.

3. The general licensee shall use the radioactive material only for the uses authorized by 39.4(22) "i"(1).

4. The general licensee shall not transfer the radioactive material to a person who is not authorized to receive it pursuant to a license issued by the agency, the U.S. Nuclear Regulatory Commission, any agreement state or licensing state, nor transfer the radioactive material in any manner other than in the unopened, labeled shipping container as received from the supplier.

5. The general licensee shall dispose of the mock iodine-125 reference or calibration sources described in 39.4(22) "i"(1)"8" as required by 641—subrule 40.70(1).

(4) The general licensee shall not receive, acquire, possess, or use radioactive material pursuant to 39.4(22) "i"(1):

1. Except as prepackaged units which are labeled in accordance with the provisions of an applicable specific license issued pursuant to 39.4(29) "h" or in accordance with the provisions of a specific license issued by the U.S. Nuclear Regulatory Commission, any agreement state or licensing state which authorizes the manufacture and distribution of iodine-125, iodine-131, carbon-14, hydrogen-3 (tritium), iron-59, selenium-75, cobalt-57, or mock iodine-125 to persons generally licensed under 39.4(22) "i" or its equivalent, and

2. Unless one of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

- This radioactive material shall be received, acquired, possessed, and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the U.S. Nuclear Regulatory Commission or of a state with which the Commission has entered into an agreement for the exercise of regulatory authority.

Name of manufacturer

- This radioactive material shall be received, acquired, possessed, and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of a licensing state.

Name of manufacturer

(5) The physician, veterinarian, clinical laboratory or hospital possessing or using radioactive material under the general license of 39.4(22) "i"(1) shall report in writing to the agency any changes in the information furnished in the "Certificate—In Vitro Testing with Radioactive Material Under General License," Agency Form V. The report shall be furnished within 30 days after the effective date of such change.

(6) Any person using radioactive material pursuant to the general license of 39.4(22) "i"(1) is exempt from the requirements of 641—Chapter 40 with respect to radioactive material covered by that general license, except that such persons using the mock iodine-125 described in 39.4(22) "i"(1)"8" shall comply with the provisions of 641—subrule 40.70(1) and rules 40.95(136C) and 40.96(136C).

j. Ice detection devices.

(1) A general license is hereby issued to own, receive, acquire, possess, use, and transfer strontium-90 contained in ice detection devices, provided each device contains not more than 50 microcuries (1.85 MBq) of strontium-90 and each device has been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission or each device has been manufactured in accordance with the specifications contained in a specific license issued by the agency or an agreement state to the manufacturer of such device pursuant to licensing requirements equivalent to those in Section 32.61 of 10 CFR Part 32.

(2) Persons who own, receive, acquire, possess, use, or transfer strontium-90 contained in ice detection devices pursuant to the general license in 39.4(22) “j”(1):

1. Shall, upon occurrence of visually observable damage such as a bend or crack or discoloration from overheating to the device, discontinue use of the device until it has been inspected, tested for leakage and repaired by a person holding a specific license from the U.S. Nuclear Regulatory Commission or an agreement state to manufacture or service such devices; or shall dispose of the device pursuant to the provisions of 641—subrule 40.70(1);

2. Shall ensure that all labels affixed to the device at the time of receipt, and which bear a statement which prohibits removal of the labels, are maintained thereon; and

3. Are exempt from the requirements of 641—Chapter 40 except that such persons shall comply with the provisions of 641—subrule 40.70(1), and rules 40.95(136C) and 40.96(136C).

(3) This general license does not authorize the manufacture, assembly, disassembly or repair of strontium-90 in ice detection devices.

(4) This general license is subject to the provisions of 641—38.4(136C) to 641—38.5(136C), 39.4(32), 39.4(41), 39.4(51), and 641—39.5(136C).

k. Certain items and self-luminous products containing radium-226.

(1) A general license is hereby issued to any person to acquire, receive, possess, use, or transfer, in accordance with 39.4(22) “k”(2), (3), and (4), radium-226 contained in the following products manufactured prior to November 30, 2007.

1. Antiquities originally intended for use by the general public. For the purposes of this subrule, “antiquities” means products originally intended for use by the general public and distributed in the late nineteenth and early twentieth centuries including, but not limited to, radium emanator jars, revigators, radium water jars, radon generators, refrigerator cards, radium bath salts, and healing pads.

2. Intact and non-intact timepieces containing greater than 1 microcurie (0.037 megabecquerel), and timepiece hands and dials no longer installed in timepieces.

3. Luminous items installed in air, marine, or land vehicles.

4. All other luminous products, provided that no more than 100 items are used or stored at the same location at any one time.

5. Small radium sources containing no more than 1 microcurie (0.037 megabecquerel) of radium-226. For the purposes of this subrule, “small radium sources” means discrete survey instrument check sources, sources contained in radiation measuring instruments, sources used in educational demonstrations (such as cloud chambers and spinthariscopes), electron tubes, lightning rods, ionization sources, static eliminators, or as designated by the agency.

(2) Persons who acquire, receive, possess, use, or transfer by-product material under the general license issued in 39.4(22) “k”(1) shall comply with the provisions of 641—40.95(136C) and 641—40.96(136C), but shall be exempt from the other requirements of 641—Chapter 40, to the extent that the receipt, possession, use, or transfer of by-product material is within the terms of the general license; provided, however, that this exemption shall not be deemed to apply to any such person specifically licensed under 39.4(24).

(3) Any person who acquires, receives, possesses, uses, or transfers by-product material in accordance with the general license in 39.4(22) “k”(1) shall:

1. Notify the agency if there is any indication of possible damage to the product which could result in a loss of the radioactive material. A report containing a brief description of the event and the remedial action taken must be furnished to the Iowa Department of Public Health, Bureau of Radiological Health, Lucas State Office Building, 5th Floor, 321 East 12th Street, Des Moines, Iowa, within 30 calendar days.

2. Not abandon products containing radium-226. The product, and any radioactive material from the product, may only be disposed of according to 641—40.77(136C) or by transfer to a person authorized by a specific license to receive the radium-226 in the product or as otherwise approved by the agency.

3. Not export products containing radium-226 except in accordance with 10 CFR Part 110.

4. Dispose of products containing radium-226 at a disposal facility authorized to dispose of radioactive material in accordance with any federal or state solid or hazardous waste law, including the Solid Waste Disposal Act, as authorized under the Energy Policy Act of 2005, by transfer to a person authorized to receive radium-226 by a specific license issued under 39.4(24), or equivalent NRC or agreement state requirements, or as otherwise approved by the agency.

5. Respond in writing to a written request from the agency to provide information relating to the general license within 30 calendar days of the request, or other time specified in the request.

(4) The general license in 39.4(22)“k”(1) does not authorize the manufacture, assembly, disassembly, repair, or import of products containing radium-226, except that timepieces may be disassembled and repaired.

39.4(23) Reserved.

39.4(24) *Filing application for specific licenses.*

a. Applications for specific licenses shall be filed on a form prescribed by the agency and include the fee required in 641—subrule 38.8(2).

b. The agency may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the agency to determine whether the application should be granted or denied or whether a license should be modified or revoked.

c. Each application shall be signed by the applicant or licensee or a person duly authorized to act for and on the applicant’s or licensee’s behalf.

d. An application for a license may include a request for a license authorizing one or more activities.

e. Applications and documents submitted to the agency may be made available for public inspection except that the agency may withhold any document or part thereof from public inspection if disclosure of its content is not required in the public interest and would adversely affect the interest of a person concerned.

f. (1) Each application to possess radioactive materials in unsealed form, on foils or plated sources, or sealed in glass in excess of the quantities in Appendix G of this chapter, must contain either:

1. An evaluation showing that the maximum dose to a person offsite due to a release of radioactive materials would not exceed 1 rem effective dose equivalent or 5 rems to the thyroid; or

2. An emergency plan for responding to a release of radioactive material.

(2) One or more of the following factors may be used to support an evaluation submitted under 39.4(24)“f”(1)“1” of this subrule:

1. The radioactive material is physically separated so that only a portion could be involved in an accident;

2. All or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;

3. The release fraction in the respirable size range would be lower than the release fraction shown in Appendix G due to the chemical or physical form of the material;

4. The solubility of the radioactive material would reduce the dose received;

5. Facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in Appendix G;

6. Operating restrictions or procedures would prevent a release fraction as large as that shown in Appendix G; or

7. Other factors appropriated for the specific facility.

(3) An emergency plan for responding to a release of radioactive material submitted under 39.4(24)“f”(1)“2” must include the following information:

1. Facility description. A brief description of the licensee’s facility and area near the site.

2. Types of accidents. An identification of each type of radioactive materials accident for which protective actions may be needed.

3. Classification of accidents. A classification system for classifying accidents as alerts or site area emergencies.

4. Detection of accidents. Identification of the means of detecting each type of accident in a timely manner.

5. Mitigation of consequences. A brief description of the means and equipment for mitigating the consequences of each type of accident, including those provided to protect workers onsite, and a description of the program for maintaining the equipment.

6. Assessment of releases. A brief description of the methods and equipment to assess releases of radioactive materials.

7. Responsibilities. A brief description of the responsibilities of licensee personnel should an accident occur, including identification of personnel responsible for promptly notifying offsite response organizations and the agency; also, responsibilities for developing, maintaining, and updating the plan.

8. Notification and coordination. A commitment to and a brief description of the means to promptly notify offsite response organizations and request offsite assistance, including medical assistance for the treatment of contaminated injured onsite workers when appropriate. A control point must be established. The notification and coordination must be planned so that unavailability of some equipment will not prevent the notification and coordination. The licensee shall also commit to notify the agency immediately after notification of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.

9. Information to be communicated. A brief description of the types of information of facility status, radioactive releases, and recommended protective actions, if necessary, to be given to offsite response organizations and to the agency.

10. Training. A brief description of the frequency, performance objectives and plans for the training that the licensee will provide workers on how to respond to an emergency including any special instructions and orientation tours the licensee would offer to fire, police, medical, and other emergency personnel. The training shall familiarize personnel with site-specific emergency procedures. Also, the training shall thoroughly prepare site personnel for their responsibilities in the event of accident scenarios postulated as most probable for the specific site, including the use of team training for such scenarios.

11. Safe shutdown. A brief description of the means of restoring the facility to a safe condition after an accident.

12. Exercises. Provisions for conducting quarterly communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Quarterly communications checks with offsite response organizations must include the check and update of all necessary telephone numbers. The licensee shall invite offsite response organizations to participate in the biennial exercises. Participation of offsite response organizations in biennial exercises although recommended is not required. Exercises must use accident scenarios postulated as most probable for the specific site and the scenarios shall not be known to most exercise participants. The licensee shall critique each exercise using individuals not having direct implementation responsibility for the plan. Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response. Deficiencies found by the critiques must be corrected.

13. Hazardous chemicals. A certification that the applicant has met its responsibilities under the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Pub.L.No. 99-499, if applicable to the applicant's activities at the proposed place of use of the radioactive material.

(4) The licensee shall allow the offsite response organizations expected to respond in case of an accident 60 days to comment on the licensee's emergency plan before submitting it to the agency. The licensee shall provide any comments received within the 60 days to the agency with the emergency plan.

g. (1) Except as provided in 39.4(24) “g”(2), (3), and (4), an application for a specific license to use radioactive material in the form of a sealed source or in a device that contains the sealed source must either:

1. Identify the source or device by manufacturer and model number as registered with the Nuclear Regulatory Commission under 10 CFR 32.210 or with an agreement state, or for a source or a device containing radium-226 or accelerator-produced radioactive material as registered with a state under provisions comparable to 10 CFR 32.210; or

2. Contain the information identified in 10 CFR 32.210(c).

(2) For sources or devices manufactured prior to November 5, 2014, that are not registered with the Nuclear Regulatory Commission under 10 CFR 32.210 or with an agreement state, and for which the applicant is unable to provide all the categories of information specified in 10 CFR 32.210(c), the application must include:

1. All available information identified in 10 CFR 32.210(c) concerning the source and, if applicable, the device; and

2. Sufficient additional information to demonstrate that there is reasonable assurance that the radiation safety properties of the source or device are adequate to protect health and minimize danger to life and property. Such information must include a description of the source or device, a description of radiation safety features, the intended use and associated operating experience, and the results of a current leak test.

(3) For sealed sources and devices allowed to be distributed without registration of safety information in accordance with 10 CFR 32.210(g)(1), the applicant may supply only the manufacturer, model number, and radionuclide and quantity.

(4) If it is not feasible to identify each sealed source and device individually, the applicant may propose constraints on the number and type of sealed sources and devices to be used and the conditions under which they will be used, in lieu of identifying each sealed source and device.

h. An application from a medical facility or an educational institution to produce positron emission tomography (PET) radioactive drugs for noncommercial transfer to licensees in the facility’s or educational institution’s consortium authorized for medical use under 641—41.2(136C) or equivalent NRC or agreement state requirements shall include:

(1) A request for authorization for the production of PET radionuclides or evidence of an existing license issued under this chapter or equivalent NRC or agreement state requirements for a PET production facility within its consortium from which it receives PET radionuclides.

(2) Evidence that the applicant is qualified to produce radioactive drugs for medical use by meeting one of the criteria in 39.4(29) “j”(1)“2.”

(3) Identification of the individual(s) authorized to prepare the PET radioactive drugs if the applicant is a pharmacy, and documentation that each individual meets the requirements of an authorized nuclear pharmacist as specified in 39.4(29) “j”(2)“2.”

(4) Information identified in 39.4(29) “j”(1)“3” on the PET drugs to be noncommercially transferred to members of the facility’s consortium.

39.4(25) General requirements for the issuance of specific licenses. A license application will be approved if the agency determines that:

a. The applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with 641—Chapters 38, 39, 40, 41 and 45 in such a manner as to minimize danger to public health and safety or property;

b. The applicant’s proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property;

c. The issuance of the license will not be inimical to the health and safety of the public; and

d. The applicant satisfies any applicable special requirements in 39.4(26), 39.4(27), 39.4(28), 641—41.2(136C), or 641—Chapter 45.

e. In the case of an application for a license to receive and possess radioactive material for commercial waste disposal by land burial, or for the conduct of any other activity which the agency determines will significantly affect the quality of the environment, the agency, before commencement

of construction of the plant or facility in which the activity will be conducted, has concluded, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. Commencement of construction prior to such conclusion shall be grounds for denial of a license to receive and possess radioactive material in such plant or facility. As used in this paragraph, the term "commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the environment of a site. The term does not mean site exploration, necessary roads for site exploration, borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the suitability of the site or the protection of environmental values.

39.4(26) Financial assurance and record keeping for decommissioning.

a. Each applicant for a specific license authorizing the possession and use of unsealed radioactive material of half-life greater than 120 days and in quantities exceeding $1.0E^5$ times the applicable quantities set forth in Appendix F of 641—Chapter 40 shall submit a decommissioning funding plan as described in 39.4(26) "e." The decommissioning funding plan must also be submitted when a combination of isotopes is involved if R divided by 10^5 is greater than 1 (unity rule), where R is defined here as the sum of the ratios of the quantity of each isotope to the applicable value in Appendix F.

b. (1) Each holder of or applicant for a specific license authorizing possession and use of sealed sources or plated foils of half-life greater than 120 days and in quantities exceeding 10^{12} times the applicable quantities set forth in 39.4(26) "d" (or when a combination of isotopes is involved if R , as defined in 39.4(26) "a," divided by 10^{12} is greater than 1) shall submit a decommissioning funding plan as described in 39.4(26) "e."

(2) Each applicant for a specific license authorizing possession and use of radioactive material of half-life greater than 120 days and in quantities specified in 39.4(26) "d" shall either:

1. Submit a decommissioning funding plan as described in 39.4(26) "e"; or

2. Submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by 39.4(26) "d" using one of the methods described in 39.4(26) "f." For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material. If the applicant defers execution of the financial instrument until after the license has been issued, a signed original of the financial instrument obtained to satisfy the requirements of 39.4(26) "f" must be submitted before receipt of licensed material. If the applicant does not defer execution of the financial instrument, the applicant shall submit, as part of the certification, a signed original of the financial instrument obtained to satisfy the requirements of 39.4(26) "f."

c. (1) Each holder of a specific license issued on or after July 1, 1993, which is of a type described in 39.4(26) "a" or "b," shall provide financial assurance for decommissioning in accordance with the criteria set forth in this subrule.

(2) Each holder of a specific license issued before July 1, 1993, and of a type described in 39.4(26) "a," shall submit, on or before January 1, 2007, a decommissioning funding plan or a certification of financial assurance for decommissioning in an amount at least equal to \$1,125,000 in accordance with the criteria set forth in this subrule. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan at this time, the licensee shall include a decommissioning funding plan in any application for license renewal.

(3) Each holder of a specific license issued before September 30, 1992, and of a type described in 39.4(36) "b," shall submit, on or before July 1, 1993, a certificate of financial assurance for decommissioning or a decommissioning funding plan in accordance with the criteria set forth in this subrule.

(4) Any licensee who submitted an application before July 1, 2003, for renewal of license shall provide financial assurance for decommissioning in accordance with 39.4(26) "a" and "b."

(5) Waste collectors and waste processors must provide financial assurance in an amount based on a decommissioning funding plan as described in 39.4(26) "e." The decommissioning funding plan must include the cost of disposal of the maximum amount (curies) of radioactive material permitted by license,

and the cost of disposal of the maximum quantity, by volume, of radioactive material which could be present at the licensee’s facility at any time, in addition to the cost to remediate the licensee’s site to meet the license termination criteria of 641—Chapters 39 and 40.

(6) If, in surveys made under 641—subrule 40.36(1), residual radioactivity in the facility and the environment, including the subsurface, is detected at levels that would, if left uncorrected, prevent the site from meeting the 641—40.29(136C) criteria for unrestricted use, the licensee must submit a decommissioning funding plan within one year of when the survey is completed.

d. Table of required amounts of financial assurance for decommissioning by quantity of material.

| | |
|--|-----------|
| Greater than 10 ⁴ but less than or equal to 10 ⁵ times the applicable quantities of Appendix F of 641—Chapter 40 in unsealed form. (For a combination of isotopes, if R, as defined in 39.4(26) “a,” divided by 10 ⁴ is greater than 1, but R divided by 10 ⁵ is less than or equal to 1.) | 1,125,000 |
|--|-----------|

| | |
|--|---------|
| Greater than 10 ³ but less than or equal to 10 ⁴ times the applicable quantities of Appendix F of 641—Chapter 40 in unsealed form. (For a combination of isotopes, if R, as defined in 39.4(26) “a,” divided by 10 ³ is greater than 1, but R divided by 10 ⁴ is less than or equal to 1.) | 225,000 |
|--|---------|

| | |
|---|---------|
| Greater than 10 ¹⁰ but less than or equal to 10 ¹² times the applicable quantities of Appendix F or 641—Chapter 40 in sealed sources or plated foils. (For a combination of isotopes, if R, as defined in 39.4(26) “a,” divided by 10 ¹⁰ is greater than 1, but R divided by 10 ¹² is less than or equal to 1.) | 113,000 |
|---|---------|

Licensees having possession limits exceeding the upper bounds of this table must base financial assurance on a decommissioning funding plan

e. (1) Each decommissioning funding plan must be submitted for review and approval and must contain:

1. A detailed cost estimate for decommissioning, in an amount reflecting:
 - The cost of an independent contractor to perform all decommissioning activities;
 - The cost of meeting the 641—40.29(136C) criteria for unrestricted use, provided that, if the applicant or licensee can demonstrate its ability to meet the provisions of 641—40.30(136C), the cost estimate may be based on meeting the 641—40.30(136C) criteria;
 - The volume of onsite subsurface material containing residual radioactivity that will require remediation to meet the criteria for license termination; and
 - An adequate contingency factor;
2. Identification of and justification for using the key assumptions contained in the decommissioning cost estimate (DCE);
3. A description of the method of assuring funds for decommissioning from 39.4(26) “f,” including means for adjusting cost estimates and associated funding levels periodically over the life of the facility;
4. A certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning; and
5. A signed original of the financial instrument obtained to satisfy the requirements of 39.4(26) “f” (unless a previously submitted and accepted financial instrument continues to cover the cost estimate for decommissioning).

(2) At the time of license renewal and at intervals not to exceed three years, the decommissioning funding plan must be resubmitted with adjustments as necessary to account for changes in costs and the extent of contamination. If the amount of financial assurance will be adjusted downward, this cannot be

done until the updated decommissioning funding plan is approved. The decommissioning funding plan must update the information submitted with the original or prior approved plan, and must specifically consider the effect of the following events on decommissioning costs:

1. Spills of radioactive material producing additional residual radioactivity in onsite subsurface material;
2. Waste inventory increasing above the amount previously estimated;
3. Waste disposal costs increasing above the amount previously estimated;
4. Facility modifications;
5. Changes in authorized possession limits;
6. Actual remediation costs that exceed the previous cost estimate;
7. Onsite disposal; and
8. Use of a settling pond.

f. The financial instrument must include the licensee's name, license number, and the name, address, and other contact information of the issuer, and, if a trust is used, the trustee. When any of the foregoing information changes, the licensee must, within 30 days, submit financial instruments reflecting such changes. The financial instrument submitted must be a signed original or signed original duplicate, except where a copy of the signed original is specifically permitted. Financial assurance for decommissioning must be provided by one or more of the following methods:

(1) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets such that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities.

(2) A surety method, insurance, or other guarantee method. These methods guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in Appendix F of this chapter. A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of this subrule. For commercial corporations that issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in Appendix H of this chapter. For commercial companies that do not issue bonds, a guarantee of funds by the applicant or licensee for decommissioning costs may be used if the guarantee and test are as contained in Appendix I of this chapter. For nonprofit entities, such as colleges, universities, and nonprofit hospitals, a guarantee of funds by the applicant or licensee may be used if the guarantee and test are as contained in Appendix J of this chapter. A guarantee by the applicant or licensee may not be used in combination with any other financial methods used to satisfy the requirements of paragraph 39.4(26) "f" or in any situation where the applicant or licensee has a parent company holding majority control of the voting stock of the company. Any surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

1. The surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date, the issuer notifies the agency, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the agency within 30 days after receipt of notification of cancellation.

2. The surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the agency. An acceptable trustee includes an appropriate state or federal government agency or an entity which has authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.

3. The surety method or insurance must remain in effect until the agency has terminated the license.

(3) An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provisions must be as stated in 39.4(26) "f"(2).

(4) In the case of federal, state, or local government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on the table in 39.4(26) "d," and indicating that funds for decommissioning will be obtained when necessary.

(5) When a governmental entity assumes custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity.

g. Each person licensed under this chapter shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is released for unrestricted use. Before licensed activities are transferred or assigned to another licensee, the licensee shall transfer all records described in this subrule to the new licensee. In this case, the new licensee will be responsible for maintaining these records until the license is terminated. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the agency considers important to decommissioning consists of:

(1) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations.

(2) As-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used, stored, or both, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations.

(3) Records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

(4) Except for areas containing only sealed sources (provided the sources have not leaked or no contamination remains after any leak) or byproduct materials having only half-lives of less than 65 days, a list contained in a single document and updated every two years, of the following:

1. All areas designated as restricted areas as defined under 641—38.2(136C);
2. All areas outside of restricted areas that require documentation under 641—39.4(26) "g"(1);
3. All areas outside of restricted areas where current and previous wastes have been buried as documented under 641—40.88(136C); and
4. All areas outside of restricted areas which contain material such that, if the license expired, the licensee would be required to either decontaminate the area to unrestricted release levels or apply for approval for disposal in accordance with 641—40.71(136C).

39.4(27) *Special requirements for issuance of certain specific licenses for radioactive material.*

a. to d. Reserved.

e. Use of sealed sources in industrial radiography. In addition to the requirements set forth in 39.4(25), a specific license for use of sealed sources in industrial radiography will be issued if the application contains:

- (1) A schedule or description of the program for training radiographic personnel which specifies:
 1. Initial training,
 2. Periodic training,

3. On-the-job training, and
4. Methods to be used by the licensee to determine the knowledge, understanding, and ability of radiographic personnel to comply with agency rules, licensing requirements, and the operating and emergency procedures of the applicant;
 - (2) Written operating and emergency procedures, including all items listed in Appendix D of 641—Chapter 45;
 - (3) A description of the internal inspection system or other management control to ensure that radiographic personnel follow license provisions, rules of the agency, and the applicant's operating and emergency procedures;
 - (4) A list of permanent radiographic installations and descriptions of permanent storage and use locations. Radioactive material shall not be stored at a permanent storage location or used at a permanent use location unless such storage or use location is specifically authorized by the license. A storage or use location is permanent if radioactive material is stored at the location for more than 90 days and any of the following applies to the location:
 1. Non-wireless telephone service is established by the licensee;
 2. Industrial radiographic services are advertised for or from the location;
 3. Industrial radiographic operations are conducted at other sites due to arrangements made from the location;
 - (5) A description of the organization of the industrial radiographic program, including delegations of authority and responsibility for operation of the radiation safety program;
 - (6) A description of the program for inspection and maintenance of radiographic exposure devices and transport and storage containers (including applicable items in 641—subrule 45.1(8) and 641—Chapter 45, Appendix A); and
 - (7) If a license application includes underwater radiography, a description of:
 1. Radiation safety procedures and radiographer responsibilities unique to the performance of underwater radiography;
 2. Radiographic equipment and radiation safety equipment unique to underwater radiography; and
 3. Methods for gas-tight encapsulation of equipment;
 - (8) If a license application includes offshore platform or lay-barge radiography, a description of:
 1. Transport procedures for radioactive material to be used in industrial radiographic operations;
 2. Storage facilities for radioactive material; and
 3. Methods for restricting access to radiation areas.

39.4(28) *Special requirements for specific licenses of broad scope.* This subrule prescribes requirements for the issuance of specific licenses of broad scope for radioactive material and certain rules governing holders of such licenses. Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing by-product material whose subsequent possession, use, transfer, and disposal by all other persons are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

a. The different types of broad scope licenses are set forth below:

(1) A "Type A specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of the radioactive material specified in the license, but not exceeding quantities specified in the license, for any authorized purpose. The quantities specified are usually in the multicurie range.

(2) A "Type B specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in Appendix D of this chapter, for any authorized purpose. The possession limit for a Type B license of broad scope, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in Appendix D, Column I. If two or more radionuclides are possessed thereunder, the possession limit for each is determined as follows: for each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in Appendix D, Column I, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

(3) A “Type C specific license of broad scope” is a specific license authorizing receipt, acquisition, ownership, possession, use, and transfer of any chemical or physical form of radioactive material specified in Appendix D of this chapter, for any authorized purpose. The possession limit for a Type C license of broad scope, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in Appendix D, Column II. If two or more radionuclides are possessed thereunder, the possession limit is determined for each as follows: for each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in Appendix D, Column II, for that radionuclide. The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

b. An application for a Type A specific license of broad scope will be approved if:

(1) The applicant satisfies the general requirements specified in 39.4(25);

(2) The applicant has engaged in a reasonable number of activities involving the use of radioactive material; and

(3) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting, and management review that are necessary to ensure safe operations, including:

1. The establishment of a radiation safety committee composed of such persons as a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;

2. The appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters; and

3. The establishment of appropriate administrative procedures to ensure:

- Control of procurement and use of radioactive material;

- Completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and

- Review, approval, and recording by the radiation safety committee of safety evaluations of proposed uses prepared in accordance with 39.4(28) “*b*”(3)“3” prior to use of the radioactive material.

c. An application for a Type B specific license of broad scope will be approved if:

(1) The applicant satisfies the general requirements specified in 39.4(25); and

(2) The applicant has established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting, and management review that are necessary to ensure safe operations, including:

1. The appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters, and

2. The establishment of appropriate administrative procedures to ensure:

- Control of procurement and use of radioactive material;

- Completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and

- Review, approval, and recording by the radiation safety officer of safety evaluations of proposed uses prepared in accordance with 39.4(28) “*c*”(2)“2” prior to use of the radioactive material.

d. An application for a Type C specific license of broad scope will be approved if:

(1) The applicant satisfies the general requirements specified in 39.4(25).

(2) The applicant submits a statement that radioactive material will be used only by, or under the direct supervision of, individuals who have received:

1. A college degree at the bachelor level, or equivalent training and experience, in the physical or biological sciences or in engineering; and

2. At least 40 hours of training and experience in the safe handling of radioactive material, and in the characteristics of ionizing radiation, units of radiation dose and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation appropriate to the type and forms of radioactive material to be used.

(3) The applicant has established administrative controls and provisions relating to procurement of radioactive material, procedures, record keeping, material control and accounting, and management review necessary to ensure safe operations.

e. Specific licenses of broad scope are subject to the following conditions:

(1) Unless specifically authorized, persons licensed pursuant to 39.4(28) shall not:

1. Conduct tracer studies in the environment involving direct release of radioactive material;

2. Receive, acquire, own, possess, use, or transfer devices containing 100,000 curies (3.7 PBq) or more of radioactive material in sealed sources used for irradiation of materials;

3. Conduct activities for which a specific license issued by the agency under 39.4(27), 39.4(29) or 641—41.2(136C) is required; or

4. Add or cause the addition of radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.

(2) Each Type A specific license of broad scope issued under this chapter shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee’s radiation safety committee.

(3) Each Type B specific license of broad scope issued under this chapter shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee’s radiation safety officer.

(4) Each Type C specific license of broad scope issued under this chapter shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals who satisfy the requirements of 39.4(28)“d.”

39.4(29) *Special requirements for a specific license to manufacture, assemble, repair, or distribute commodities, products, or devices which contain radioactive material.*

a. Rescinded IAB 7/29/09, effective 9/2/09.

b. Rescinded IAB 3/30/05, effective 5/4/05.

c. Rescinded IAB 7/29/09, effective 9/2/09.

d. Licensing the manufacture and distribution of devices to persons generally licensed under 39.4(22)“d.”

(1) An application for a specific license to manufacture or initially transfer devices containing radioactive material, excluding special nuclear material, to persons generally licensed under 39.4(22)“d” or equivalent regulations of the NRC, an agreement state, or a licensing state will be approved if:

1. The applicant satisfies the general requirements of 39.4(25);

2. The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, servicing, leak testing, operating and safety instructions, and potential hazards of the device to provide reasonable assurance that:

• The device can be safely operated by persons not having training in radiological protection,

• Under ordinary conditions of handling, storage, and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in any period of one year a dose in excess of 10 percent of the annual limits specified in 641—40.15(136C); and

• Under accident conditions such as fire and explosion associated with handling, storage, and use of the device, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the following organ doses:

Whole body; head and trunk; active blood-forming organs; gonads; or lens
of eye 15 rems (150 mSv)

Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than 1 square centimeter 200 rems (2 Sv)

Other organs. 50 rems (500 mSv)

3. Each device bears a durable, legible, clearly visible label or labels approved by the agency, NRC, or agreement state or licensing state, which contains in a clearly identified and separate statement:

- Instructions and precautions necessary to ensure safe installation, operation, and servicing of the device. Documents such as operating and service manuals may be identified in the label and used to provide this information;
- The requirement, or lack of requirement, for leak testing, or for testing any “on-off” mechanism and indicator, including the maximum time interval for such testing, and the identification of radioactive material by isotope, quantity of radioactivity, and date of determination of the quantity; and
- The information called for in one of the following statements, as appropriate, in the same or substantially similar form:

The receipt, possession, use, and transfer of this device, Model _____, Serial No. _____, (devices licensed prior to January 19, 1975, may bear labels authorized by the rules in effect on January 1, 1975)(the model, serial number, and name of the manufacturer or initial transferor may be omitted from this label provided the information is elsewhere specified in labeling affixed to the device) are subject to a general license or the equivalent and the chapter of the U.S. Nuclear Regulatory Commission or a state with which the U.S. Nuclear Regulatory Commission has entered into an agreement for the exercise of regulatory authority. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.

CAUTION—RADIOACTIVE MATERIAL

 Name of manufacturer or initial transferor

4. Each device having a separable source housing that provides the primary shielding for the source also bears, on the source housing, a durable label containing the device model number and serial number, the isotope and quantity, the words “Caution—Radioactive Material,” the radiation symbol described in 641—subrule 40.60(1), and the name of the manufacturer or initial distributor;

5. Each device meeting the criteria of 39.4(22) “d”(3)“13” bears a permanent (e.g., embossed, etched, stamped, or engraved) label affixed to the source housing if separable, or the device if the source housing is not separable, that includes the words, “Caution—Radioactive Material,” and, if practicable, the radiation symbol described in 641—subrule 40.60(1); and

6. The device has been registered in the Sealed Source and Device Registry.

(2) In the event the applicant desires that the device be required to be tested at intervals longer than six months, either for proper operation of the “on-off” mechanism and indicator, if any, or for leakage of radioactive material or for both, the applicant shall include in the application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the device or similar devices and by design features which have a significant bearing on the probability or consequences of leakage of radioactive material from the device or failure of the “on-off” mechanism and indicator. In determining the acceptable interval for the test for leakage of radioactive material, the agency will consider information which includes, but is not limited to:

1. Primary containment or source capsule;
2. Protection of primary containment;
3. Method of sealing containment;
4. Containment construction materials;
5. Form of contained radioactive material;
6. Maximum temperature withstood during prototype tests;
7. Maximum pressure withstood during prototype tests;
8. Maximum quantity of contained radioactive material;

9. Radiotoxicity of contained radioactive material; and
10. Operating experience with identical devices or similarly designed and constructed devices.

(3) In the event the applicant desires that the general licensee under 39.4(22)“d,” or under equivalent regulations of the NRC, an agreement state, or a licensing state be authorized to install the device, collect the sample to be analyzed by a specific licensee for leakage of radioactive material, service the device, test the “on-off” mechanism and indicator, or remove the device from installation, the applicant shall include in the application written instructions to be followed by the general licensee, estimated calendar quarter doses associated with such activity or activities, and bases for such estimates. The submitted information shall demonstrate that performance of such activity or activities by an individual untrained in radiological protection, in addition to other handling, storage, and use of devices under the general license, is unlikely to cause that individual to receive a dose in excess of 10 percent of the annual limits specified in 641—40.15(136C).

(4) Information to be provided before transfer.

1. If a device containing radioactive material is to be transferred for use under the general license contained in 39.4(22)“d,” each person that is licensed under 39.4(22)“d” shall provide the information specified to each person to whom a device is to be transferred. This information must be provided before the device may be transferred. In the case of a transfer through an intermediate person, the information must also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes:

- A copy of the general license contained in 39.4(22), or if 39.4(22)“d”(3)“2,” “3,” or “4” or 39.4(22)“d”(3)“13” does not apply to the particular device, those paragraphs may be omitted;
- A copy of 39.4(20), 39.4(52), 641—40.95(136C), and 641—40.96(136C);
- A list of the services that can only be performed by a specific licensee;
- Information on acceptable disposal options including estimated costs of disposal; and
- An indication that it is the policy of the NRC and this agency to issue high civil penalties for improper disposal.

2. If radioactive material is to be transferred in a device for use under an equivalent general license of the NRC or an agreement state, each person that is licensed under 39.4(29)“d” shall provide the information specified in this paragraph to each person to whom a device is to be transferred. In the case of a transfer through an intermediate person, the information must also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes:

- A copy of the NRC or agreement state’s rules equivalent to 39.4(29)“d.” If a copy of the NRC regulations is provided to a prospective general licensee in lieu of the agreement state’s regulations, it shall be accompanied by a note explaining that use of the device is regulated by the agreement state; if certain paragraphs of the regulations do not apply to the particular device, those paragraphs may be omitted;

- A list of the services that can only be performed by a specific licensee;
- Information on acceptable disposal options including estimated costs of disposal; and
- The name or title, address, and telephone number of the contact at the agreement state regulatory agency from which additional information may be obtained.

3. An alternative approach to informing customers may be proposed by the licensee for approval by the agency.

4. Each device that is transferred after February 19, 2002, must meet the labeling requirements in 39.4(29)“d.”

5. If a notification of bankruptcy has been made or the license is to be terminated, each person licensed under 39.4(29)“d” shall provide, upon request, to the NRC and to any appropriate agreement state, records of final disposition.

(5) Transfer reports and records. Each person licensed under 39.4(29)“d” to initially transfer devices to generally licensed persons shall comply with the requirements of this subparagraph.

1. The person shall report all transfers of devices to persons for use under the general license in 39.4(29)“d” and all receipts of devices from persons licensed under 39.4(29)“d” to the NRC, this agency, or another agreement state. The report must be submitted on a quarterly basis in a clear and

legible report containing all of the data required in this subrule. The required information for transfers to general licensees includes:

- The identity of each general licensee by name and mailing address for the location of use; if there is no mailing address for the location of use, an alternate address for the general licensee shall be submitted along with information on the actual location of use;

- The name, title, and telephone number of the person identified by the general licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate rules and requirements;

- The date of transfer;
- The type, model number, and serial number of the device transferred; and
- The quantity and type of radioactive material contained in the device.

2. If one or more intermediate persons will temporarily possess the device at the intended place of use before its possession by the user, the report must include the same information for both the intended user and each intermediate person, and clearly designate the intermediate person(s).

3. For devices received from a general licensee, the report must include the identity of the general licensee by name and address; the type, model number, and serial number of the device received; the date of receipt; and, in the case of devices not initially transferred by the reporting licensee, the name of the manufacturer or initial transferor.

4. If the licensee makes changes to a device possessed by a general licensee, such that the label must be changed to update the required information, the report must identify the general licensee, the device, and the changes to information on the device label.

5. The report must cover each calendar quarter, must be filed within 30 days of the end of the calendar quarter, and must clearly indicate the period covered by the report.

6. The report must clearly identify the specific licensee submitting the report and include the license number of the specific licensee.

7. If no transfers have been made to or from persons generally licensed under 39.4(29) "d" during the reporting period, the report must so indicate.

(6) The person shall maintain all information concerning transfers and receipts of devices that supports the reports required by 39.4(29) "d." Records required in 39.4(29) "d" must be maintained for three years following the date of the recorded event.

e. Special requirements for the manufacture, assembly, or repair of luminous safety devices for use in aircraft. An application for a specific license to manufacture, assemble, or repair luminous safety devices containing tritium or promethium-147 for use in aircraft, for distribution to persons generally licensed under 39.4(22) "e," will be approved if:

- (1) The applicant satisfies the general requirements specified in 39.4(25); and
- (2) The applicant satisfies the requirements of Sections 32.53, 32.54, 32.55, and 32.56 of 10 CFR Part 32, or their equivalent.

f. An application for a specific license to manufacture or initially transfer calibration or reference sources containing americium-241 or radium-226 for distribution to persons generally licensed under 39.4(22) "g" will be approved if:

- (1) The applicant satisfies the general requirements of 39.4(25); and
- (2) The applicant satisfies the requirements of Sections 32.57, 32.58, and 32.59 of 10 CFR Part 32, or their equivalent.

g. Reserved.

h. Manufacture and distribution of radioactive material for certain in vitro clinical or laboratory testing under general license. An application for a specific license to manufacture or distribute radioactive material for use under the general license of 39.4(22) "i" will be approved if:

- (1) The applicant satisfies the general requirements specified in 39.4(25).
- (2) The radioactive material is to be prepared for distribution in prepackaged units of:
 1. Carbon-14 in units not exceeding 10 microcuries (370 kBq) each.
 2. Hydrogen-3 (tritium) in units not exceeding 50 microcuries (1.85 MBq) each.
 3. Iodine-125 in units not exceeding 10 microcuries (370 kBq) each.

4. Mock iodine-125 in units not exceeding 0.05 microcurie (1.85 kBq) of iodine-129 and 0.005 microcurie (185 Bq) of americium-241 each.

5. Iodine-131 in units not exceeding 10 microcuries (370 kBq) each.

6. Iron-59 in units not exceeding 20 microcuries (740 kBq) each.

7. Selenium-75 in units not exceeding 10 microcuries (370 kBq) each.

8. Cobalt-57 in units not exceeding 10 microcuries (370 kBq) each.

(3) Each prepackaged unit bears a durable, clearly visible label:

1. Identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed 10 microcuries (370 kBq) of iodine-125, iodine-131, carbon-14, cobalt-57, or selenium-75; 50 microcuries (1.85 MBq) of hydrogen-3 (tritium); 20 microcuries (740 kBq) of iron-59; or mock iodine-125 in units not exceeding 0.05 microcurie (1.85 kBq) of iodine-129 and 0.005 microcurie (185 Bq) of americium-241 each; and

2. Displaying the radiation caution symbol described in 641—subrule 40.60(1) and the words, “CAUTION—RADIOACTIVE MATERIAL,” and “Not for Internal or External Use in Humans or Animals.”

(4) One of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package:

1. This radioactive material may be received, acquired, possessed, and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use, and transfer are subject to the regulations and a general license of the U.S. Nuclear Regulatory Commission or an agreement state.

Name of manufacturer

2. Rescinded IAB 3/30/05, effective 5/4/05.

(5) The label affixed to the unit, or the leaflet or brochure which accompanies the package, contains adequate information as to the precautions to be observed in handling and storing such radioactive material. In the case of the mock iodine-125 reference or calibration source, the information accompanying the source must also contain directions to the licensee regarding the waste disposal requirements set out in 641—subrule 40.70(1).

i. An application for a specific license to manufacture or initially transfer ice detection devices containing strontium-90 to persons generally licensed under 39.4(22) “j” will be approved if the applicant satisfies the general requirements of 39.4(25) and the requirements of Sections 32.61 and 32.62 of 10 CFR Part 32, or their equivalent.

j. Manufacture, preparation, or transfer for commercial distribution of radioactive drugs containing by-product material for medical use under 641—41.2(136C).

(1) An application for a specific license to manufacture, prepare, or transfer for commercial distribution radioactive drugs containing by-product material for use by persons authorized pursuant to 641—41.2(136C) will be approved if:

1. The applicant satisfies the general requirements specified in subrule 39.4(25);

2. The applicant submits evidence that the applicant is at least one of the following:

- Registered with the U.S. Food and Drug Administration (FDA) as the owner or operator of a drug establishment that engages in the manufacture, preparation, propagation, compounding, or processing of a drug under 21 CFR 207.20(a);

- Registered or licensed with a state agency as a drug manufacturer;

- Licensed by the Iowa board of pharmacy as a nuclear pharmacy;

- Operating as a nuclear pharmacy within a federal medical institution; or

- A positron emission tomography (PET) drug production facility registered or licensed with a state agency;

3. The applicant submits information on the radionuclide: the chemical and physical form; the maximum activity per vial, syringe, generator, or other container of the radioactive drug; the shielding provided by the packaging to show it is appropriate for the safe handling and storage of the radioactive drugs by medical use licensees; and

4. The applicant satisfies the following labeling requirements:

- A label is affixed to each transport radiation shield, whether it is constructed of lead, glass, plastic, or other material, of a radioactive drug to be transferred for commercial distribution. The label must include the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL” or “DANGER, RADIOACTIVE MATERIAL”; the name of the radioactive drug or its abbreviation; and the quantity of radioactivity at a specified date and time. For radioactive drugs with a half-life greater than 100 days, the time may be omitted.

- A label is affixed to each syringe, vial, or other container used to hold a radioactive drug to be transferred for commercial distribution. The label must include the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL” or “DANGER, RADIOACTIVE MATERIAL” and an identifier that ensures that the syringe, vial, or other container can be correlated with the information on the transport radiation shield label.

(2) A licensee as described by 39.4(29)“j”(1)“2”:

1. May prepare radioactive drugs for medical use, as defined in 641—38.2(136C), provided that the radioactive drug is prepared by either an authorized nuclear pharmacist, as specified in 39.4(29)“j”(2)“2” and 39.4(29)“j”(2)“3” or an individual under the supervision of an authorized nuclear pharmacist as specified in 641—paragraph 41.2(11)“c.”

2. May allow a pharmacist to work as an authorized nuclear pharmacist if:

- This individual qualifies as an authorized nuclear pharmacist as defined in 641—subrule 41.2(2),

- This individual meets the requirements specified in 641—subrules 41.2(77) and 41.2(78) and the licensee has received an approved license amendment identifying this individual as an authorized nuclear pharmacist, or

- This individual is designated as an authorized nuclear pharmacist in accordance with 39.4(29)“j”(2)“3.”

3. May designate a pharmacist (as defined in 641—subrule 41.2(2)) as an authorized nuclear pharmacist if the individual was a nuclear pharmacist preparing only radioactive drugs containing accelerator-produced radioactive material and the individual practiced at a pharmacy at a government agency or federally recognized Indian tribe before November 30, 2007, or at all other pharmacies before August 8, 2009, or an earlier date as noticed by the NRC.

4. Shall permit the actions authorized in 39.4(29)“j”(2)“1” and “2” that are permitted in spite of more restrictive language in license conditions.

5. Shall provide to the agency a copy of each individual’s:

- Certification by a specialty board whose certification process has been recognized by the NRC or an agreement state as specified in 641—paragraph 41.2(78)“a” with the written attestation signed by a preceptor as required by 641—paragraph 41.2(78)“c”; or

- NRC or agreement state license; or

- NRC master materials licensee permit; or

- Permit issued by a licensee or NRC master materials permittee of broad scope or authorization from a commercial nuclear pharmacy authorized to list its own authorized nuclear pharmacist; or

- Documentation that only accelerator-produced radioactive materials were used in the practice of nuclear pharmacy at a government agency or federally recognized Indian tribe before November 30, 2007, or at all other locations of use before August 8, 2009, or an earlier date as noticed by the NRC; and

- State pharmacy licensure or registration, no later than 30 days after the date that the licensee allows, pursuant to 39.4(29)“j”(2)“2,” first and third bulleted paragraphs, the individual to work as an authorized nuclear pharmacist.

(3) A licensee shall possess and use instrumentation to measure the radioactivity of radioactive drugs. The licensee shall have procedures for use of the instrumentation. The licensee shall measure, by

direct measurement or by combination of measurements and calculations, the amount of radioactivity in dosages of alpha-, beta-, or photon-emitting radioactive drugs prior to transfer for commercial distribution. In addition, the licensee shall:

1. Perform tests before initial use, periodically, and following repair, on each instrument for accuracy, linearity, and geometry dependence, as appropriate for the use of the instrument, and make adjustments when necessary; and

2. Check each instrument for constancy and proper operation at the beginning of each day of use.

- (4) Nothing in this subrule relieves the licensee from complying with applicable FDA, other federal, and state requirements governing radioactive drugs.

k. Manufacture and distribution of generators or reagent kits for preparation of radiopharmaceuticals containing radioactive material. Although the agency does not regulate the manufacture and distribution of reagent kits that do not contain radioactive material, it does regulate the use of such reagent kits for the preparation of radiopharmaceuticals containing radioactive material as part of its licensing and regulation of the users of radioactive material. Any manufacturer of reagent kits that do not contain radioactive material who desires to have their reagent kits approved by the agency for use by persons licensed pursuant to 641—subrule 41.2(33) may submit the pertinent information specified in 39.4(29)“*k.*” An application for a specific license to manufacture and distribute generators or reagent kits containing radioactive material for preparation of radiopharmaceuticals by persons licensed pursuant to this chapter for the uses listed in 641—subrule 41.2(33) will be approved if:

- (1) The applicant satisfies the general requirements specified in 39.4(25);

- (2) The applicant submits evidence that:

1. The generator or reagent kit is to be manufactured, labeled and packaged in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, such as a new drug application (NDA) approved by the Food and Drug Administration (FDA), or a “Notice of Claimed Investigational Exemption for a New Drug” (IND) that has been accepted by the FDA, or

2. The manufacture and distribution of the generator or reagent kit are not subject to the Federal Food, Drug and Cosmetic Act and the Public Health Service Act;

- (3) The applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material contained in the generator or reagent kit;

- (4) The label affixed to the generator or reagent kit contains information on the radionuclide, quantity, and date of assay; and

- (5) The label affixed to the generator or reagent kit, or the leaflet or brochure which accompanies the generator or reagent kit, contains:

1. Adequate information, from a radiation safety standpoint, on the procedures to be followed and the equipment and shielding to be used in eluting the generator or processing radioactive material with the reagent kit, and

2. A statement that this generator or reagent kit, as appropriate, is approved for use by persons licensed by the agency pursuant to 641—subrule 41.2(33) or under equivalent licenses of the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state. The labels, leaflets, or brochures required by 39.4(29)“*k.*” are in addition to the labeling required by the Food and Drug Administration (FDA) and they may be separate from or, with the approval of the FDA, may be combined with the labeling required by the FDA.

l. Manufacture and distribution of sources or devices containing radioactive material for medical use.

- (1) An application for a specific license to manufacture and distribute sources and devices containing radioactive material to persons licensed pursuant to 641—41.2(136C) for use as a calibration, transmission, or reference source or for the uses listed in 641—subrules 41.2(41), 41.2(43), 41.2(49), and 41.2(88) will be approved if:

1. The applicant satisfies the general requirements in 39.4(25);

2. The applicant submits sufficient information regarding each type of source or device pertinent to an evaluation of its radiation safety, including:

- The radioactive material contained, its chemical and physical form, and amount,
- Details of design and construction of the source or device,
- Procedures for, and results of, prototype tests to demonstrate that the source or device will maintain its integrity under stresses likely to be encountered in normal use and accidents,
- For devices containing radioactive material, the radiation profile of a prototype device,
- Details of quality control procedures to ensure that production sources and devices meet the standards of the design and prototype tests,
- Procedures and standards for calibrating sources and devices,
- Legend and methods for labeling sources and devices as to their radioactive content, and
- Instructions for handling and storing the source or device from the radiation safety standpoint.

These instructions are to be included on a durable label attached to the source or device or attached to a permanent storage container for the source or device, provided that instructions which are too lengthy for such label may be summarized on the label and printed in detail on a brochure which is referenced on the label;

3. The label affixed to the source or device, or to the permanent storage container for the source or device, contains information on the radionuclide, quantity, and date of assay, and a statement that the NRC, agreement state, or this agency has approved distribution of the source or device to persons licensed to use by-product material identified in 641—41.2(136C) and 641—subrules 41.2(41) and 41.2(43), as appropriate, and to persons who hold an equivalent license issued by the NRC or an agreement state; and

4. The source or device has been registered in the Sealed Source and Device Registry.

(2) In the event the applicant desires that the source or device be required to be tested for leakage of radioactive material at intervals longer than six months, the applicant shall include in the application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the source or device or similar sources or devices and by design features that have a significant bearing on the probability or consequences of leakage of radioactive material from the source.

(3) In determining the acceptable interval for test of leakage of radioactive material, the agency will consider information that includes, but is not limited to:

1. Primary containment or source capsule,
2. Protection of primary containment,
3. Method of sealing containment,
4. Containment construction materials,
5. Form of contained radioactive material,
6. Maximum temperature withstood during prototype tests,
7. Maximum pressure withstood during prototype tests,
8. Maximum quantity of contained radioactive material,
9. Radiotoxicity of contained radioactive material, and
10. Operating experience with identical sources or devices or similarly designed and constructed sources or devices.

m. Requirements for license to manufacture and distribute industrial products containing depleted uranium for mass-volume applications.

(1) An application for a specific license to manufacture industrial products and devices containing depleted uranium for use pursuant to 39.4(21)“d” or equivalent regulations of the U.S. Nuclear Regulatory Commission or an agreement state will be approved if:

1. The applicant satisfies the general requirements specified in 39.4(25);
2. The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, proposed uses, and potential hazards of the industrial product or device to provide reasonable assurance that possession, use, or transfer of the depleted uranium in the product or device is not likely to cause any individual to receive in any period of one calendar quarter a radiation dose in excess of 10 percent of the limits specified in 641—40.15(136C) of these rules; and

3. The applicant submits sufficient information regarding the industrial product or device and the presence of depleted uranium for a mass-volume application in the product or device to provide

reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or device.

(2) In the case of an industrial product or device whose unique benefits are questionable, the agency will approve an application for a specific license under 39.4(29)“m” only if the product or device is found to combine a high degree of utility and low probability of uncontrolled disposal and dispersal of significant quantities of depleted uranium into the environment.

(3) The agency may deny any application for a specific license under 39.4(29)“m” if the end use(s) of the industrial product or device cannot be reasonably foreseen.

(4) Each person licensed pursuant to 39.4(29)“m”(1) shall:

1. Maintain the level of quality control required by the license in the manufacture of the industrial product or device, and in the installation of the depleted uranium into the product or device;

2. Label or mark each unit to:

- Identify the manufacturer of the product or device and the number of the license under which the product or device was manufactured, the fact that the product or device contains depleted uranium, and the quantity of depleted uranium in each product or device; and

- State that the receipt, possession, use, and transfer of the product or device are subject to a general license or the equivalent and the regulations of the U.S. Nuclear Regulatory Commission or an agreement state;

3. Ensure that the depleted uranium before being installed in each product or device has been impressed with the following legend clearly legible through any plating or other covering: “Depleted Uranium”

4. Furnish a copy of the general license contained in 39.4(21)“d” and a copy of the agency form used to register the device to each person to whom the person transfers depleted uranium in a product or device for use pursuant to the general license contained in 39.4(21)“d,” or furnish a copy of the general license contained in the U.S. Nuclear Regulatory Commission’s or agreement state’s regulation equivalent to 39.4(21)“d” and a copy of the U.S. Nuclear Regulatory Commission’s or agreement state’s certificate, or alternatively, furnish a copy of the general license contained in 39.4(21)“d” and a copy of the agency form used to register to each person to whom the person transfers depleted uranium in a product or device for use pursuant to the general license of the U.S. Nuclear Regulatory Commission or an agreement state, with a note explaining that use of the product or device is regulated by the U.S. Nuclear Regulatory Commission or an agreement state under requirements substantially the same as those in 39.4(21)“d”;

5. Report to the agency all transfers of industrial products or devices to persons for use under the general license in 39.4(21)“d.” Such report shall identify each general licensee by name and address, an individual by name and position who may constitute a point of contact between the agency and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such a product or device is transferred to the generally licensed person. If no transfers have been made to persons generally licensed under 39.4(21)“d” during the reporting period, the report shall so indicate;

6. Report to the U.S. Nuclear Regulatory Commission all transfers of industrial products or devices to persons for use under the U.S. Nuclear Regulatory Commission general license in Section 40.25 of 10 CFR Part 40; and shall report to the responsible state agency all transfers of devices manufactured and distributed pursuant to 39.4(29)“m” for use under a general license in that state’s regulations equivalent to 39.4(21)“d.” Such report shall identify each general licensee by name and address, an individual by name and position who may constitute a point of contact between the agency and the general licensee, the type and model number of the device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such product or device is transferred to the generally licensed person. If no transfers have been made to U.S. Nuclear Regulatory Commission licensees during the reporting period, this information shall be reported to the U.S. Nuclear Regulatory Commission. If no transfers have been made to general licensees within a particular agreement state during the reporting

period, this information shall be reported to the responsible agreement state agency upon the request of that agency; and

7. Keep records showing the name, address, and point of contact for each general licensee to whom the person transfers depleted uranium in industrial products or devices for use pursuant to the general license provided in 39.4(21)“d” or equivalent regulations of the U.S. Nuclear Regulatory Commission or an agreement state. The records shall be maintained for a period of two years and shall show the date of each transfer, the quantity of depleted uranium in each product or device transferred, and compliance with the report requirements of 641—Chapters 39 and 40.

n. Rescinded IAB 7/29/09, effective 9/2/09.

o. Acceptance sampling procedures under certain specific licenses. A random sample shall be taken from each inspection lot of devices licensed under 39.4(29) for which testing is required and meet the requirements pursuant to 10 CFR 32.110.

39.4(30) Reserved.

39.4(31) *Issuance of specific licenses.*

a. Upon a determination that an application meets the requirements of the Iowa Code and the rules of the agency, the agency will issue a specific license authorizing the proposed activity in such form and containing such conditions and limitations as it deems appropriate or necessary.

b. The agency may incorporate in any license at the time of issuance, or thereafter by appropriate rule, regulation, or order, such additional requirements and conditions with respect to the licensee’s receipt, possession, use, and transfer of radioactive material subject to this chapter as it deems appropriate or necessary in order to:

- (1) Minimize danger to public health and safety or property;
- (2) Require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be appropriate or necessary; and
- (3) Prevent loss or theft of material subject to this chapter.

c. Specific license for industrial radiography. An application for a specific license for the use of licensed material in industrial radiography will be approved if the applicant meets the following requirements:

- (1) The applicant satisfies the general requirements specified in 39.4(25).
- (2) The applicant submits an adequate program for training radiographers and radiographers’ assistants that meets the requirements of 641—subrule 45.1(10).
- (3) The applicant submits procedures for verifying and documenting the certification status of radiographers and for ensuring that the certification of individuals acting as radiographers remains valid.
- (4) The applicant submits written operating and emergency procedures as described in 641—subrule 45.2(4).

(5) The applicant submits a description of a program for inspections of the job performance of each radiographer and radiographer’s assistant at intervals not to exceed six months as described in 641—subrule 45.1(11).

(6) The applicant submits a description of the applicant’s overall organizational structure as it applies to the radiation responsibilities in industrial radiography, including specified delegation of authority and responsibility.

(7) The applicant identifies and lists the qualifications of the individual(s) designated as the RSO (641—paragraph 45.1(10)“d”) and potential designees responsible for ensuring that the licensee’s radiation safety program is implemented in accordance with approved procedures.

(8) If an applicant intends to perform leak testing of sealed sources or exposure devices containing depleted uranium (DU) shielding, the applicant must describe the procedures for performing and the qualifications of the person(s) authorized to do the leak testing. If the applicant intends to analyze its own wipe samples, the application must include a description of the procedures to be followed. The description must include the instruments to be used, methods of performing the analysis, and pertinent experience of the person who will analyze the wipe samples.

(9) If the applicant intends to perform “in-house” calibrations of survey instruments, the applicant must describe the methods to be used and the relevant experience of the person(s) who will perform

the calibrations. All calibrations must be performed according to the procedures described and at the intervals prescribed in 641—subrule 45.1(5).

(10) The applicant identifies and describes the location(s) of all field stations and permanent radiographic installations.

(11) The applicant identifies the locations where all records required by 641—Chapters 38, 39, 40, and 45 will be located.

d. Specific licenses for well logging. The agency will approve an application for a specific license for the use of licensed material in well logging if the applicant meets the following requirements:

(1) The applicant shall satisfy the general requirements specified in 39.4(25) and all other requirements in 641—Chapter 39, as appropriate, and any special requirements contained in 39.4(31)“*d.*”

(2) The applicant shall develop a program for training logging supervisors and logging assistants and submit to the agency a description of this program which specifies the following:

1. Initial training;

2. On-the-job training;

3. Annual safety reviews provided by the licensee;

4. The means the applicant will use to demonstrate the logging supervisor’s knowledge and understanding of and ability to comply with the agency’s regulations and licensing requirements and the applicant’s operating and emergency procedures; and

5. The means the applicant will use to demonstrate the logging assistant’s knowledge and understanding of and ability to comply with the applicant’s operating and emergency procedures.

(3) The applicant shall submit to the agency written operating and emergency procedures as described in 641—subrule 45.6(16) or an outline or summary of the procedures that includes the important radiation safety aspects of the procedures.

(4) The applicant shall establish and submit to the agency its program for annual inspections of the job performance of each logging supervisor to ensure that the agency’s regulations and license requirements and the applicant’s operating and emergency procedures are followed. Inspection records must be retained for three years after each annual internal inspection.

(5) The applicant shall submit a description of its overall organizational structure as the organizational structure applies to the radiation safety responsibilities in well logging, including specified delegations of authority and responsibility.

(6) If an applicant wants to perform leak testing of sealed sources, the applicant shall identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant wants to analyze its own wipe samples, the applicant shall establish procedures to be followed and submit a description of these procedures to the agency. The description must include the instruments to be used, methods of performing the analysis, and pertinent experience of the person who will analyze the wipe samples.

39.4(32) *Specific terms and conditions of licenses.*

a. Each license issued pursuant to this chapter shall be subject to all the provisions of the Iowa Code, now or hereafter in effect, and to all rules, regulations, and orders of the agency.

b. No license issued or granted under this chapter and no right to possess or utilize radioactive material granted by any license issued pursuant to this chapter shall be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person unless the agency shall, after securing full information, find that the transfer is in accordance with the provisions of the Iowa Code, now or hereafter in effect, and to all valid rules, regulations, and orders of the agency, and shall give its consent in writing. An application for transfer of license must include:

(1) The identity and technical and financial qualifications of the proposed transferee; and

(2) The financial assurance for decommissioning information required by 39.4(26).

c. Each person licensed by the agency pursuant to this chapter shall confine use and possession of the material licensed to the locations and purposes authorized in the license.

d. Each licensee shall notify the agency in writing when the licensee decides to permanently discontinue all activities involving materials authorized under the license.

e. Each licensee preparing technetium-99m radiopharmaceuticals from molybdenum-99/technetium-99m generators or rubidium-82 from strontium-82/rubidium-82 generators shall test the generator eluates for molybdenum-99 breakthrough or strontium-82 and strontium-85 contamination, respectively, in accordance with 641—subrule 41.2(34). The licensee shall record the results of each test and retain each record for three years after the record is made.

f. Each general licensee that is required to register by 39.4(21) or 39.4(22) and each specific licensee shall notify the agency in writing immediately following the filing of a voluntary or involuntary petition for bankruptcy under any Chapter of Title 11 (Bankruptcy) of the United States Code by or against:

- (1) The licensee;
- (2) An entity (as that term is defined in 11 U.S.C. 101(15)) controlling the licensee or listing the licensee or licensee as property of the estate; or
- (3) An affiliate (as that term is defined in 11 U.S.C. 101(2)) of the licensee.

The notification specified in 39.4(32) “*f*” shall indicate the bankruptcy court in which the petition for bankruptcy was filed and the date of the filing of the petition.

g. (1) Authorization under 39.4(29) “*h*” to produce positron emission tomography (PET) radioactive drugs for noncommercial transfer to medical use licensees in the licensee’s consortium does not relieve the licensee from complying with applicable FDA, other federal, and state requirements governing radioactive drugs.

(2) Each licensee authorized under 39.4(29) “*h*” to produce PET radioactive drugs for noncommercial transfer to medical use licensees in the licensee’s consortium shall:

1. Satisfy the labeling requirements in 39.4(29) “*j*”(1)“4” for each PET radioactive drug transport radiation shield and each syringe, vial, or other container used to hold a PET radioactive drug intended for noncommercial distribution to members of the licensee’s consortium.

2. Possess and use instrumentation to measure the radioactivity of the PET radioactive drugs intended for noncommercial distribution to members of the licensee’s consortium and meet the procedural, radioactivity measurement, instrument test, instrument check, and instrument adjustment requirements in 39.4(29) “*j*”(3).

(3) A licensee that is a pharmacy authorized under 39.4(24) “*h*” to produce PET radioactive drugs for noncommercial transfer to medical use licensees in the pharmacy’s consortium shall require that any individual who prepares PET radioactive drugs shall be:

1. An authorized nuclear pharmacist who meets the requirements in 39.4(29) “*j*”(2)“2,” or
2. An individual under the supervision of an authorized nuclear pharmacist as specified in 641—subrule 41.2(11).

(4) A pharmacy authorized under 39.4(29) “*j*” to produce PET radioactive drugs for noncommercial transfer to medical use licensees in the pharmacy’s consortium that allows an individual to work as an authorized nuclear pharmacist shall meet the requirements in 39.4(29) “*j*”(2)“5.”

39.4(33) *Expiration and termination of licenses and decommissioning of sites and separate buildings or outdoor areas.*

a. Each specific license expires at the end of the day on the expiration date stated in the license unless the licensee has filed an application for renewal under 39.4(33) not less than 30 days before the expiration date stated in the existing license. If an application for renewal has been filed at least 30 days before the expiration date stated in the existing license, the existing license expires at the end of the day on which the agency makes a final determination to deny the renewal application or, if the determination states an expiration date, the expiration date stated in the determination.

b. Each specific license revoked by the agency expires at the end of the day on the date of the agency’s final determination to revoke the license, or on the expiration date stated in the determination, or as otherwise provided by agency order.

c. Each specific license continues in effect, beyond the expiration date if necessary, with respect to possession of by-product material until the agency notifies the licensee in writing that the license is terminated. During this time, the licensee shall:

- (1) Limit actions involving by-product material to those related to decommissioning; and

(2) Continue to control entry to restricted areas until they are suitable for release in accordance with state of Iowa requirements.

d. Within 60 days of the occurrence of any of the following, each licensee shall provide notification to the agency in writing of such occurrence, and either begin decommissioning its site, or any separate building or outdoor area that contains residual radioactivity so that the building or outdoor area is suitable for release in accordance with the state of Iowa requirements, or submit within 12 months of notification a decommissioning plan, if required by 39.4(33)“j” and begin decommissioning upon approval of that plan if:

- (1) The license has expired pursuant to 39.4(33)“a” or “b”;
- (2) The licensee has decided to permanently cease principal activities, as defined in 641—38.2(136C) at the entire site or in any separate building or outdoor area that contains residual radioactivity such that the building or outdoor area is unsuitable for release in accordance with state of Iowa requirements;
- (3) No principal activities under the license have been conducted for a period of 24 months; or
- (4) No principal activities have been conducted for a period of 24 months in any separate building or outdoor area suitable for release in accordance with State of Iowa requirements.

e. Coincident with the notification required by 39.4(33)“d,” the licensee shall maintain in effect all decommissioning financial assurances established by the licensee pursuant to subrule 39.4(26) in conjunction with a license issuance or renewal or as required by this subrule. The amount of the financial assurance must be increased, or may be decreased, as appropriate, to cover the detailed cost estimate for decommissioning established pursuant to paragraph 39.4(33)“g.”

(1) Any licensee who has not provided financial assurance to cover the detailed cost estimate submitted with the decommissioning plan shall do so when this rule becomes effective on July 9, 1997.

(2) Following approval of the decommissioning plan, a licensee may reduce the amount of the financial assurance as decommissioning proceeds and radiological contamination is reduced at the site with the approval of the agency.

f. The agency may grant a request to extend the time periods established in 39.4(33)“d” if the agency determines that this request is not detrimental to the public health and safety and is otherwise in the public interest. The request must be submitted no later than 30 days before notification pursuant to 39.4(33)“d.” The schedule for decommissioning set forth in 39.4(33)“d” of this subrule may not commence until the agency has made a determination on the request.

g. A decommissioning plan must be submitted if required by license conditions or if the procedures and activities necessary to carry out decommissioning of the site or separate building or outdoor area have not been previously approved by the agency and these procedures could increase the potential health and safety impacts to workers or to the public.

- (1) Procedures having potential health and safety impacts include, but are not limited to:
 1. Procedures that would involve techniques not applied routinely during cleanup or maintenance operations;
 2. Workers that would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during operation;
 3. Procedures that could result in significantly greater airborne concentrations of radioactive material than are present during operation;
 4. Procedures could result in significantly greater releases of radioactive material to the environment than those associated with operation.

(2) The agency may approve an alternate schedule for submittal of a decommissioning plan required pursuant to 39.4(33)“d” of this subrule if the agency determines that the alternate schedule is necessary to the effective conduct of decommissioning operations and presents no undue risk from radiation to the public health and safety and is otherwise in the public interest.

(3) Procedures such as those listed in 39.4(33)“g” with potential health and safety impacts may not be carried out prior to approval of the decommissioning plan.

(4) The proposed decommissioning plan for the site or separate building or outdoor area must include:

1. A description of the conditions of the site or separate building or outdoor area sufficient to evaluate the acceptability of the plan;
2. A description of planned decommissioning activities;
3. A description of the methods used to ensure protection of workers and the environment against radiation hazards during decommissioning;
4. A description of the planned final radiation survey; and
5. An updated detailed cost estimate for decommissioning, and a plan for ensuring the availability of adequate funds for completion of decommissioning.
6. A description of the physical security plan and material control and accounting plan provisions in place during decommissioning.
7. For decommissioning plans calling for completion of decommissioning later than 24 months after plan approval, the plan shall include justification for the delay based on the criteria in paragraph "i" of this subrule.

(5) The proposed decommissioning plan will be approved by the agency if the information therein demonstrates that the decommissioning will be completed as soon as practicable and that the health and safety of workers and the public will be adequately protected.

h. Except as provided in 39.4(33) "i," licensees shall complete decommissioning of the site or separate building or outdoor area as soon as practicable but no later than 24 months following the initiation of decommissioning. When the decommissioning involves the entire site, the licensee shall request license termination as soon as practicable but no later than 24 months following the initiation of decommissioning.

i. The agency may approve a request for an alternative schedule for completion of decommissioning of the site or separate building or outdoor area, and license termination if appropriate, if the agency determines that the alternative is warranted by consideration of the following:

- (1) It is technically feasible to complete decommissioning within the allotted 24-month period;
- (2) Sufficient waste disposal capacity is available to allow completion of decommissioning within the allotted 24-month period;
- (3) A significant volume reduction exposure to workers can be achieved by allowing short-lived radionuclides to decay;
- (4) A significant reduction in radiation exposure to workers can be achieved by allowing short-lived radionuclides to decay; and
- (5) Other site-specific factors which the agency may consider appropriate on a case-by-case basis, such as the regulatory requirements of other government agencies, lawsuits, groundwater treatment activities, monitored natural groundwater restoration, actions that could result in more environmental harm than a deferred cleanup, and other factors beyond the controls of the licensee.

j. As the final step in decommissioning, the licensee shall:

- (1) Certify the disposition of all licensed material, including accumulated wastes, by submitting a completed IDPH Form 588-2793 or equivalent information; and
- (2) Conduct a radiation survey of the premises where the licensed activities were carried out and submit a report of the results of this survey unless the licensee demonstrates in some other manner that the premises are suitable for release in accordance with the criteria for decommissioning in 641—40.28(136C) through 641—40.31(136C). The licensee shall, as appropriate:

1. Report levels of gamma radiation in units of millisieverts (microrentgen) per hour at one meter from surfaces, and report the level of radioactivity, including alpha and beta, in units of disintegrations per minute or microcuries (megabecquerels) per 100 square centimeters (removable and fixed) for surfaces, microcuries (megabecquerels) per liter for water, and becquerels (picocuries) per gram for solids such as soils or concrete; and

2. Specify the survey instrument(s) used and certify that each instrument is properly calibrated and tested.

k. Specific licenses, including expired licenses, will be terminated by written notice to the licensee when the agency determines that:

- (1) By-product material has been properly disposed;

(2) Reasonable effort has been made to eliminate residual radioactive contamination, if present; and

(3) A radiation survey has been performed which demonstrates that the premises are suitable for release or other information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release in accordance with the criteria for decommissioning in 641—40.28(136C) through 641—40.31(136C).

(4) Records required by 39.4(52) “e” and 39.4(52) “g” have been received.

l. Prior to license termination, each licensee authorized to possess radioactive material with a half-life greater than 120 days, in an unsealed form, shall forward the following records to the agency:

(1) Disposal of licensed material (including burials authorized before January 28, 1981), made under 641—40.71(136C) through 40.74(136C); and

(2) Records required by 641—paragraph 40.82(2) “d.”

m. If licensed activities are transferred or assigned in accordance with 39.4(32) “b,” each licensee authorized to possess radioactive material with a half-life greater than 120 days, in an unsealed form, shall transfer the following records to the new licensee and the new licensee will be responsible for maintaining these records until the license is terminated:

(1) Records of disposal of licensed material (including burials authorized before January 28, 1981), made under 641—40.71(136C) through 40.74(136C); and

(2) Records required by 641—paragraph 40.82(2) “d.”

n. Prior to license termination, each licensee shall forward the records required by 39.4(26) “g” to the agency.

39.4(34) *Renewal of licenses.*

a. Applications for renewal of specific licenses shall be filed in accordance with 39.4(24) and include the fees required in 641—subrule 38.8(2).

b. In any case in which a licensee, not less than 30 days prior to expiration of an existing license, has filed an application in proper form for renewal or for a new license authorizing the same activities, such existing license shall not expire until final action by the agency.

39.4(35) *Amendment of licenses at request of licensee.* Applications for amendment of a license shall be filed in accordance with 39.4(24), include the fees required in 641—subrule 38.8(2), and shall specify the respects in which the licensee desires the license to be amended and the grounds for such amendment.

39.4(36) *Agency action on applications to renew or amend.* In considering an application by a licensee to renew or amend the license, the agency will apply the criteria set forth in 39.4(25), 39.4(27), 39.4(28), and 39.4(29) and in 641—Chapters 38, 40, 41, 42, 43, 44 and 45, as applicable.

39.4(37) *Persons possessing a license for source, by-product, or special nuclear material in quantities not sufficient to form a critical mass on effective date of these rules.* Any person who, on the effective date of these rules, possesses a general or specific license issued by the U.S. Nuclear Regulatory Commission for source, by-product, or special nuclear material in quantities not sufficient to form a critical mass, shall be deemed to possess a like license issued under this chapter and the Iowa Code, such license to expire either 90 days after receipt from the agency of a notice of expiration of such license, or on the date or expiration specified in the U.S. Nuclear Regulatory Commission license, whichever is earlier.

39.4(38) *Persons possessing naturally occurring and accelerator-produced radioactive material on effective date of these rules.* Any person who, on the effective date of these rules, possesses NARM for which a specific license is required by the Iowa Code or this chapter shall be deemed to possess such a license issued under the Iowa Code and this chapter. Such license shall expire 90 days after the effective date of these rules; provided, however, that if within the 90 days the person possessing such material files an application in proper form for a license, such existing license shall not expire until the application has been finally determined by the agency.

39.4(39) *Requirements for license to initially transfer source material for use under a general license.* An application for a specific license to initially transfer source material for use under 39.4(21), or equivalent regulations of an agreement state or the Nuclear Regulatory Commission, will be approved if:

- a. The applicant satisfies the general requirements specified in 39.4(25); and
- b. The applicant submits adequate information on, and the agency approves the methods to be used for, quality control, labeling, and providing safety instructions to recipients.

39.4(40) *Conditions of licenses to initially transfer source material for use under general license: quality control, labeling, safety instructions, and records and reports.*

a. Each person licensed under 39.4(39) shall label the immediate container of each quantity of source material with the type of source material and quantity of material and the words “radioactive material.”

b. Each person licensed under 39.4(39) shall ensure that the quantities and concentrations of source material are as labeled and indicated in any transfer records.

c. Each person licensed under 39.4(39) shall provide the information specified in this paragraph to each person to whom source material is transferred for use under 39.4(21) or equivalent provisions in agreement state or Nuclear Regulatory Commission regulations. This information must be transferred before the source material is transferred for the first time in each calendar year to the particular recipient. The required information includes:

(1) A copy of 39.4(21) and 39.4(41) or relevant equivalent regulations of the agreement state or Nuclear Regulatory Commission.

(2) Appropriate radiation safety precautions and instructions relating to handling, use, storage, and disposal of the material.

d. Each person licensed under 39.4(39) shall report transfers as follows:

(1) File a report with the Iowa Department of Public Health, 321 East 12th Street, Des Moines, Iowa 50319. The report shall include the following information:

1. The name, address, and license number of the person who transferred the source material;

2. For each general licensee under 39.4(21) or equivalent agreement state or Nuclear Regulatory Commission provisions to whom greater than 50 grams (0.11 lb) of source material has been transferred in a single calendar quarter, the name and address of the general licensee to whom source material is distributed; a responsible agent, by name or position, or both, and telephone number, of the general licensee to whom the material was sent; and the type, physical form, and quantity of source material transferred; and

3. The total quantity of each type and physical form of source material transferred in the reporting period to all such generally licensed recipients.

(2) File a report with each responsible agreement state agency or the Nuclear Regulatory Commission that identifies all persons, operating under provisions equivalent to 39.4(21), to whom greater than 50 grams (0.11 lb) of source material has been transferred within a single calendar quarter. The report shall include the following information specific to those transfers made to the agreement state or Nuclear Regulatory Commission jurisdiction:

1. The name, address, and license number of the person who transferred the source material; and

2. The name and address of the general licensee to whom source material was distributed; a responsible agent, by name or position, or both, and telephone number, of the general licensee to whom the material was sent; and the type, physical form, and quantity of source material transferred; and

3. The total quantity of each type and physical form of source material transferred in the reporting period to all such generally licensed recipients within the agreement state or Nuclear Regulatory Commission jurisdiction.

(3) Submit each report by January 31 of each year covering all transfers for the previous calendar year. If no transfers were made to persons generally licensed under 39.4(21) or equivalent agreement state or Nuclear Regulatory Commission provisions during the current period, a report shall be submitted to the agency indicating so. If no transfers have been made to general licensees in a particular agreement state or Nuclear Regulatory Commission jurisdiction during the reporting period, this information shall be reported to the responsible agreement state agency or Nuclear Regulatory Commission upon request.

e. Each person licensed under 39.4(39) shall maintain all information that supports the reports required by these rules concerning each transfer to a general licensee for a period of one year after the

event is included in a report to the agency, the Nuclear Regulatory Commission or to an agreement state agency.

39.4(41) Transfer of material.

a. No licensee shall transfer radioactive material except as authorized pursuant to 39.4(41).

b. Except as otherwise provided in the license and subject to the provisions of 39.4(41) “*c*” and “*d*,” any licensee may transfer radioactive material:

(1) To the agency (a licensee may transfer material to the agency only after receiving prior approval from the agency);

(2) To the U.S. Department of Energy;

(3) To any person exempt from these rules to the extent permitted under such exemption;

(4) To any person authorized to receive such material under terms of a general license or its equivalent, or a specific license or equivalent licensing document, issued by the agency, the U.S. Nuclear Regulatory Commission, any agreement state or any licensing state, or to any person otherwise authorized to receive such material by the federal government or any agency thereof, the agency, an agreement state, or a licensing state; or

(5) As otherwise authorized by the agency in writing.

c. Before transferring radioactive material to a specific licensee of the agency, the U.S. Nuclear Regulatory Commission, an agreement state or a licensing state, or to a general licensee who is required to register with the agency, the U.S. Nuclear Regulatory Commission, an agreement state or a licensing state prior to receipt of the radioactive material, the licensee transferring the material shall verify that the transferee’s license authorizes the receipt of the type, form, and quantity of radioactive material to be transferred.

d. Any of the following methods for the verification required by 39.4(41) “*c*” is acceptable:

(1) The transferor may possess and read a current copy of the transferee’s specific license or registration certificate.

(2) The transferor may possess a written certification by the transferee that the transferee is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date.

(3) For emergency shipments, the transferor may accept oral certification by the transferee that the transferee is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date, provided that the oral certification is confirmed in writing within ten days.

(4) The transferor may obtain other information compiled by a reporting service from official records of the agency, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state regarding the identity of licensees and the scope and expiration dates of licenses and registration.

(5) When none of the methods of verification described in 39.4(41) “*d*”(1) through (4) are readily available or when a transferor desires to verify that information received by one of such methods is correct or up to date, the transferor may obtain and record confirmation from the agency, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state that the transferee is licensed to receive the radioactive material.

e. Shipment and transport of radioactive material shall be in accordance with the provisions of 641—39.5(136C).

39.4(42) to 39.4(50) Reserved.

39.4(51) Modification and revocation of licenses.

a. The terms and conditions of all licenses shall be subject to amendment, revision, or modification or the license may be suspended or revoked by reason of amendments to the Iowa Code, or by reason of rules, regulations, and orders issued by the agency.

b. Any license may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under provisions of the Iowa Code, or because of conditions revealed by such application or statement of fact or any report, record, or inspection or other means which would warrant the agency to refuse to grant a license on an original application, or

for violation of, or failure to observe any of the terms and conditions of the Iowa Code, or of the license, or of any rule, regulation, or order of the agency.

c. Except in cases of willfulness or those in which the public health, interest or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of proceedings therefor, facts or conduct which may warrant such action shall have been called to the attention of the licensee in writing and the licensee shall have been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.

39.4(52) Records.

a. Each person who receives source or by-product material pursuant to a license issued pursuant to these rules shall keep records showing the receipt, transfer, and disposal of the source or by-product material as follows:

(1) The licensee shall retain each record of receipt of the source or by-product material as long as the material is possessed and for three years following transfer or disposition of the source or by-product material.

(2) The licensee who transferred the material shall retain each record of transfer of the source or by-product material until the agency terminates each license that authorizes the activity that is subject to the record-keeping requirement.

(3) The licensee who disposed of the material shall retain each record of disposal of the source or by-product material until the agency terminates each license that authorizes disposal of the material.

b. The licensee shall retain each record that is required by these rules or by license condition for the period specified by the appropriate rule or license condition; the record must be retained until the agency terminates each license that authorizes the activity that is subject to the record-keeping requirements.

c. Records which must be maintained may be the original or a reproduced copy or microfilm if such reproduced copy or microfilm is duly authenticated by authorized personnel and the microfilm is capable of producing a clear and legible copy after storage for the period specified by agency regulations. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records such as letters, drawings and specifications must include all pertinent information such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records.

d. If there is a conflict between the agency's rules or other written agency approval or authorization pertaining to the retention period for the same type of record, the retention period specified in these rules for such records shall apply unless the agency has granted a specific exemption from the record retention requirements specified in agency rules.

e. Prior to license termination, each licensee authorized to possess radioactive material with a half-life greater than 120 days, in an unsealed form, shall forward the following records to the agency:

(1) Records of disposal of licensed material made under 641—40.71(136C) (including burials authorized before January 28, 1981) to 641—40.74(136C); and

(2) Records required by 641—paragraph 40.82(2)“*d.*”

f. If licensed activities are transferred or assigned, each licensee authorized to possess radioactive material, with a half-life greater than 120 days, in an unsealed form, shall transfer the following records to the new licensee and the new licensee will be responsible for maintaining these records until the license is terminated:

(1) Records of disposal of licensed material made under 40.71(136C) (including burials authorized before January 28, 1981) to 641—40.74(136C); and

(2) Records required by 641—paragraph 40.82(2)“*d.*”

g. Prior to license termination, each licensee shall forward the records required by subrule 39.4(26) to the agency.

39.4(53) to 39.4(89) Reserved.

39.4(90) Reciprocal recognition of licenses.

a. Licenses of by-product, source, and special nuclear material in quantities not sufficient to form a critical mass.

(1) Subject to 641—Chapter 39, any person who holds a specific license from the U.S. Nuclear Regulatory Commission or an agreement state, and issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in such licensing document within this state for a period not in excess of 180 days in a one-year period. The one-year period starts on the day the licensee's reciprocity fee, as specified in 641—subrule 38.8(8), is received by the agency and ends exactly 365 days later. Licensees are responsible for ensuring they do not exceed the 180-day limit within the one-year period and must apply for renewal 30 days prior to the expiration date of the one-year reciprocal recognition period. Out-of-state persons wishing to operate in the state in excess of 180 calendar days must obtain an Iowa radioactive materials license.

(2) The licensing document referenced in 39.4(90) "a"(1) shall not limit the activity authorized by such document to specified installations or locations.

(3) The out-of-state licensee shall notify the agency in writing at least three working days prior to engaging in activities in the state. Such notification shall indicate the location, period, and type of proposed possession and use within the state, and shall be accompanied by a copy of the pertinent licensing document initially. If, for a specific case, the three-day period would impose an undue hardship on the out-of-state licensee, the licensee may, upon application to the agency, obtain permission to proceed sooner. The agency may waive the requirement for filing additional written notifications during the remainder of the one-year reciprocity period following the receipt of the initial notification from a person engaging in activities under the general license provided by 39.4(90) "a."

(4) The out-of-state licensee shall comply with all applicable rules of the agency and with all the terms and conditions of the licensing document, except any such terms and conditions which may be inconsistent with applicable rules of the agency.

(5) The out-of-state licensee shall supply other information as the agency may request.

(6) The out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided by 39.4(90) "a" except by transfer to a person specifically licensed by the agency, another agreement state or the U.S. Nuclear Regulatory Commission to receive such material.

(7) Notwithstanding the provisions of 39.4(90) "a"(1), any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission or an agreement state authorizing the holder to manufacture, transfer, install, or service a device described in 39.4(22) "d"(1) within areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate, or service such a device in this state provided that:

1. Such person shall file a report with the agency within 30 days after the end of each calendar quarter in which any device is transferred to or installed in this state. Each such report shall identify each general licensee to whom such device is transferred by name and address, the type of device transferred, and the quantity and type of radioactive material contained in the device;

2. The device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to such person by the U.S. Nuclear Regulatory Commission or an agreement state;

3. Such person shall ensure that any labels required to be affixed to the device under regulations of the authority which licensed manufacture of the device bear a statement that "Removal of this label is prohibited"; and

4. The holder of the specific license shall furnish to each general licensee to whom the holder transfers such device or on whose premises the holder installs such device a copy of the general license contained in 39.4(22) "d" or in equivalent regulations of the agency having jurisdiction over the manufacture and distribution of the device.

(8) The agency may withdraw, limit, or qualify its acceptance of any specific license or equivalent licensing document issued by the U.S. Nuclear Regulatory Commission or an agreement state, or any product distributed pursuant to such licensing document, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

(9) The agency may revoke or suspend an out-of-state radiographer's ID card issued by the U.S. Nuclear Regulatory Commission, a licensing state, or another agreement state in accordance with the provisions of 641—45.1(10) "h."

b. Licenses of naturally occurring or accelerator-produced radioactive material.

(1) Subject to 641—Chapter 39, any person who holds a specific license from the U.S. Nuclear Regulatory Commission or an agreement state, and issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in such licensing document within this state for a period not in excess of 180 days in a one-year period. The one-year period starts on the day the licensee's reciprocity fee, as specified in 641—subrule 38.8(8), is received by the agency and ends exactly 365 days later. Licensees are responsible for ensuring they do not exceed the 180-day limit within the one-year period and must apply for renewal 30 days prior to the expiration date of the one-year reciprocal recognition period. Out-of-state persons wishing to operate in the state in excess of 180 calendar days must obtain an Iowa radioactive materials license, which requires that the person have a permanent office in Iowa where records are maintained pertaining to licensed activities and where material can be stored, and must have at least one full-time employee and a telephone.

(2) The licensing document referenced in 39.4(90) "a"(1) shall not limit the activity authorized by such document to specified installations or locations.

(3) The out-of-state licensee shall notify the agency in writing at least three days prior to engaging in activities in the state. Such notification shall indicate the location, period, and type of proposed possession and use within the state, and shall be accompanied by a copy of the pertinent licensing document initially. If, for a specific case, the three-day period would impose an undue hardship on the out-of-state licensee, the licensee may, upon application to the agency, obtain permission to proceed sooner. The agency may waive the requirement for filing additional written notifications during the remainder of the one-year reciprocity period following the receipt of the initial notification from a person engaging in activities under the general license provided by 39.4(90) "b."

(4) The out-of-state licensee shall comply with all applicable rules of the agency and with all the terms and conditions of the licensing document, except any such terms and conditions which may be inconsistent with applicable rules of the agency.

(5) The out-of-state licensee shall supply other information as the agency may request.

(6) The out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided by 39.4(90) "b" except by transfer to a person:

1. Specifically licensed by the agency, another agreement state or the U.S. Nuclear Regulatory Commission to receive such material, or

2. Exempt from the requirements for a license for such material under 39.4(3) "a."

(7) Notwithstanding the provisions of 39.4(90) "b"(1), any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission or an agreement state authorizing the holder to manufacture, transfer, install, or service a device described in 39.4(22) "d"(1) within areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate, or service such a device in this state provided that:

1. Such person shall file a report with the agency within 30 days after the end of each calendar quarter in which any device is transferred to or installed in this state. Each such report shall identify each general licensee to whom such device is transferred by name and address, the type of device transferred, and the quantity and type of radioactive material contained in the device;

2. The device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to such person by the U.S. Nuclear Regulatory Commission or an agreement state;

3. Such person shall ensure that any labels required to be affixed to the device under regulations of the authority which licensed manufacture of the device bear a statement that "Removal of this label is prohibited"; and

4. The holder of the specific license shall furnish to each general licensee to whom the holder transfers such device or on whose premises the holder installs such device a copy of the general license contained in 39.4(22) “d” or in equivalent regulations of the agency having jurisdiction over the manufacture and distribution of the device.

(8) The agency may withdraw, limit, or qualify its acceptance of any specific license or equivalent licensing document issued by the U.S. Nuclear Regulatory Commission or an agreement state, or any product distributed pursuant to such licensing document, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

(9) The agency may revoke or suspend an out-of-state radiographer’s ID card issued by the U.S. Nuclear Regulatory Commission, a licensing state, or another agreement state in accordance with the provisions of 641—45.1(10) “h.”

39.4(91) to 39.4(104) Reserved.

[ARC 7983B, IAB 7/29/09, effective 9/2/09; ARC 8982B, IAB 8/11/10, effective 9/15/10; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—39.5(136C) Transportation of radioactive material.

39.5(1) All persons who transport radioactive material or deliver radioactive material to a carrier for transport must comply with the applicable provisions contained in 10 CFR Part 71 and 49 CFR Parts 170 through 189. The regulations in 10 CFR Part 71 apply to any licensee authorized by specific or general license to receive, possess, use, or transfer licensed material, if the licensee delivers that material to a carrier for transport, transports the material outside the site of usage, or transports that material on public highways. No provision of 10 CFR Part 71 authorizes possession of licensed material.

39.5(2) The provisions of 10 CFR Part 71 are subject to the following conditions.

a. Not adopted by reference are 10 CFR 71.11, 71.14(b), 71.19, 71.31, 71.33, 71.35, 71.37, 71.38, 71.39, 71.41, 71.43, 71.45, 71.51, 71.55, 71.59, 71.61, 71.63, 71.64, 71.65, 71.70, 71.71, 71.73, 71.74, 71.75, 71.77, 71.85(a)-(c), 71.91(b), 71.101(c)(2), 71.101(d), 71.101(e), 71.107, 71.109, 71.111, 71.113, 71.115, 71.117, 71.119, 71.121, 71.123, and 71.125.

b. Where the words “NRC”, “Commission”, “Nuclear Regulatory Commission”, “United States Nuclear Regulatory Commission” or “Administrator of the appropriate Regional Office” appear in 10 CFR Part 71, substitute the words “Iowa Department of Public Health” except when used in 10 CFR 71.5(b), 71.10, 71.17(c)(3), 71.17(e), 71.85(c), 71.88(a)(4), 71.93(c), 71.95, 71.97(c), 71.97(c)(3)(iii), and 71.97(f).

c. The terms “certificate of compliance” and “compliance holder or applicant” apply to the NRC as it is the sole authority for issuing a package certificate of compliance.

d. Iowa form “Notice to Employees” must be posted instead of NRC Form 3 that is specified in 10 CFR Part 71.

[ARC 3746C, IAB 4/11/18, effective 5/16/18]

CHAPTER 39—APPENDIX A
EXEMPT CONCENTRATIONS

| Element (atomic number) | Radionuclide | Column I Gas concentration $\mu\text{Ci/ml}$ <u>1/</u> | Column II Liquid and solid concentration $\mu\text{Ci/ml}$ <u>2/</u> |
|----------------------------|---------------|---|--|
| Antimony (51) | Sb-122 | | 3×10^{-4} |
| | Sb-124 | | 2×10^{-4} |
| | Sb-125 | | 1×10^{-3} |
| Argon (18) | Ar-37 | 1×10^{-3} | |
| | Ar-41 | 4×10^{-7} | |
| Arsenic (33) | As-73 | | 5×10^{-3} |
| | As-74 | | 5×10^{-4} |
| | As-76 | | 2×10^{-4} |
| | As-77 | | 8×10^{-4} |
| Barium (56) | Ba-131 | | 2×10^{-3} |
| | Ba-140 | | 3×10^{-4} |
| Beryllium (4) | Be-7 | | 2×10^{-2} |
| Bismuth (83) | Bi-206 | | 4×10^{-4} |
| Bromine (35) | Br-82 | 4×10^{-7} | 3×10^{-3} |
| Cadmium (48) | Cd-109 | | 2×10^{-3} |
| | Cd-115m | | 3×10^{-4} |
| | Cd-115 | | 3×10^{-4} |
| Calcium (20) | Ca-45 | | 9×10^{-5} |
| | Ca-47 | | 5×10^{-4} |
| Carbon (6) | C-14 | 1×10^{-6} | 8×10^{-3} |
| Cerium (58) | Ce-141 | | 9×10^{-4} |
| | Ce-143 | | 4×10^{-4} |
| | Ce-144 | | 1×10^{-4} |
| Cesium (55) | Cs-131 | | 2×10^{-2} |
| | Cs-134m | | 6×10^{-2} |
| | Cs-134 | | 9×10^{-5} |
| Chlorine (17) | Cl-38 | 9×10^{-7} | 4×10^{-3} |
| Chromium (24) | Cr-51 | | 2×10^{-2} |
| Cobalt (27) | Co-57 | | 5×10^{-3} |
| | Co-58 | | 1×10^{-3} |
| | Co-60 | | 5×10^{-4} |
| Copper (29) | Cu-64 | | 3×10^{-3} |
| Dysprosium (66) | Dy-165 | | 4×10^{-3} |
| | Dy-166 | | 4×10^{-4} |
| Erbium (68) | Er-169 | | 9×10^{-4} |
| | Er-171 | | 1×10^{-3} |
| Europium (63) | Eu-152(9.2 h) | | 6×10^{-4} |
| | Eu-155 | | 2×10^{-3} |
| Fluorine (9) | F-18 | 2×10^{-6} | 8×10^{-3} |

| Element (atomic number) | Radionuclide | Column I Gas concentration $\mu\text{Ci/ml}$ <u>1/</u> | Column II Liquid and solid concentration $\mu\text{Ci/ml}$ <u>2/</u> |
|----------------------------|--------------|---|--|
| Gadolinium (64) | Gd-153 | | 2×10^{-3} |
| | Gd-159 | | 8×10^{-4} |
| Gallium (31) | Ga-72 | | 4×10^{-4} |
| Germanium (32) | Ge-71 | | 2×10^{-2} |
| Gold (79) | Au-196 | | 2×10^{-3} |
| | Au-198 | | 5×10^{-4} |
| | Au-199 | | 2×10^{-3} |
| Hafnium (72) | Hf-181 | | 7×10^{-4} |
| Hydrogen (1) | H-3 | 5×10^{-6} | 3×10^{-2} |
| Indium (49) | In-113m | | 1×10^{-2} |
| | In-114m | | 2×10^{-4} |
| Iodine (53) | I-126 | 3×10^{-9} | 2×10^{-5} |
| | I-131 | 3×10^{-9} | 2×10^{-5} |
| | I-132 | 8×10^{-8} | 6×10^{-4} |
| | I-133 | 1×10^{-8} | 7×10^{-5} |
| | I-134 | 2×10^{-7} | 1×10^{-3} |
| Iridium (77) | Ir-190 | | 2×10^{-3} |
| | Ir-192 | | 4×10^{-4} |
| | Ir-194 | | 3×10^{-4} |
| Iron (26) | Fe-55 | | 8×10^{-3} |
| | Fe-59 | | 6×10^{-4} |
| Krypton (36) | Kr-85m | 1×10^{-6} | |
| | Kr-85 | 3×10^{-6} | |
| Lanthanum (57) | La-140 | | 2×10^{-4} |
| Lead (82) | Pb-203 | | 4×10^{-3} |
| Lutetium (71) | Lu-177 | | 1×10^{-3} |
| Manganese (25) | Mn-52 | | 3×10^{-4} |
| | Mn-54 | | 1×10^{-3} |
| | Mn-56 | | 1×10^{-3} |
| Mercury (80) | Hg-197m | | 2×10^{-3} |
| | Hg-197 | | 3×10^{-3} |
| | Hg-203 | | 2×10^{-4} |
| Molybdenum (42) | Mo-99 | | 2×10^{-3} |
| Neodymium (60) | Nd-147 | | 6×10^{-4} |
| | Nd-149 | | 3×10^{-3} |
| Nickel (28) | Ni-65 | | 1×10^{-3} |
| Niobium (Columbium) (41) | Nb-95 | | 1×10^{-3} |
| | Nb-97 | | 9×10^{-3} |
| Osmium (76) | Os-185 | | 7×10^{-4} |
| | Os-191m | | 3×10^{-2} |
| | Os-191 | | 2×10^{-3} |
| | Os-193 | | 6×10^{-4} |

| Element (atomic number) | Radionuclide | Column I | Column II |
|----------------------------|--------------|--|--|
| | | Gas concentration $\mu\text{Ci/ml}$ <u>1/</u> | Liquid and solid concentration $\mu\text{Ci/ml}$ <u>2/</u> |
| Palladium (46) | Pd-103 | | 3×10^{-3} |
| | Pd-109 | | 9×10^{-4} |
| Phosphorus (15) | P-32 | | 2×10^{-4} |
| Platinum (78) | Pt-191 | | 1×10^{-3} |
| | Pt-193m | | 1×10^{-2} |
| | Pt-197m | | 1×10^{-2} |
| | Pt-197 | | 1×10^{-3} |
| Potassium (19) | K-42 | | 3×10^{-3} |
| Praseodymium (59) | Pr-142 | | 3×10^{-4} |
| | Pr-143 | | 5×10^{-4} |
| Promethium (61) | Pm-147 | | 2×10^{-3} |
| | Pm-149 | | 4×10^{-4} |
| Rhenium (75) | Re-183 | | 6×10^{-3} |
| | Re-186 | | 9×10^{-4} |
| | Re-188 | | 6×10^{-4} |
| Rhodium (45) | Rh-103m | | 1×10^{-1} |
| | Rh-105 | | 1×10^{-3} |
| Rubidium (37) | Rb-86 | | 7×10^{-4} |
| Ruthenium (44) | Ru-97 | | 4×10^{-3} |
| | Ru-103 | | 8×10^{-4} |
| | Ru-105 | | 1×10^{-3} |
| | Ru-106 | | 1×10^{-4} |
| Samarium (62) | Sm-153 | | 8×10^{-4} |
| Scandium (21) | Sc-46 | | 4×10^{-4} |
| | Sc-47 | | 9×10^{-4} |
| | Sc-48 | | 3×10^{-4} |
| Selenium (34) | Se-75 | | 3×10^{-3} |
| Silicon (14) | Si-31 | | 9×10^{-3} |
| Silver (47) | Ag-105 | | 1×10^{-3} |
| | Ag-110m | | 3×10^{-4} |
| | Ag-111 | | 4×10^{-4} |
| Sodium (11) | Na-24 | | 2×10^{-3} |
| Strontium (38) | Sr-85 | | 1×10^{-3} |
| | Sr-89 | | 1×10^{-4} |
| | Sr-91 | | 7×10^{-4} |
| | Sr-92 | | 7×10^{-4} |
| Sulfur (16) | S-35 | 9×10^{-8} | 6×10^{-4} |
| Tantalum (73) | Ta-182 | | 4×10^{-4} |
| Technetium (43) | Tc-96m | | 1×10^{-1} |
| | Tc-96 | | 1×10^{-3} |
| Tellurium (52) | Te-125m | | 2×10^{-3} |
| | Te-127m | | 6×10^{-4} |

| Element (atomic number) | Radionuclide | Column I Gas concentration $\mu\text{Ci/ml}$ <u>1/</u> | Column II Liquid and solid concentration $\mu\text{Ci/ml}$ <u>2/</u> |
|---|--------------|---|--|
| | Te-127 | | 3×10^{-3} |
| | Te-129m | | 3×10^{-4} |
| | Te-131m | | 6×10^{-4} |
| | Te-132 | | 3×10^{-4} |
| Terbium (65) | Tb-160 | | 4×10^{-4} |
| Thallium (81) | Tl-200 | | 4×10^{-3} |
| | Tl-201 | | 3×10^{-3} |
| | Tl-202 | | 1×10^{-3} |
| | Tl-204 | | 1×10^{-3} |
| Thulium (69) | Tm-170 | | 5×10^{-4} |
| | Tm-171 | | 5×10^{-3} |
| Tin (50) | Sn-113 | | 9×10^{-4} |
| | Sn-125 | | 2×10^{-4} |
| Tungsten (Wolfram) (74) | W-181 | | 4×10^{-3} |
| | W-187 | | 7×10^{-4} |
| Vanadium (23) | V-48 | | 3×10^{-4} |
| Xenon (54) | Xe-131m | 4×10^{-6} | |
| | Xe-133 | 3×10^{-6} | |
| | Xe-135 | 1×10^{-6} | |
| Ytterbium (70) | Yb-175 | | 1×10^{-3} |
| Yttrium (39) | Y-90 | | 2×10^{-4} |
| | Y-91m | | 3×10^{-2} |
| | Y-91 | | 3×10^{-4} |
| | Y-92 | | 6×10^{-4} |
| | Y-93 | | 3×10^{-4} |
| Zinc (30) | Zn-65 | | 1×10^{-3} |
| | Zn-69m | | 7×10^{-4} |
| | Zn-69 | | 2×10^{-2} |
| Zirconium (40) | Zr-95 | | 6×10^{-4} |
| | Zr-97 | | 2×10^{-4} |
| Beta- and/or gamma-emitting radioactive material not listed above with half-life of less than 3 years. | | 1×10^{-10} | 1×10^{-6} |

1/ Values are given in Column I only for those materials normally used as gases.

2/ $\mu\text{Ci/g}$ for solids.

NOTE 1: Many radionuclides transform into other radionuclides. In expressing the concentrations in Appendix A, the activity stated is that of the parent radionuclide and takes into account the radioactive decay products.

NOTE 2: For purposes of 39.4(3) where there is involved a combination of radionuclides, the limit for the combination should be derived as follows: Determine for each radionuclide in the product the ratio between the radioactivity concentration present in the product and the exempt radioactivity concentration established in Appendix A for the specific radionuclide when not in combination. The sum of such ratios may not exceed "1."

EXAMPLE: Concentration of Radionuclide A in Product +

Exempt concentration of Radionuclide A

Concentration of Radionuclide B in Product <1

Exempt concentration of Radionuclide B

NOTE 3: To convert $\mu\text{Ci/ml}$ to SI units of megabecquerels per liter multiply the above values by 37.

EXAMPLE: Zirconium (40) Zr-97 ($2 \times 10^{-4} \mu\text{Ci/ml}$ multiplied by 37 is equivalent to $74 \times 10^{-4} \text{MBq/l}$)

CHAPTER 39—APPENDIX B
EXEMPT QUANTITIES

| Radioactive Material | Microcuries |
|----------------------------|-------------|
| Antimony-122 (Sb 122) | 100 |
| Antimony-124 (Sb 124) | 10 |
| Antimony-125 (Sb 125) | 10 |
| Arsenic-73 (As 73) | 100 |
| Arsenic-74 (As 74) | 10 |
| Arsenic-76 (As 76) | 10 |
| Arsenic-77 (As 77) | 100 |
| Barium-131 (Ba 131) | 10 |
| Barium-133 (Ba 133) | 10 |
| Barium-140 (Ba 140) | 10 |
| Bismuth-210 (Bi 210) | 1 |
| Bromine-82 (Br 82) | 10 |
| Cadmium-109 (Cd 109) | 10 |
| Cadmium-115m (Cd 115m) | 10 |
| Cadmium-115 (Cd 115) | 100 |
| Calcium-45 (Ca 45) | 10 |
| Calcium-47 (Ca 47) | 10 |
| Carbon-14 (C 14) | 100 |
| Cerium-141 (Ce 141) | 100 |
| Cerium-143 (Ce 143) | 100 |
| Cerium-144 (Ce 144) | 1 |
| Cesium-129 (Cs 129) | 100 |
| Cesium-131 (Cs 131) | 1,000 |
| Cesium-134m (Cs 134m) | 100 |
| Cesium-134 (Cs 134) | 1 |
| Cesium-135 (Cs 135) | 10 |
| Cesium-136 (Cs 136) | 10 |
| Cesium-137 (Cs 137) | 10 |
| Chlorine-36 (Cl 36) | 10 |
| Chlorine-38 (Cl 38) | 10 |
| Chromium-51 (Cr 51) | 1,000 |
| Cobalt-57 (Co 57) | 100 |
| Cobalt-58m (Co 58m) | 10 |
| Cobalt-58 (Co 58) | 10 |
| Cobalt-60 (Co 60) | 1 |
| Copper-64 (Cu 64) | 100 |
| Dysprosium-165 (Dy 165) | 10 |
| Dysprosium-166 (Dy 166) | 100 |
| Erbium-169 (Er 169) | 100 |
| Erbium-171 (Er 171) | 100 |
| Europium-152 (Eu 152)9.2h | 100 |
| Europium-152 (Eu 152)13 yr | 1 |

| Radioactive Material | Microcuries |
|-------------------------|-------------|
| Europium-154 (Eu 154) | 1 |
| Europium-155 (Eu 155) | 10 |
| Fluorine-18 (F 18) | 1,000 |
| Gadolinium-153 (Gd 153) | 10 |
| Gadolinium-159 (Gd 159) | 100 |
| Gallium-67 (Ga 67) | 100 |
| Gallium-72 (Ga 72) | 10 |
| Germanium-68 (Ge 68) | 10 |
| Germanium-71 (Ge 71) | 100 |
| Gold-195 (Au 195) | 10 |
| Gold-198 (Au 198) | 100 |
| Gold-199 (Au 199) | 100 |
| Hafnium-181 (Hf 181) | 10 |
| Holmium-166 (Ho 166) | 100 |
| Hydrogen-3 (H 3) | 1,000 |
| Indium-111 (In 111) | 100 |
| Indium-113m (In 113m) | 100 |
| Indium-114m (In 114m) | 10 |
| Indium-115m (In 115m) | 100 |
| Indium-115 (In 115) | 10 |
| Iodine-123 (I 123) | 100 |
| Iodine-125 (I 125) | 1 |
| Iodine-126 (I 126) | 1 |
| Iodine-129 (I 129) | 0.1 |
| Iodine-131 (I 131) | 1 |
| Iodine-132 (I 132) | 10 |
| Iodine-133 (I 133) | 1 |
| Iodine-134 (I 134) | 10 |
| Iodine-135 (I 135) | 10 |
| Iridium-192 (Ir 192) | 10 |
| Iridium-194 (Ir 194) | 100 |
| Iron-52 (Fe 52) | 10 |
| Iron-55 (Fe 55) | 100 |
| Iron-59 (Fe 59) | 10 |
| Krypton-85 (Kr 85) | 100 |
| Krypton-87 (Kr 87) | 10 |
| Lanthanum-140 (La 140) | 10 |
| Lutetium-177 (Lu 177) | 100 |
| Manganese-52 (Mn 52) | 10 |
| Manganese-54 (Mn 54) | 10 |
| Manganese-56 (Mn 56) | 10 |
| Mercury-197m (Hg 197m) | 100 |
| Mercury-197 (Hg 197) | 100 |
| Mercury-203 (Hg 203) | 10 |

| Radioactive Material | Microcuries |
|---------------------------|-------------|
| Molybdenum-99 (Mo 99) | 100 |
| Neodymium-147 (Nd 147) | 100 |
| Neodymium-149 (Nd 149) | 100 |
| Nickel-59 (Ni 59) | 100 |
| Nickel-63 (Ni 63) | 10 |
| Nickel-65 (Ni 65) | 100 |
| Niobium-93m (Nb 93m) | 10 |
| Niobium-95 (Nb 95) | 10 |
| Niobium-97 (Nb 97) | 10 |
| Osmium-185 (Os 185) | 10 |
| Osmium-191m (Os 191m) | 100 |
| Osmium-191 (Os 191) | 100 |
| Osmium-193 (Os 193) | 100 |
| Palladium-103 (Pd 103) | 100 |
| Palladium-109 (Pd 109) | 100 |
| Phosphorus-32 (P 32) | 10 |
| Platinum-191 (Pt 191) | 100 |
| Platinum-193m (Pt 193m) | 100 |
| Platinum-193 (Pt 193) | 100 |
| Platinum-197m (Pt 197m) | 100 |
| Platinum-197 (Pt 197) | 100 |
| Polonium-210 (Po 210) | 0.1 |
| Potassium-42 (K 42) | 10 |
| Potassium-43 (K 43) | 10 |
| Praseodymium-142 (Pr 142) | 100 |
| Praseodymium-143 (Pr 143) | 100 |
| Promethium-147 (Pm 147) | 10 |
| Promethium-149 (Pm 149) | 10 |
| Rhenium-186 (Re 186) | 100 |
| Rhenium-188 (Re 188) | 100 |
| Rhodium-103m (Rh 103m) | 100 |
| Rhodium-105 (Rh 105) | 100 |
| Rubidium-81 (Rb 81) | 10 |
| Rubidium-86 (Rb 86) | 10 |
| Rubidium-87 (Rb 87) | 10 |
| Ruthenium-97 (Ru 97) | 100 |
| Ruthenium-103 (Ru 103) | 10 |
| Ruthenium-105 (Ru 105) | 10 |
| Ruthenium-106 (Ru 106) | 1 |
| Samarium-151 (Sm 151) | 10 |
| Samarium-153 (Sm 153) | 100 |
| Scandium-46 (Sc 46) | 10 |
| Scandium-47 (Sc 47) | 100 |
| Scandium-48 (Sc 48) | 10 |

| Radioactive Material | Microcuries |
|--------------------------|-------------|
| Selenium-75 (Se 75) | 10 |
| Silicon-31 (Si 31) | 100 |
| Silver-105 (Ag 105) | 10 |
| Silver-110m (Ag 110m) | 1 |
| Silver-111 (Ag 111) | 100 |
| Sodium-22 (Na 22) | 10 |
| Sodium-24 (Na 24) | 10 |
| Strontium-85 (Sr 85) | 10 |
| Strontium-89 (Sr 89) | 1 |
| Strontium-90 (Sr 90) | 0.1 |
| Strontium-91 (Sr 91) | 10 |
| Strontium-92 (Sr 92) | 10 |
| Sulphur-35 (S 35) | 100 |
| Tantalum-182 (Ta 182) | 10 |
| Technetium-96 (Tc 96) | 10 |
| Technetium-97m (Tc 97m) | 100 |
| Technetium-97 (Tc 97) | 100 |
| Technetium-99m (Tc 99m) | 100 |
| Technetium-99 (Tc 99) | 10 |
| Tellurium-125m (Te 125m) | 10 |
| Tellurium-127m (Te 127m) | 10 |
| Tellurium-127 (Te 127) | 100 |
| Tellurium-129m (Te 129m) | 10 |
| Tellurium-129 (Te 129) | 100 |
| Tellurium-131m (Te 131m) | 10 |
| Tellurium-132 (Te 132) | 10 |
| Terbium-160 (Tb 160) | 10 |
| Thallium-200 (Tl 200) | 100 |
| Thallium-201 (Tl 201) | 100 |
| Thallium-202 (Tl 202) | 100 |
| Thallium-204 (Tl 204) | 10 |
| Thulium-170 (Tm 170) | 10 |
| Thulium-171 (Tm 171) | 10 |
| Tin-113 (Sn 113) | 10 |
| Tin-125 (Sn 125) | 10 |
| Tungsten-181 (W 181) | 10 |
| Tungsten-185 (W 185) | 10 |
| Tungsten-187 (W 187) | 100 |
| Vanadium-48 (V 48) | 10 |
| Xenon-131m (Xe 131m) | 1,000 |
| Xenon-133 (Xe 133) | 100 |
| Xenon-135 (Xe 135) | 100 |
| Ytterbium-175 (Yb 175) | 100 |
| Yttrium-87 (Y 87) | 10 |

| Radioactive Material | Microcuries |
|--|-------------|
| Yttrium-88 (Y 88) | 10 |
| Yttrium-90 (Y 90) | 10 |
| Yttrium-91 (Y 91) | 10 |
| Yttrium-92 (Y 92) | 100 |
| Yttrium-93 (Y 93) | 100 |
| Zinc-65 (Zn 65) | 10 |
| Zinc-69m (Zn 69m) | 100 |
| Zinc-69 (Zn 69) | 1,000 |
| Zirconium-93 (Zr 93) | 10 |
| Zirconium-95 (Zr 95) | 10 |
| Zirconium-97 (Zr 97) | 10 |
| Any radioactive material not listed above other than alpha-emitting radioactive material | 0.1 |

NOTE 1: For purposes of 39.4(25) “f”(5)“2” where there is involved a combination of radionuclides, the limit for the combination should be derived as follows:

Determine the amount of each radionuclide possessed and 1,000 times the amount in Appendix B for each of those radionuclides when not in combination. The sum of the ratios of those quantities may not exceed 1.

EXAMPLE:

$$\frac{\text{Amt. of Radionuclide A possessed}}{1000 \times \text{Appendix B quantity for Radionuclide A}} + \frac{\text{Amt. of Radionuclide B possessed}}{1000 \times \text{Appendix B quantity for Radionuclide B}} \leq 1$$

NOTE 2: To convert microcuries (μCi) to SI units of kilobecquerels (kBq), multiply the above values by 37.

EXAMPLE: Zirconium-97 (10 μCi multiplied by 37 is equivalent to 370 kBq).

CHAPTER 39—APPENDIX D

LIMITS FOR BROAD LICENSES (39.4(28))

| Radioactive Material | Column I curies | Column II curies |
|----------------------|--------------------|---------------------|
| Antimony-122 | 1 | 0.01 |
| Antimony-124 | 1 | 0.01 |
| Antimony-125 | 1 | 0.01 |
| Arsenic-73 | 10 | 0.1 |
| Arsenic-74 | 1 | 0.01 |
| Arsenic-76 | 1 | 0.01 |
| Arsenic-77 | 10 | 0.1 |
| Barium-131 | 10 | 0.1 |
| Barium-140 | 1 | 0.01 |
| Beryllium-7 | 10 | 0.1 |
| Bismuth-210 | 0.1 | 0.001 |
| Bromine-82 | 10 | 0.1 |
| Cadmium-109 | 1 | 0.01 |
| Cadmium-115m | 1 | 0.01 |
| Cadmium-115 | 10 | 0.1 |
| Calcium-45 | 1 | 0.01 |
| Calcium-47 | 10 | 0.1 |
| Carbon-14 | 100 | 1. |
| Cerium-141 | 10 | 0.1 |
| Cerium-143 | 10 | 0.1 |
| Cerium-144 | 0.1 | 0.001 |
| Cesium-131 | 100 | 1. |
| Cesium-134m | 100 | 1. |
| Cesium-134 | 0.1 | 0.001 |
| Cesium-135 | 1 | 0.01 |
| Cesium-136 | 10 | 0.1 |
| Cesium-137 | 0.1 | 0.001 |
| Chlorine-36 | 1 | 0.01 |
| Chlorine-38 | 100 | 1. |
| Chromium-51 | 100 | 1. |
| Cobalt-57 | 10 | 0.1 |
| Cobalt-58m | 100 | 1. |
| Cobalt-58 | 1 | 0.01 |
| Cobalt-60 | 0.1 | 0.001 |
| Copper-64 | 10 | 0.1 |
| Dysprosium-165 | 100 | 1. |
| Dysprosium-166 | 10 | 0.1 |
| Erbium-169 | 10 | 0.1 |
| Erbium-171 | 10 | 0.1 |
| Europium-152 (9.2 h) | 10 | 0.1 |
| Europium-152 (13 y) | 0.1 | 0.001 |

| Radioactive Material | Column I curies | Column II curies |
|----------------------|--------------------|---------------------|
| Europium-154 | 0.1 | 0.001 |
| Europium-155 | 1 | 0.01 |
| Fluorine-18 | 100 | 1. |
| Gadolinium-153 | 1 | 0.01 |
| Gadolinium-159 | 10 | 0.1 |
| Gallium-72 | 10 | 0.1 |
| Germanium-71 | 100 | 1. |
| Gold-198 | 10 | 0.1 |
| Gold-199 | 10 | 0.1 |
| Hafnium-181 | 1 | 0.01 |
| Holmium-166 | 10 | 0.1 |
| Hydrogen-3 | 100 | 1. |
| Indium-113m | 100 | 1. |
| Indium-114m | 1 | 0.01 |
| Indium-115m | 100 | 1. |
| Indium-115 | 1 | 0.01 |
| Iodine-125 | 0.1 | 0.001 |
| Iodine-126 | 0.1 | 0.001 |
| Iodine-129 | 0.1 | 0.001 |
| Iodine-131 | 0.1 | 0.001 |
| Iodine-132 | 10 | 0.1 |
| Iodine-133 | 1 | 0.01 |
| Iodine-134 | 10 | 0.1 |
| Iodine-135 | 1 | 0.01 |
| Iridium-192 | 1 | 0.01 |
| Iridium-194 | 10 | 0.1 |
| Iron-55 | 10 | 0.1 |
| Iron-59 | 1 | 0.01 |
| Krypton-85 | 100 | 1. |
| Krypton-87 | 10 | 0.1 |
| Lanthanum-140 | 1 | 0.01 |
| Lutetium-177 | 10 | 0.1 |
| Manganese-52 | 1 | 0.01 |
| Manganese-54 | 1 | 0.01 |
| Manganese-56 | 10 | 0.1 |
| Mercury-197m | 10 | 0.1 |
| Mercury-197 | 10 | 0.1 |
| Mercury-203 | 1 | 0.01 |
| Molybdenum-99 | 10 | 0.1 |
| Neodymium-147 | 10 | 0.1 |
| Neodymium-149 | 10 | 0.1 |
| Nickel-59 | 10 | 0.1 |
| Nickel-63 | 1 | 0.01 |
| Nickel-65 | 10 | 0.1 |

| Radioactive Material | Column I curies | Column II curies |
|----------------------|--------------------|---------------------|
| Niobium-93m | 1 | 0.01 |
| Niobium-95 | 1 | 0.01 |
| Niobium-97 | 100 | 1. |
| Osmium-185 | 1 | 0.01 |
| Osmium-191m | 100 | 1. |
| Osmium-191 | 10 | 0.1 |
| Osmium-193 | 10 | 0.1 |
| Palladium-103 | 10 | 0.1 |
| Palladium-109 | 10 | 0.1 |
| Phosphorus-32 | 1 | 0.01 |
| Platinum-191 | 10 | 0.1 |
| Platinum-193m | 100 | 1. |
| Platinum-193 | 10 | 0.1 |
| Platinum-197m | 100 | 1. |
| Platinum-197 | 10 | 0.1 |
| Polonium-210 | 0.01 | 0.0001 |
| Potassium-42 | 1 | 0.01 |
| Praseodymium-142 | 10 | 0.1 |
| Praseodymium-143 | 10 | 0.1 |
| Promethium-147 | 1 | 0.01 |
| Promethium-149 | 10 | 0.1 |
| Radium-226 | 0.01 | 0.0001 |
| Rhenium-186 | 10 | 0.1 |
| Rhenium-188 | 10 | 0.1 |
| Rhodium-103m | 1,000 | 10. |
| Rhodium-105 | 10 | 0.1 |
| Rubidium-86 | 1 | 0.01 |
| Rubidium-87 | 1 | 0.01 |
| Ruthenium-97 | 100 | 1. |
| Ruthenium-103 | 1 | 0.01 |
| Ruthenium-105 | 10 | 0.1 |
| Ruthenium-106 | 0.1 | 0.001 |
| Samarium-151 | 1 | 0.01 |
| Samarium-153 | 10 | 0.1 |
| Scandium-46 | 1 | 0.01 |
| Scandium-47 | 10 | 0.1 |
| Scandium-48 | 1 | 0.01 |
| Selenium-75 | 1 | 0.01 |
| Silicon-31 | 10 | 0.1 |
| Silver-105 | 1 | 0.01 |
| Silver-110m | 0.1 | 0.001 |
| Silver-111 | 10 | 0.1 |
| Sodium-22 | 0.1 | 0.001 |
| Sodium-24 | 1 | 0.01 |

| Radioactive Material | Column I curies | Column II curies |
|----------------------|--------------------|---------------------|
| Strontium-85m | 1,000 | 10. |
| Strontium-85 | 1 | 0.01 |
| Strontium-89 | 1 | 0.01 |
| Strontium-90 | 0.01 | 0.0001 |
| Strontium-91 | 10 | 0.1 |
| Strontium-92 | 10 | 0.1 |
| Sulphur-35 | 10 | 0.1 |
| Tantalum-182 | 1 | 0.01 |
| Technetium-96 | 10 | 0.1 |
| Technetium-97m | 10 | 0.1 |
| Technetium-97 | 10 | 0.1 |
| Technetium-99m | 100 | 1. |
| Technetium-99 | 1 | 0.01 |
| Tellurium-125m | 1 | 0.01 |
| Tellurium-127m | 1 | 0.01 |
| Tellurium-127 | 10 | 0.1 |
| Tellurium-129m | 1 | 0.01 |
| Tellurium-129 | 100 | 1. |
| Tellurium-131m | 10 | 0.1 |
| Tellurium-132 | 1 | 0.01 |
| Terbium-160 | 1 | 0.01 |
| Thallium-200 | 10 | 0.1 |
| Thallium-201 | 10 | 0.1 |
| Thallium-202 | 10 | 0.1 |
| Thallium-204 | 1 | 0.01 |
| Thulium-170 | 1 | 0.01 |
| Thulium-171 | 1 | 0.01 |
| Tin-113 | 1 | 0.01 |
| Tin-125 | 1 | 0.01 |
| Tungsten-181 | 1 | 0.01 |
| Tungsten-185 | 1 | 0.01 |
| Tungsten-187 | 10 | 0.1 |
| Vanadium-48 | 1 | 0.01 |
| Xenon-131m | 1,000 | 10. |
| Xenon-133 | 100 | 1. |
| Xenon-135 | 100 | 1. |
| Ytterbium-175 | 10 | 0.1 |
| Yttrium-90 | 1 | 0.01 |
| Yttrium-91 | 1 | 0.01 |
| Yttrium-92 | 10 | 0.1 |
| Yttrium-93 | 1 | 0.01 |
| Zinc-65 | 1 | 0.01 |

| Radioactive Material | Column I curies | Column II curies |
|---|--------------------|---------------------|
| Zinc-69m | 10 | 0.1 |
| Zinc-69 | 100 | 1. |
| Zirconium-93 | 1 | 0.01 |
| Zirconium-95 | 1 | 0.01 |
| Zirconium-97 | 1 | 0.01 |
| Any radioactive material other than source material, special nuclear material, or alpha-emitting radioactive material not listed above. | 0.1 | 0.001 |

NOTE 1: To convert curies (Ci) to SI units of gigabecquerels (GBq), multiply the above values by 37.

EXAMPLE: Zirconium-97 (Col. II) (0.01 Ci multiplied by 37 is equivalent to 0.37 GBq).

CHAPTER 39—APPENDIX E
DETERMINATION OF A_1 AND A_2
Rescinded IAB 4/5/00, effective 5/10/00

CHAPTER 39—APPENDIX F
CRITERIA RELATING TO USE OF FINANCIAL TESTS AND PARENT COMPANY
GUARANTEES FOR PROVIDING REASONABLE ASSURANCE
OF FUNDS FOR DECOMMISSIONING

I. Introduction.

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on obtaining a parent company guarantee that funds will be available for decommissioning costs and on a demonstration that the parent company passes a financial test. This appendix establishes criteria for passing the financial test and for obtaining the parent company guarantee.

II. Financial Test.

A. To pass the financial test, the parent company must meet the criteria of either paragraph A.1 or A.2 of this section:

1. The parent company must have:

(1) Two of the following three ratios: A ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; a ratio of current assets to current liabilities greater than 1.5; and

(2) Net working capital and tangible net worth each at least six times the current decommissioning cost estimates (or prescribed amount if a certification is used); and

(3) Tangible net worth of at least \$10 million; and

(4) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the current decommissioning cost estimates (or prescribed amount if a certification is used).

2. The parent company must have:

(1) A current rating for its most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, or Baa as issued by Moody's; and

(2) Tangible net worth at least six times the current decommissioning cost estimate (or prescribed amount if a certification is used); and

(3) Tangible net worth of at least \$10 million; and

(4) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the current decommissioning cost estimates (or prescribed amount if a certification is used).

B. The parent company's independent certified public accountant must have compared the data used by the parent company in the financial test, which is derived from the independently audited, year-end financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure the licensee shall inform BRH within 90 days or any matters coming to the auditor's attention which cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test.

C.1. After the initial financial test, the parent company must repeat the passage of the test within 90 days after the close of each succeeding fiscal year.

2. If the parent company no longer meets the requirements of paragraph A of this section, the licensee must send notice to the BRH of intent to establish alternate financial assurance as specified in BRH rules. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year-end financial data show that the parent company no longer meets the financial test requirements. The licensee must provide alternate financial assurance within 120 days after the end of such fiscal year.

III. Parent Company Guarantee.

The terms of a parent company guarantee which an applicant or licensee obtains must provide that:

A. The parent company guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the licensee and the BRH. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the licensee and BRH, as evidenced by the return receipts.

B. If the licensee fails to provide alternate financial assurance as specified in BRH rules within 90 days after receipt by the licensee and BRH notice of cancellation of the parent company guarantee from the guarantor, the guarantor will provide such alternative financial assurance in the name of the licensee.

C. The parent company guarantee and financial test provisions must remain in effect until the BRH has terminated the license.

D. If a trust is established for decommissioning costs, the trustee and trust must be acceptable to BRH. An acceptable trustee includes an appropriate state or federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.

CHAPTER 39—APPENDIX G

QUANTITIES OF RADIOACTIVE MATERIALS REQUIRING CONSIDERATION OF
THE NEED FOR AN EMERGENCY PLAN FOR RESPONDING TO A RELEASE

| <u>Radioactive Material</u> | <u>Release Fraction</u> | <u>Quantity (curies)</u> |
|-----------------------------|-------------------------|--------------------------|
| Actinium-228 | 0.001 | 4,000 |
| Americium-241 | .001 | 2 |
| Americium-242 | .001 | 2 |
| Americium-243 | .001 | 2 |
| Antimony-124 | .01 | 4,000 |
| Antimony-126 | .01 | 6,000 |
| Barium-133 | .01 | 10,000 |
| Barium-140 | .01 | 30,000 |
| Bismuth-207 | .01 | 5,000 |
| Bismuth-210 | .01 | 600 |
| Cadmium-109 | .01 | 1,000 |
| Cadmium-113 | .01 | 80 |
| Calcium-45 | .01 | 20,000 |
| Californium-252 | .001 | 9 (20 mg) |
| Carbon-14 | .01 | 50,000 |
| | Non CO | |
| Cerium-141 | .01 | 10,000 |
| Cerium-144 | .01 | 300 |
| Cesium-134 | .01 | 2,000 |
| Cesium-137 | .01 | 3,000 |
| Chlorine-36 | .5 | 100 |
| Chromium-51 | .01 | 300,000 |
| Cobalt-60 | .001 | 5,000 |
| Copper-64 | .01 | 200,000 |
| Curium-242 | .001 | 60 |
| Curium-243 | .001 | 3 |
| Curium-244 | .001 | 4 |
| Curium-245 | .001 | 2 |
| Europium-152 | .01 | 500 |
| Europium-154 | .01 | 400 |
| Europium-155 | .01 | 3,000 |
| Germanium-68 | .01 | 2,000 |
| Gadolinium-153 | .01 | 5,000 |
| Gold-198 | .01 | 30,000 |
| Hafnium-172 | .01 | 400 |
| Hafnium-173 | .01 | 7,000 |
| Holmium-166m | .01 | 100 |
| Hydrogen-3 | .5 | 20,000 |
| Iodine-125 | .5 | 10 |
| Iodine-131 | .5 | 10 |

| <u>Radioactive Material</u> | <u>Release Fraction</u> | <u>Quantity (curies)</u> |
|-----------------------------|-------------------------|--------------------------|
| Indium-114m | .01 | 1,000 |
| Iridium-192 | .001 | 40,000 |
| Iron-55 | .01 | 40,000 |
| Iron-59 | .01 | 7,000 |
| Krypton-85 | 1.0 | 6,000,000 |
| Lead-210 | .01 | 8 |
| Manganese-58 | .01 | 60,000 |
| Mercury-203 | .01 | 10,000 |
| Molybdenum-99 | .01 | 30,000 |
| Neptunium-237 | .001 | 2 |
| Nickel-63 | .01 | 20,000 |
| Niobium-94 | .01 | 300 |
| Phosphorus-32 | .5 | 100 |
| Phosphorus-33 | .5 | 1,000 |
| Polonium-210 | .01 | 10 |
| Potassium-42 | .01 | 9,000 |
| Promethium-145 | .01 | 4,000 |
| Promethium-147 | .01 | 4,000 |
| Radium-226 | .001 | 100 |
| Ruthenium-106 | .01 | 200 |
| Samarium-151 | .01 | 4,000 |
| Scandium-46 | .01 | 3,000 |
| Selenium-75 | .01 | 10,000 |
| Silver-110m | .01 | 1,000 |
| Sodium-22 | .01 | 9,000 |
| Sodium-24 | .01 | 10,000 |
| Strontium-89 | .01 | 3,000 |
| Strontium-90 | .01 | 90 |
| Sulfur-35 | .5 | 900 |
| Technetium-99 | .01 | 10,000 |
| Technetium-99m | .01 | 400,000 |
| Tellurium-127m | .01 | 5,000 |
| Tellurium-129m | .01 | 5,000 |
| Terbium-160 | .01 | 4,000 |
| Thulium-170 | .01 | 4,000 |
| Tin-113 | .01 | 10,000 |
| Tin-123 | .01 | 3,000 |
| Tin-126 | .01 | 1,000 |
| Titanium-44 | .01 | 100 |
| Vanadium-48 | .01 | 7,000 |
| Xenon-133 | 1.0 | 900,000 |
| Yttrium-91 | .01 | 2,000 |
| Zinc-65 | .01 | 5,000 |
| Zirconium-93 | .01 | 400 |

| <u>Radioactive Material</u> | <u>Release Fraction</u> | <u>Quantity (curies)</u> |
|--|-------------------------|--------------------------|
| Zirconium-95 | .01 | 5,000 |
| Any other beta-gamma emitter | .01 | 10,000 |
| Mixed fission products | .01 | 1,000 |
| Mixed corrosion products | .01 | 10,000 |
| Contaminated equipment, beta-gamma | .001 | 10,000 |
| Irradiated material, any form other than solid noncombustible | .01 | 1,000 |
| Irradiated material, solid noncombustible | .001 | 10,000 |
| Mixed radioactive waste, beta-gamma | .01 | 1,000 |
| Packaged mixed waste, beta-gamma ² | .001 | 10,000 |
| Any other alpha emitter | .001 | 2 |
| Contaminated equipment, alpha | .0001 | 20 |
| Packaged waste, alpha ² | .0001 | 20 |
| Combinations of radioactive materials listed above ¹ | — | — |

¹ For combinations of radioactive materials, consideration of the need for an emergency plan is required if the sum of the ratios of the quantity of each radioactive material authorized to the quantity listed for that material in Appendix G exceeds one.

² Waste packaged in Type B containers does not require an emergency plan.
[ARC 8982B, IAB 8/11/10, effective 9/15/10]

CHAPTER 39—APPENDIX H
CRITERIA RELATING TO USE OF FINANCIAL TESTS AND SELF-GUARANTEES FOR
PROVIDING REASONABLE ASSURANCE OF FUNDS FOR DECOMMISSIONING

I. Introduction

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the company passes the financial test of Section II of this appendix. The terms of the self-guarantee are in Section III of this appendix. This appendix establishes criteria for passing the financial test for the self-guarantee and establishes the terms for a self-guarantee.

II. Financial Test

A. To pass the financial test, a company must meet all of the following criteria:

1. Tangible net worth at least ten times the total current decommissioning cost estimate for the total of all facilities or parts thereof (or the current amount required if certification is used).
2. Assets located in the United States amounting to at least 90 percent of total assets or at least ten times the total current decommissioning cost estimate for the total of all facilities or parts thereof (or the current amount required if certification is used).
3. A current rating for its most recent bond issuance of AAA, AA, or A as issued by Standard and Poor's (S&P) or Aaa, Aa, or A as issued by Moody's.

B. To pass the financial test, a company must meet all of the following additional requirements:

1. The company must have at least one class of equity securities registered under the Securities Exchange Act of 1934.
2. The company's independent certified public accountant must have compared the data used by the company in the financial test, which is derived from the independently audited, year-end financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure, the licensee shall inform the agency within 90 days of any matters coming to the attention of the auditor that cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test.
3. After the initial financial test, the company must repeat passage of the test within 90 days after the close of each succeeding fiscal year.

C. If the licensee no longer meets the requirements of Section II.A. of this appendix, the licensee must send immediate notice to the agency of its intent to establish alternate financial assurance as specified in these rules within 120 days of such notice.

III. Company Self-Guarantee

The terms of a self-guarantee which an applicant or licensee furnishes must provide that:

A. The guarantee will remain in force unless the licensee sends notice of cancellation by certified mail, return receipt requested, to the agency. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by the agency, as evidenced by the return receipt.

B. The licensee shall provide alternative financial assurance as specified in these rules within 90 days following receipt by the agency of a notice of cancellation of the guarantee.

C. The guarantee and financial test provisions must remain in effect until the agency has terminated the license or until another financial assurance method acceptable to the agency has been put in effect by the licensee.

D. The licensee will promptly forward to the agency and the licensee's independent auditor all reports covering the latest fiscal year filed by the licensee with the Securities and Exchange Commission pursuant to the requirements of Section 13 of the Securities and Exchange Act of 1934.

E. If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of "A" or above by either Standard and Poor's or Moody's, the licensee will provide notice in writing of such fact to the agency within 20 days after publication of the change by the rating service. If the licensee's most recent bond issuance ceases to be rated in any category of "A" or above by both Standard and Poor's and Moody's, the licensee no longer meets the requirements of Section II.A. of this appendix.

F. The applicant or licensee must provide to the agency a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the agency, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.

CHAPTER 39—APPENDIX I
CRITERIA RELATING TO USE OF FINANCIAL TESTS AND SELF-GUARANTEES FOR
PROVIDING REASONABLE ASSURANCE OF FUNDS FOR DECOMMISSIONING BY
COMMERCIAL COMPANIES THAT HAVE NO OUTSTANDING RATED BONDS

I. Introduction

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the company passes the financial test of Section II of this appendix. The terms of the self-guarantee are in Section III of this appendix. This appendix establishes criteria for passing the financial test for the self-guarantee and establishes the terms for a self-guarantee.

II. Financial Test

A. To pass the financial test, a company must meet the following criteria:

1. Tangible net worth greater than \$10 million, or at least ten times the total current decommissioning cost estimate (or the current amount required if certification is used), whichever is greater, for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor.

2. Assets located in the United States amounting to at least 90 percent of total assets or at least ten times the total current decommissioning cost estimate (or the current amount required if certification is used) for all decommissioning activities for which the company is responsible as self-guaranteeing licensee and as parent-guarantor.

3. A ratio of cash flow divided by total liabilities greater than 0.15 and a ratio of total liabilities divided by net worth less than 1.5.

B. In addition, to pass the financial test, a company must meet all of the following requirements:

1. The company's independent certified public accountant must have compared the data used by the company in the financial test, which is required to be derived from the independently audited year-end financial statement based on United States generally accepted accounting practices for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure, the licensee shall inform the agency within 90 days of any matters that may cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test.

2. After the initial financial test, the company must repeat passage of the test within 90 days after the close of each succeeding fiscal year.

3. If the licensee no longer meets the requirements of Section II.A. of this appendix, the licensee must send notice to the agency of intent to establish alternative financial assurance as specified in these rules. The notice must be sent by certified mail, return receipt requested, within 90 days after the end of the fiscal year for which the year-end financial data show that the licensee no longer meets the financial test requirements. The licensee must provide alternative financial assurance within 120 days after the end of such fiscal year.

III. Company Self-Guarantee

The terms of a self-guarantee which an applicant or licensee furnishes must provide that:

A. The guarantee shall remain in force unless the licensee sends notice of cancellation by certified mail, return receipt requested, to the agency. Cancellation may not occur until an alternative financial assurance mechanism is in place.

B. The licensee shall provide alternative financial assurance as specified in the regulations within 90 days following receipt by the agency of a notice of cancellation of the guarantee.

C. The guarantee and financial test provisions must remain in effect until the agency has terminated the license or until another financial assurance method acceptable to the agency has been put in effect by the licensee.

D. The applicant or licensee must provide to the agency a written guarantee (a written commitment by a corporate officer) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the agency, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.

CHAPTER 39—APPENDIX J
CRITERIA RELATING TO USE OF FINANCIAL TESTS AND SELF-GUARANTEES FOR
PROVIDING REASONABLE ASSURANCE OF FUNDS FOR DECOMMISSIONING BY
NONPROFIT COLLEGES, UNIVERSITIES, AND HOSPITALS

I. Introduction

An applicant or licensee may provide reasonable assurance of the availability of funds for decommissioning based on furnishing its own guarantee that funds will be available for decommissioning costs and on a demonstration that the applicant or licensee passes the financial test of Section II of this appendix. The terms of the self-guarantee are in Section III of this appendix. This appendix establishes criteria for passing the financial test for the self-guarantee and establishes the terms for a self-guarantee.

II. Financial Test

A. For colleges and universities to pass the financial test, a college or university must meet either the criteria in Section II.A.1. or the criteria in Section II.A.2. of this appendix.

1. For applicants or licensees that issue bonds, a current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, or A as issued by Standard and Poor's (S&P) or Aaa, Aa, or A as issued by Moody's.

2. For applicants or licensees that do not issue bonds, unrestricted endowment consisting of assets located in the United States of at least \$50 million, or at least 30 times the total current decommissioning cost estimate (or the current amount required if certification is used), whichever is greater, for all decommissioning activities for which the college or university is responsible as a self-guaranteeing licensee.

B. For hospitals to pass the financial test, a hospital must meet either the criteria in Section II.B.1. or the criteria in Section II.B.2. of this appendix:

1. For applicants or licensees that issue bonds, a current rating for its most recent uninsured, uncollateralized, and unencumbered bond issuance of AAA, AA, or A as issued by Standard and Poor's (S&P) or Aaa, Aa, or A as issued by Moody's.

2. For applicants or licensees that do not issue bonds, all the following tests must be met:

(a) (Total revenues less total expenditures) divided by total revenues must be equal to or greater than 0.04.

(b) Long-term debt divided by net fixed assets must be less than or equal to 0.67.

(c) (Current assets and depreciation fund) divided by current liabilities must be greater than or equal to 2.55.

(d) Operating revenues must be at least 100 times the total current decommissioning cost estimate (or the current amount required if certification is used) for all decommissioning activities for which the hospital is responsible as a self-guaranteeing licensee.

C. In addition, to pass the financial test, a licensee must meet all the following requirements:

1. The licensee's independent certified public accountant must have compared the data used by the licensee in the financial test, which is required to be derived from the independently audited year-end financial statements, based on United States generally accepted accounting practices, for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure, the licensee shall inform this agency within 90 days of any matters coming to the attention of the auditor that cause the auditor to believe that the data specified in the financial test should be adjusted and that the licensee no longer passes the test.

2. After the initial financial test, the licensee must repeat passage of the test within 90 days after the close of each succeeding fiscal year.

3. If the licensee no longer meets the requirements of Section I of this appendix, the licensee must send notice to this agency of its intent to establish alternative financial assurance as specified in these rules. The notice must be sent by certified mail, return receipt requested, within 90 days after the end of the fiscal year for which the year-end financial data show that the licensee no longer meets the financial test requirements. The licensee must provide alternate financial assurance within 120 days after the end of such fiscal year.

III. Self-Guarantee

The terms of a self-guarantee which an applicant or licensee furnishes must provide that:

A. The guarantee shall remain in force unless the licensee sends notice of cancellation by certified mail, return receipt requested, to the agency. Cancellation may not occur until an alternative financial assurance mechanism is in place.

B. The licensee shall provide alternative financial assurance as specified in these rules within 90 days following receipt by the agency of a notice of cancellation of the guarantee.

C. The guarantee and financial test provisions must remain in effect until the agency has terminated the license or until another financial assurance method acceptable to the agency has been put in effect by the licensee.

D. The applicant or licensee must provide to the agency a written guarantee (a written commitment by a corporate officer or officer of the institution) which states that the licensee will fund and carry out the required decommissioning activities or, upon issuance of an order by the agency, the licensee will set up and fund a trust in the amount of the current cost estimates for decommissioning.

E. If, at any time, the licensee's most recent bond issuance ceases to be rated in any category of "A" or above by either Standard and Poor's or Moody's, the licensee shall provide notice in writing of such fact to the agency within 20 days after publication of the change by the rating service.

These rules are intended to implement Iowa Code chapter 136C.

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CHAPTER 40
STANDARDS FOR PROTECTION AGAINST RADIATION

GENERAL PROVISIONS

641—40.1(136C) Purpose and scope.

40.1(1) This chapter establishes standards for protection against ionizing radiation resulting from activities conducted pursuant to licenses or registrations issued by the agency. These rules are issued pursuant to the authority in Iowa Code section 136C.3 and 136C.4.

40.1(2) The requirements of this chapter are designed to control the receipt, possession, use, transfer, and disposal of sources of radiation by any licensee or registrant so the total dose to an individual, including doses resulting from all sources of radiation other than background radiation, does not exceed the standards for protection against radiation prescribed in this chapter. However, nothing in this chapter shall be construed as limiting actions that may be necessary to protect health and safety.

40.1(3) In addition to complying with the requirements set forth in this chapter, every reasonable effort should be made to maintain radiation exposures and releases of radioactive material in effluents to unrestricted areas as low as is reasonably achievable (ALARA). The term “as low as is reasonably achievable” means as low as is reasonably achievable taking into account the state of technology and the economics of improvements in relation to benefits to the public health and safety, other societal and socioeconomic considerations, and in relation to the utilization of ionizing radiation in the public interest.

40.1(4) Except as specifically provided in other parts of these rules, this chapter applies to persons licensed or registered by the agency to receive, possess, use, transfer, or dispose of sources of radiation. The limits in this chapter do not apply to doses due to background radiation, to exposure of patients to radiation for the purpose of medical diagnosis or therapy, or to voluntary participation in medical research programs.

40.1(5) All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

40.1(6) The provisions of Chapter 40 are in addition to, and not in substitution for, any other applicable portions of 641—Chapters 38 to 45.

[ARC 8982B, IAB 8/11/10, effective 9/15/10; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—40.2(136C) Definitions.

40.2(1) For the purposes of this chapter, the definitions of 641—Chapter 38 may also apply.

40.2(2) As used in this chapter, these terms have the definitions set forth below.

“*Annual limit on intake (ALI)*” means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference person that would result in a committed effective dose equivalent of 5 rem (0.05 Sv) or a committed dose equivalent of 50 rem (0.5 Sv) to any individual organ or tissue. ALI values for intake by ingestion and by inhalation of selected radionuclides are given in Table I, Columns 1 and 2, of Appendix B.

“*Class (or lung class or inhalation class)*” means a classification scheme for inhaled material according to its rate of clearance from the pulmonary region of the lung. Materials are classified as D, W, or Y, which applies to a range of clearance half-times: for Class D, Days, of less than 10 days, for Class W, Weeks, from 10 to 100 days, and for Class Y, Years, of greater than 100 days.

“*Declared pregnant woman*” means a woman who has voluntarily informed her licensee or registrant, in writing, of her pregnancy and the estimated date of conception. The declaration remains in effect until the declared pregnant woman withdraws the declaration in writing or is no longer pregnant.

“*Derived air concentration (DAC)*” means the concentration of a given radionuclide in air which, if breathed by the reference person for a working year of 2,000 hours under conditions of light work (inhalation rate 1.2 cubic meters of air per hour) results in an intake of one ALI. DAC values are given in Table I, Column 3, of Appendix B.

“Derived air concentration-hour (DAC-hour)” means the product of the concentration of radioactive material in air, expressed as a fraction or multiple of the derived air concentration for each radionuclide, and the time of exposure to that radionuclide, in hours. A licensee or registrant may take 2,000 DAC-hours to represent one ALI, equivalent to a committed dose equivalent of 5 rem (0.05 Sv).

“Dosimetry processor” means an individual or an organization that processes and evaluates individual monitoring devices in order to determine the radiation dose delivered to the monitoring devices.

“Inhalation class” (see “Class.”)

“Lung class” (see “Class.”)

“National tracked source” means a sealed source containing a quantity equal to or greater than Category 1 or Category 2 levels of any radioactive material listed in Appendix H of this chapter. In this context a “sealed source” is defined as radioactive material that is sealed in a capsule or closely bonded in a solid form and that is not exempt from regulatory control. It does not mean material encapsulated solely for disposal, or nuclear material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet. Category 1 nationally tracked sources are those containing radioactive material at a quantity equal to or greater than the Category 1 threshold. Category 2 nationally tracked sources are those containing radioactive material at a quantity equal to or greater than the Category 2 threshold but less than the Category 1 threshold.

“Nonstochastic effect” means a health effect, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation-induced cataract formation is an example of a nonstochastic effect. For purposes of these rules, “deterministic effect” is an equivalent term.

“Planned special exposure” means an infrequent exposure to radiation, separate from and in addition to the annual occupational dose limits.

“Quarter” means a period of time equal to one-fourth of the year observed by the licensee, approximately 13 consecutive weeks, providing that the beginning of the first quarter in a year coincides with the starting date of the year and that no day is omitted or duplicated in consecutive quarters.

“Reference person” means a hypothetical aggregation of human physical and physiological characteristics determined by international consensus. These characteristics may be used by researchers and public health workers to standardize results of experiments and to relate biological insult to a common base. A description of the reference person is contained in the International Commission on Radiological Protection report, ICRP Publication 23, “Report of the Task Group on Reference Man.”

“Respiratory protective equipment” means an apparatus, such as a respirator, used to reduce an individual’s intake of airborne radioactive materials.

“Sanitary sewerage” means a system of public sewers for carrying off wastewater and refuse, but excluding sewage treatment facilities, septic tanks, and leach fields owned or operated by the licensee or registrant.

“Stochastic effect” means a health effect that occurs randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects. For purposes of these rules, “probabilistic effect” is an equivalent term.

“Weighting factor” w_T for an organ or tissue (T) means the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of w_T are:

| ORGAN DOSE WEIGHTING FACTORS | |
|------------------------------|-------------------|
| Organ or Tissue | w_T |
| Gonads | 0.25 |
| Breast | 0.15 |
| Red bone marrow | 0.12 |
| Lung | 0.12 |
| Thyroid | 0.03 |
| Bone surfaces | 0.03 |
| Remainder | 0.30 ^a |
| Whole Body | 1.00 ^b |

^a0.30 results from 0.06 for each of 5 “remainder” organs, excluding the skin and the lens of the eye, that receive the highest doses.

^bFor the purpose of weighting the external whole body dose, for adding it to the internal dose, a single weighting factor, $w_T = 1.0$, has been specified. The use of other weighting factors for external exposure will be approved on a case-by-case basis until such time as specific guidance is issued.

641—40.3(136C) Implementation.

40.3(1) Any existing license or registration condition that is more restrictive than this chapter remains in force until there is an amendment or renewal of the license or registration.

40.3(2) If a license or registration condition exempts a licensee or registrant from a provision of this chapter in effect on or before January 1, 1994, it also exempts the licensee or registrant from the corresponding provision of this chapter.

40.3(3) If a license or registration condition cites provisions of this chapter in effect prior to January 1, 1994, which do not correspond to any provisions of this chapter, the license or registration condition remains in force until there is an amendment or renewal of the license or registration that modifies or removes this condition.

641—40.4 to 40.9 Reserved.

RADIATION PROTECTION PROGRAMS

641—40.10(136C) Radiation protection programs.

40.10(1) Each licensee or registrant shall develop, document, and implement a radiation protection program sufficient to ensure compliance with the provisions of this chapter. See 40.81(136C) for record-keeping requirements relating to these programs.

40.10(2) The licensee or registrant shall use, to the extent practical, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as is reasonably achievable (ALARA).

40.10(3) The licensee or registrant shall, at intervals not to exceed 12 months, review the radiation protection program content and implementation.

40.10(4) To implement the ALARA requirements of 40.10(2), and notwithstanding the requirements in 641—40.26(136C), a constraint on air emissions of radioactive material to the environment, excluding radon-222 and its daughters, shall be established by licensees such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent in excess of 10 mrem (0.1 mSv) per year from these emissions. If a licensee subject to this requirement exceeds this dose constraint, the licensee shall report the exceedance as provided in 641—40.97(136C) and promptly take appropriate corrective action to ensure against recurrence.

641—40.11 to 40.14 Reserved.

OCCUPATIONAL DOSE LIMITS

641—40.15(136C) Occupational dose limits for adults.

40.15(1) The licensee or registrant shall control the occupational dose to individual adults, except for planned special exposures pursuant to 40.20(136C), to the following dose limits:

a. An annual limit, which is the more limiting of:

- (1) The total effective dose equivalent being equal to 5 rem (0.05 Sv); or
- (2) The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rem (0.5 Sv).

b. The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities which are:

- (1) A lens dose equivalent of 15 rem (0.15 Sv), and
- (2) A shallow dose equivalent of 50 rem (0.5 Sv) to the skin of the whole body or to the skin of any extremity.

40.15(2) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, shall be subtracted from the limits for planned special exposures that the individual may receive during the current year and during the individual's lifetime. See 40.20(5) "a" and "b."

40.15(3) When the external exposure is determined by measurement with an external personal monitoring device, the deep dose equivalent must be used in place of the effective dose equivalent, unless the effective dose equivalent is determined by a dosimetry method approved by the agency. The assigned deep dose equivalent must be for the part of the body receiving the highest exposure. The assigned shallow dose equivalent must be the dose averaged over the contiguous 10 square centimeters of skin receiving the highest exposure. The deep dose equivalent, lens dose equivalent, and shallow dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable.

40.15(4) Derived air concentration (DAC) and annual limit on intake (ALI) values are presented in Table I of Appendix B and may be used to determine the individual's dose and to demonstrate compliance with the occupational dose limits. See 40.86(136C).

40.15(5) Notwithstanding the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity. See footnote 3 of Appendix B.

40.15(6) The licensee or registrant shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person. See 40.19(5).

[ARC 8982B, IAB 8/11/10, effective 9/15/10]

641—40.16(136C) Compliance with requirements for summation of external and internal doses.

40.16(1) If the licensee or registrant is required to monitor pursuant to both 40.19(1) and 40.19(2), the licensee or registrant shall demonstrate compliance with the dose limits by summing external and internal doses. If the licensee or registrant is required to monitor only pursuant to 40.19(1), or only pursuant to 40.19(2), then summation is not required to demonstrate compliance with the dose limits. The licensee or registrant may demonstrate compliance with the requirements for summation of external and internal doses pursuant to 40.16(2), 40.16(3) and 40.16(4). The dose equivalents for the lens of the eye, the skin, and the extremities are not included in the summation, but are subject to separate limits.

40.16(2) Intake by inhalation. If the only intake of radionuclides is by inhalation, the total effective dose equivalent limit is not exceeded if the sum of the deep dose equivalent divided by the total effective dose equivalent limit, and one of the following, does not exceed unity:

a. The sum of the fractions of the inhalation ALI for each radionuclide, or

b. The total number of derived air concentration-hours (DAC-hours) for all radionuclides divided by 2,000, or

c. The sum of the calculated committed effective dose equivalents to all significantly irradiated organs or tissues (T) calculated from bioassay data using appropriate biological models and expressed as a fraction of the annual limit. For purposes of this requirement, an organ or tissue is deemed to be significantly irradiated if, for that organ or tissue, the product of the weighting factors, w_T , and the committed dose equivalent, $H_{T,50}$, per unit intake is greater than 10 percent of the maximum weighted value of H_{50} , that is, $w_T H_{T,50}$, per unit intake for any organ or tissue.

40.16(3) Intake by oral ingestion. If the occupationally exposed individual also receives an intake of radionuclides by oral ingestion greater than 10 percent of the applicable oral ALI, the licensee shall account for this intake and include it in demonstrating compliance with the limits.

40.16(4) Intake through wounds or absorption through skin. The licensee shall evaluate and, to the extent practical, account for intakes through wounds or skin absorption. The intake through intact skin has been included in the calculation of DAC for hydrogen-3 and does not need to be evaluated or accounted for pursuant to this subrule.

641—40.17(136C) Determination of external dose from airborne radioactive material.

40.17(1) Licensees shall, when determining the dose from airborne radioactive material, include the contribution to the deep dose equivalent, lens dose equivalent, and shallow dose equivalent from external exposure to the radioactive cloud. See Appendix B, footnotes 1 and 2.

40.17(2) Airborne radioactivity measurements and DAC values shall not be used as the primary means to assess the deep dose equivalent when the airborne radioactive material includes radionuclides other than noble gases or if the cloud of airborne radioactive material is not relatively uniform. The determination of the deep dose equivalent to an individual shall be based upon measurements using instruments or individual monitoring devices.

641—40.18(136C) Determination of internal exposure.

40.18(1) For purposes of assessing dose used to determine compliance with occupational dose equivalent limits, the licensee shall, when required pursuant to 40.37(136C), take suitable and timely measurements of:

- a. Concentrations of radioactive materials in air in work areas; or
- b. Quantities of radionuclides in the body; or
- c. Quantities of radionuclides excreted from the body; or
- d. Combinations of these measurements.

40.18(2) Unless respiratory protective equipment is used, as provided in 40.50(136C), or the assessment of intake is based on bioassays, the licensee shall assume that an individual inhales radioactive material at the airborne concentration in which the individual is present.

40.18(3) When specific information on the physical and biochemical properties of the radionuclides taken into the body or the behavior of the material in an individual is known, the licensee may:

- a. Use that information to calculate the committed effective dose equivalent, and, if used, the licensee shall document that information in the individual's record; and
- b. Upon prior approval of the agency, adjust the DAC or ALI values to reflect the actual physical and chemical characteristics of airborne radioactive material, for example, aerosol size distribution or density; and
- c. Separately assess the contribution of fractional intakes of Class D, W, or Y compounds of a given radionuclide to the committed effective dose equivalent. See Appendix B.

40.18(4) If the licensee chooses to assess intakes of Class Y material using the measurements given in 40.8(1) "b" or 40.8(1) "c," the licensee may delay the recording and reporting of the assessments for periods up to seven months, unless otherwise required by 40.96(136C) or 40.97(136C). This delay permits the licensee to make additional measurements basic to the assessments.

40.18(5) If the identity and concentration of each radionuclide in a mixture are known, the fraction of the DAC applicable to the mixture for use in calculating DAC-hours shall be either:

- a. The sum of the ratios of the concentration to the appropriate DAC value, that is, D, W, or Y, from Appendix B for each radionuclide in the mixture; or

b. The ratio of the total concentration for all radionuclides in the mixture to the most restrictive DAC value for any radionuclide in the mixture.

40.18(6) If the identity of each radionuclide in a mixture is known, but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.

40.18(7) When a mixture of radionuclides in air exists, a licensee may disregard certain radionuclides in the mixture if:

a. The licensee uses the total activity of the mixture in demonstrating compliance with the dose limits in 40.15(136C) and in complying with the monitoring requirements in 40.37(136C), and

b. The concentration of any radionuclide disregarded is less than 10 percent of its DAC, and

c. The sum of these percentages for all of the radionuclides disregarded in the mixture does not exceed 30 percent.

40.18(8) When determining the committed effective dose equivalent, the following information may be considered:

a. In order to calculate the committed effective dose equivalent, the licensee or registrant may assume that the inhalation of one ALI, or an exposure of 2,000 DAC-hours, results in a committed effective dose equivalent of 5 rem (0.05 Sv) for radionuclides that have their ALIs or DACs based on the committed effective dose equivalent.

b. For an ALI and the associated DAC determined by the nonstochastic organ dose limit of 50 rem (0.5 Sv), the intake of radionuclides that would result in a committed effective dose equivalent of 5 rem (0.05 Sv), that is, the stochastic ALI, is listed in parentheses in Table I of Appendix B. The licensee or registrant may, as a simplifying assumption, use the stochastic ALI to determine committed effective dose equivalent. However, if the licensee or registrant uses the stochastic ALI, the licensee or registrant shall also demonstrate that the limit in 40.15(1) "a"(2) is met.

641—40.19(136C) Determination of prior occupational dose.

40.19(1) For each individual who is likely to receive, in a year, an occupational dose requiring monitoring pursuant to this rule, the licensee or registrant shall:

a. Determine the occupational radiation dose received during the current year; and

b. Attempt to obtain the records of lifetime cumulative occupational radiation dose.

40.19(2) Prior to permitting an individual to participate in a planned special exposure, the licensee or registrant shall determine:

a. The internal and external doses from all previous planned special exposures; and

b. All doses in excess of the limits, including doses received during accidents and emergencies, received during the lifetime of the individual; and

c. All lifetime cumulative occupational radiation dose.

40.19(3) In complying with the requirements of 40.19(1), a licensee or registrant may:

a. Accept, as a record of the occupational dose that the individual received during the current year, a written signed statement from the individual, or from the individual's most recent employer for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year; and

b. Accept, as the record of lifetime cumulative radiation dose, a form signed by the individual and countersigned by an appropriate official of the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant; and

c. Obtain reports of the individual's dose equivalent from the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant, by telephone, telegram, facsimile, or letter. The licensee or registrant shall request a written verification of the dose data if the authenticity of the transmitted report cannot be established.

40.19(4) *a.* The licensee or registrant shall record the exposure history, as required by 40.37(136C). The form or record shall show each period in which the individual received occupational exposure to

radiation or radioactive material and shall be signed by the individual who received the exposure. For each period for which the licensee or registrant obtains reports, the licensee or registrant shall use the dose shown in the report in preparing the exposure history. For any period in which the licensee or registrant does not obtain a report, the licensee or registrant shall place a notation on the report indicating the periods of time for which data are not available.

b. Licensees or registrants are not required to reevaluate the separate external dose equivalents and internal committed dose equivalents or intakes of radionuclides assessed pursuant to the rules in this chapter in effect on or before January 1, 1994. Further, occupational exposure histories obtained and recorded on or before January 1, 1994, would not have included effective dose equivalent, but may be used in the absence of specific information on the intake of radionuclides by the individual.

40.19(5) If the licensee or registrant is unable to obtain a complete record of an individual's current and previously accumulated occupational dose, the licensee or registrant shall assume:

a. In establishing administrative controls pursuant to 40.15(6) for the current year, that the allowable dose limit for the individual is reduced by 1.25 rem (12.5 mSv) for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure; and

b. That the individual is not available for planned special exposures.

40.19(6) The licensee or registrant shall retain the records in 641—40.19(136C) until the agency terminates each pertinent license or registration requiring this record. The licensee or registrant shall retain records used in preparing any record for this subrule for three years after the record is made.

641—40.20(136C) Planned special exposures. A licensee or registrant may authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in 40.15(136C) provided that each of the following conditions is satisfied:

40.20(1) The licensee or registrant authorizes a planned special exposure only in an exceptional situation when alternatives that might avoid the dose estimated to result from the planned special exposure are unavailable or impractical.

40.20(2) The licensee or registrant, and employer if the employer is not the licensee or registrant, specifically authorizes the planned special exposure, in writing, before the exposure occurs.

40.20(3) Before a planned special exposure, the licensee or registrant ensures that each individual involved is:

a. Informed of the purpose of the planned operation; and

b. Informed of the estimated doses and associated potential risks and specific radiation levels or other conditions that might be involved in performing the task; and

c. Instructed in the measures to be taken to keep the dose ALARA considering other risks that may be present.

40.20(4) Prior to permitting an individual to participate in a planned special exposure, the licensee or registrant ascertains prior doses as required by 40.19(2) during the lifetime of the individual for each individual involved.

40.20(5) Subject to 40.15(2), the licensee or registrant shall not authorize a planned special exposure that would cause an individual to receive a dose from all planned special exposures and all doses in excess of the limits to exceed:

a. The numerical values of any of the dose limits in 40.15(1) in any year; and

b. Five times the annual dose limits in 40.15(1) during the individual's lifetime.

40.20(6) The licensee or registrant maintains records of the conduct of a planned special exposure in accordance with 40.85(136C) and submits a written report in accordance with 40.98(136C).

40.20(7) The licensee or registrant records the best estimate of the dose resulting from the planned special exposure in the individual's record and informs the individual, in writing, of the dose within 30 days from the date of the planned special exposure. The dose from planned special exposures shall not be considered in controlling future occupational dose of the individual pursuant to 40.15(1) but shall be included in evaluations required by 40.20(1) and 40.20(2).

641—40.21(136C) Occupational dose limits for minors. The annual occupational dose limits for minors are 10 percent of the annual dose limits specified for adult workers in 40.15(136C).

641—40.22(136C) Dose equivalent to an embryo/fetus.

40.22(1) The licensee or registrant shall ensure that the dose equivalent to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed 0.5 rem (5 mSv). See 40.86(136C) for record-keeping requirements.

40.22(2) The licensee or registrant shall make efforts to avoid substantial variation¹ above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in 40.22(1).

40.22(3) The dose equivalent to an embryo/fetus shall be taken as the sum of:

- a. The deep dose equivalent to the declared pregnant woman; and
- b. The dose equivalent to the embryo/fetus from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

40.22(4) If by the time the woman declares pregnancy to the licensee or registrant, the dose equivalent to the embryo/fetus has exceeded 0.5 rem (5 mSv), or is within 0.05 rem (0.5 mSv) of this dose, the licensee or registrant shall be deemed to be in compliance with 40.22(1) if the additional dose equivalent to the embryo/fetus does not exceed 0.05 rem (0.5 mSv) during the remainder of the pregnancy.

¹ The National Council on Radiation Protection and Measurements recommended in NCRP Report No. 91 "Recommendations on Limits for Exposure to Ionizing Radiation" (June 1, 1987) that no more than 0.05 rem (0.5 mSv) to the embryo/fetus be received in any one month.

641—40.23 to 40.25 Reserved.

RADIATION DOSE LIMITS FOR INDIVIDUAL MEMBERS OF THE PUBLIC

641—40.26(136C) Dose limits for individual members of the public.

40.26(1) Each licensee or registrant shall conduct operations so that:

a. The total effective dose equivalent to individual members of the public from the licensed or registered operation does not exceed 0.1 rem (1 millisievert) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with 641—subrule 41.2(27), from voluntary participation in medical research programs, and from the licensee's or registrant's disposal of radioactive material into sanitary sewerage under 641—40.72(136C); and

b. The dose in any unrestricted area from external sources, exclusive of the dose contributions from patients administered radioactive material and released under 641—subrule 41.2(27), does not exceed 0.002 rem (0.02 millisievert) in any one hour.

40.26(2) If the licensee or registrant permits members of the public to have access to controlled areas, the limits for members of the public continue to apply to those individuals.

40.26(3) A licensee, registrant, or an applicant for a license or registration may apply for prior agency authorization to operate up to an annual dose limit for an individual member of the public of 0.5 rem (5 mSv). This application shall include the following information:

a. Demonstration of the need for and the expected duration of operations in excess of the limit in 40.26(1); and

b. The licensee's or registrant's program to assess and control dose within the 0.5 rem (5 mSv) annual limit; and

c. The procedures to be followed to maintain the dose ALARA.

40.26(4) In addition to the requirements of this chapter, a licensee or registrant subject to the provisions of the U.S. Environmental Protection Agency's generally applicable environmental radiation standards in 40 CFR 190 shall comply with those standards.

40.26(5) The agency may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a licensee or registrant may release in effluents in order to restrict the collective dose.

40.26(6) Notwithstanding the requirements of 40.26(1) “a,” a licensee may permit visitors to an individual who cannot be released under 641—subrule 41.2(27) to receive a radiation dose greater than 0.1 rem (1 mSv) if:

- a. The radiation dose received does not exceed 0.5 rem (5 mSv); and
- b. The authorized user, as defined in 641—subrule 41.2(2), has determined before the visit that it is appropriate.

641—40.27(136C) Compliance with dose limits for individual members of the public.

40.27(1) The licensee or registrant shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in 40.26(136C).

40.27(2) A licensee or registrant shall show compliance with the annual dose limit in 40.26(136C) by:

a. Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed or registered operation does not exceed the annual dose limit; or

b. Demonstrating that:

(1) The annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in Table II of Appendix B; and

(2) If an individual were continually present in an unrestricted area, the dose from external sources would not exceed 0.002 rem (0.02 mSv) in an hour and 0.05 rem (0.5 mSv) in a year.

40.27(3) Upon approval from the agency, the licensee or registrant may adjust the effluent concentration values in Appendix B, Table II, for members of the public, to take into account the actual physical and chemical characteristics of the effluents, such as aerosol size distribution, solubility, density, radioactive decay equilibrium, and chemical form.

RADIOLOGICAL CRITERIA FOR LICENSE TERMINATION

641—40.28(136C) Radiological criteria for license termination.

40.28(1) The criteria in this rule apply to the decommissioning of facilities licensed under 641—Chapter 39, and to the release of part of a facility or site for unrestricted use, as well as other facilities subject to the agency’s jurisdiction under Iowa Code chapter 136C.

40.28(2) The criteria in this rule do not apply to sites which:

a. Have been decommissioned prior to July 1, 1999, in accordance with criteria identified in 641—subrule 39.4(33).

b. Have previously submitted and received agency approval on a license termination plan (LTP) or decommissioning plan that is compatible with the United States Nuclear Regulatory Commission (NRC) Site Decommissioning Management Plan (SDMP) Action Plan criteria; or

c. Submit a sufficient LTP or decommissioning plan prior to July 1, 1999, and such LTP or decommissioning plan is approved by the agency prior to July 1, 1999, except that if an environmental impact statement is required in the submittal, there will be a provision for day-to-day extension.

40.28(3) After a site has been decommissioned and the license terminated in accordance with the criteria in this chapter, or after part of a facility or site has been released for unrestricted use in accordance with this chapter, the agency will require additional cleanup only if, based on new information, it determines that the criteria of this chapter were not met and residual radioactivity remaining at the site could result in significant threat to public health and safety.

40.28(4) When calculating TEDE to the average member of the critical group the licensee shall determine the peak annual TEDE dose expected within the first 1000 years after decommissioning.

40.28(5) Public notification and public participation. Upon the receipt of an LTP or decommissioning plan from the licensee or a proposal by the licensee for release of a site pursuant to 40.30(136C) or 40.31(136C) or whenever the agency deems such notice to be in the public interest, the agency shall:

a. Notify and solicit comments from:

(1) Local and state governments in the vicinity of the site and any Indian nation or other indigenous people that have treaty or statutory rights that could be affected by the decommissioning; and

(2) The Environmental Protection Agency for cases where the licensee proposes to release a site pursuant to 40.31(136C).

b. Publish a notice in the Iowa Administrative Bulletin and in a forum, such as local newspapers, letters to state or local organizations, or other appropriate forum, that is readily accessible to individuals in the vicinity of the site, and solicit comments from affected parties.

40.28(6) Minimization of contamination. Applicants for licenses, other than renewals, after July 1, 1999, shall describe in the application how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste. Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in 641—40.10(136C) and radiological criteria for license termination in 40.28(1) through 40.28(5).

[ARC 1639C, IAB 10/1/14, effective 11/5/14]

641—40.29(136C) Radiological criteria for unrestricted use. A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.

641—40.30(136C) Criteria for license termination under restricted conditions. A site will be considered acceptable for license termination under restricted conditions if:

40.30(1) The licensee can demonstrate that reductions in residual radioactivity necessary to comply with the provisions of 40.29(136C) would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA. Determination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal;

40.30(2) The licensee has made provisions for legally enforceable institutional controls that provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year;

40.30(3) The licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site. Acceptable financial assurance mechanisms are:

a. Funds placed into a trust segregated from the licensee's assets and outside the licensee's administrative control and in which the adequacy of the trust funds is to be assessed based on an assumed annual 1 percent real rate of return on investment;

b. Rescinded IAB 10/1/14, effective 11/5/14.

c. A statement of intent in the case of federal, state, or local government licensees, as described in 641—subparagraph 39.4(26) “f”(4); or

d. When a governmental entity is assuming custody and ownership of a site, an arrangement that is deemed acceptable by such governmental entity.

40.30(4) The licensee has submitted a decommissioning plan or license termination plan (LTP) to the agency indicating the licensee's intent to decommission in accordance with 641—paragraph 39.4(33) "*d*" and specifying that the licensee intends to decommission by restricting use of the site. The licensee shall document in the LTP or decommissioning plan how the advice of individuals and institutions in the community, who may be affected by the decommissioning, has been sought and incorporated, as appropriate, following analysis of that advice. Licensees proposing to decommission by restricting use of the site shall seek advice from such affected parties regarding the following matters concerning the proposed decommissioning:

a. Whether provisions for institutional controls proposed by the licensee:

(1) Will provide reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group will not exceed 25 mrem (0.25 mSv) per year;

(2) Will be enforceable; and

(3) Will not impose undue burdens on the local community or other affected parties.

b. Whether the licensee has provided sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site;

c. In seeking advice on the issues identified in 40.30(4) "*a*," the licensee shall provide for:

(1) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(2) An opportunity for a comprehensive, collective discussion of the issues by the participants represented; and

(3) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues; and

40.30(5) Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either:

a. 100 mrem (1 mSv) per year; or

b. 500 mrem (5 mSv) per year provided the licensee:

(1) Demonstrates that further reductions in residual radioactivity necessary to comply with the 100 mrem/yr (1 mSv/yr) value of 40.30(5) "*a*" are not technically achievable, would be prohibitively expensive, or would result in net public or environmental harm;

(2) Makes provisions for durable institutional controls; and

(3) Provides sufficient financial assurance to enable a responsible government entity or independent third party, including a governmental custodian of a site, both to carry out periodic rechecks of the site no less frequently than every five years to ensure that the institutional controls remain in place as necessary to meet the criteria of 40.30(2) and to assume and carry out responsibilities for any necessary controls and maintenance of those controls. Acceptable financial assurance mechanisms are those in subrule 40.30(3).

[ARC 1639C, IAB 10/1/14, effective 11/5/14]

641—40.31(136C) Alternate criteria for license termination.

40.31(1) The agency may terminate a license using alternate criteria greater than the dose criterion of 641—40.29(136C), 40.30(2) and 40.30(4) "*a*"(1) if the licensee:

a. Provides assurance that public health and safety would continue to be protected and that it is unlikely that the dose from all man-made sources combined, other than medical, would be more than the 100 mrem/yr (1 mSv/yr) by submitting an analysis of possible sources of exposure;

b. Has employed, to the extent practical, restrictions on site use according to the provisions of 641—40.30(136C) in minimizing exposures at the site;

c. Reduces doses to ALARA levels taking into consideration any detriments such as traffic accidents expected to potentially result from decontamination and waste disposal;

d. Has submitted a decommissioning plan or license termination plan (LTP) to the agency indicating the licensee's intent to decommission in accordance with 641—paragraph 39.4(33)“*d*,” and specifying that the licensee proposes to decommission by use of alternate criteria. The licensee shall document in the decommissioning plan or LTP how the advice of individuals and institutions in the community, who may be affected by the decommissioning, has been sought and addressed, as appropriate, following analysis of that advice. In seeking such advice, the licensee shall provide for:

(1) Participation by representatives of a broad cross section of community interests who may be affected by the decommissioning;

(2) An opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(3) A publicly available summary of the results of all such discussions, including a description of the individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants on the issues; and

e. Has provided sufficient financial assurance in the form of a trust fund to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site.

40.31(2) The use of alternate criteria to terminate a license requires the approval of the agency after consideration of the staff's recommendations that will address any comments provided by the Environmental Protection Agency and any public comments submitted pursuant to 40.32(136C).

[ARC 1639C, IAB 10/1/14, effective 11/5/14]

TESTING FOR LEAKAGE OR CONTAMINATION OF SEALED SOURCES

641—40.32(136C) Testing for leakage or contamination of sealed sources.

40.32(1) The licensee in possession of any sealed source shall ensure that:

a. Each sealed source, except as specified in 40.32(2), is tested for leakage or contamination and the test results are received before the sealed source is put into use unless the licensee has a certificate from the transferor indicating that the sealed source was tested within six months before transfer to the licensee.

b. Each sealed source that is not designed to emit alpha particles is tested for leakage or contamination at intervals not to exceed six months or at alternative intervals approved by the agency, after evaluation of information specified by 641—subparagraphs 39.4(29)“*l*”(2) and 39.4(29)“*l*”(3) of these rules, an agreement state, a licensing state, or the U.S. Nuclear Regulatory Commission.

c. Each sealed source that is designed to emit alpha particles is tested for leakage or contamination at intervals not to exceed three months or at alternative intervals approved by the agency, after evaluation of information specified by 641—subparagraphs 39.4(29)“*l*”(2) and 39.4(29)“*l*”(3) of these rules, an agreement state, a licensing state, or the Nuclear Regulatory Commission.

d. For each sealed source that is required to be tested for leakage or contamination, at any other time there is reason to suspect that the sealed source might have been damaged or might be leaking, the licensee or registrant shall ensure that the sealed source is tested for leakage or contamination before further use.

e. Tests for leakage for all sealed sources, except brachytherapy sources manufactured to contain radium, shall be capable of detecting the presence of 0.005 μCi (185 Bq) of radioactive material on a test sample. Test samples shall be taken from the sealed source or from the surfaces of the container in which the sealed source is stored or mounted on which one might expect contamination to accumulate. For a sealed source contained in a device, test samples are obtained when the source is in the “off” position.

f. The test for leakage for brachytherapy sources manufactured to contain radium shall be capable of detecting an absolute leakage rate of 0.001 μCi (37 Bq) of radon-222 in a 24-hour period when the

collection efficiency for radon-222 and its daughters has been determined with respect to collection method, volume and time.

g. Tests for contamination from radium daughters shall be taken on the interior surface of brachytherapy source storage containers and shall be capable of detecting the presence of 0.005 μCi (185 Bq) of a radium daughter which has a half-life greater than four days.

40.32(2) A licensee need not perform tests for leakage or contamination on the following sealed sources:

- a.* Sealed sources containing only radioactive material with a half-life of less than 30 days;
- b.* Sealed sources containing only radioactive material as a gas;
- c.* Sealed sources containing 100 μCi (3.7 MBq) or less of beta- or photon-emitting material or 10 μCi (370 kBq) or less of alpha-emitting material;
- d.* Sealed sources containing only hydrogen-3;
- e.* Seeds of iridium-192 encased in nylon ribbon; and
- f.* Sealed sources, except those used in teletherapy and brachytherapy and those containing radium, which are stored, not being used and identified as in storage. The licensee shall, however, test each such sealed source for leakage or contamination and receive the test results before any use or transfer unless it has been tested for leakage or contamination within six months before the date of use or transfer.

40.32(3) Tests for leakage or contamination from sealed sources shall be performed by persons specifically authorized by the agency, an agreement state, a licensing state, or the U.S. Nuclear Regulatory Commission to perform such services.

40.32(4) Test results shall be kept in units of microcurie or becquerel and maintained for inspection by the agency.

40.32(5) The following shall be considered evidence that a sealed source is leaking:

- a.* The presence of 0.005 μCi (185 Bq) or more of removable contamination on any test sample.
- b.* Leakage of 0.001 μCi (37 Bq) of radon-222 per 24 hours for brachytherapy sources manufactured to contain radium.
- c.* The presence of removable contamination resulting from the decay of 0.005 μCi (185 Bq) or more of radium.

40.32(6) The licensee shall immediately withdraw a leaking sealed source from use and shall take action to prevent the spread of contamination. The leaking sealed source shall be repaired or disposed of in accordance with this chapter.

40.32(7) Reports of test results for leaking or contaminated sealed sources shall be made pursuant to 40.102(136C).

[ARC 1639C, IAB 10/1/14, effective 11/5/14]

641—40.33 to 40.35 Reserved.

SURVEYS AND MONITORING

641—40.36(136C) Surveys and monitoring—general.

40.36(1) Each licensee or registrant shall make, or cause to be made, surveys of areas, including the subsurface, that:

- a.* Are necessary for the licensee or registrant to comply with this chapter; and
- b.* Are necessary under the circumstances to evaluate:
 - (1) The magnitude and extent of radiation levels; and
 - (2) Concentrations or quantities of residual radioactivity; and
 - (3) The potential radiological hazards of the radiation levels and residual radioactivity detected.

40.36(2) Notwithstanding 641—40.82(136C), records from surveys describing the location and amount of subsurface residual radioactivity identified at the site must be kept with records important for decommissioning, and such records must be retained in accordance with 641—subrule 39.4(26) as applicable.

40.36(3) The licensee or registrant shall ensure that instruments and equipment used for quantitative radiation measurements, for example, dose rate and effluent monitoring, are calibrated at intervals not to exceed 12 months for the radiation measured except when a more frequent interval is specified in another applicable part of these rules or a license condition.

40.36(4) All personnel dosimeters, except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to any extremity, that require processing to determine the radiation dose and that are used by licensees and registrants to comply with 40.15(136C), with other applicable provisions of these rules, or with conditions specified in a license or registration shall be processed and evaluated by a dosimetry processor:

a. Holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and

b. Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

40.36(5) The licensee or registrant shall ensure that adequate precautions are taken to prevent a deceptive exposure of an individual monitoring device.

40.36(6) After replacement, each personnel dosimeter must be sent for processing as soon as possible.

[ARC 1639C, IAB 10/1/14, effective 11/5/14]

641—40.37(136C) Conditions requiring individual monitoring of external and internal occupational dose. Each licensee or registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the occupational dose limits of this chapter. As a minimum:

40.37(1) Each licensee or registrant shall monitor occupational exposure to radiation and shall supply and require the use of individual monitoring devices by:

a. Adults likely to receive, in 1 year from sources external to the body, a dose in excess of 10 percent of the limits in 40.15(1);

b. Minors likely to receive, in 1 year from sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv), a lens dose equivalent in excess of 0.15 rem (1.5 mSv), or a shallow dose equivalent to the skin or to the extremities in excess of 0.5 rem (5 mSv);

c. Individuals entering a high or very high radiation area;

d. Individuals working with medical fluoroscopic equipment; and

e. Declared pregnant women likely to receive during the entire pregnancy, from radiation sources external to the body, a deep dose equivalent in excess of 0.1 rem (1 mSv).

40.37(2) Each licensee or registrant shall monitor, to determine compliance with 40.18(136C), the occupational intake of radioactive material by and assess the committed effective dose equivalent to:

a. Adults likely to receive, in 1 year, an intake in excess of 10 percent of the applicable ALI in Table I, Columns 1 and 2, of Appendix B;

b. Minors likely to receive, in 1 year, a committed effective dose equivalent in excess of 0.1 rem (1 mSv); and

c. Declared pregnant women likely to receive, during the entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem (1 mSv).

40.37(3) Location of individual monitoring devices. Each licensee or registrant shall ensure that individuals who are required to monitor occupational doses in accordance with 40.37(136C) wear individual monitoring devices as follows:

a. An individual monitoring device used for monitoring the dose to the whole body shall be worn at the unshielded portion of the whole body likely to receive the highest exposure. When a protective apron is worn, the location of the individual monitoring device shall be near the midline of the body, under the apron;

b. An individual monitoring device used for monitoring the dose to an embryo/fetus of a declared pregnant woman shall be located at the waist under any protective apron being worn by the woman;

c. An individual monitoring device used for monitoring the eye dose equivalent, to demonstrate compliance with 40.15(136C) shall be located at the neck (collar), outside any protective apron being worn by the monitored individual, or at an unshielded location closer to the eye;

d. An individual monitoring device used for monitoring the dose to the extremities, to demonstrate compliance with 40.15(136C), shall be worn on the extremity likely to receive the highest exposure. Each individual monitoring device shall be oriented to measure the highest dose to the extremity being monitored.

[ARC 1639C, IAB 10/1/14, effective 11/5/14]

641—40.38 to 40.41 Reserved.

CONTROL OF EXPOSURE FROM EXTERNAL SOURCES IN RESTRICTED AREAS

641—40.42(136C) Control of access to high radiation areas.

40.42(1) The licensee or registrant shall ensure that each entrance or access point to a high radiation area has one or more of the following features:

a. A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a deep dose equivalent of 0.1 rem (1 mSv) in 1 hour at 30 centimeters from the source of radiation from any surface that the radiation penetrates; or

b. A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

c. Entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

40.42(2) In place of the controls required by 40.42(1) for a high radiation area, the licensee or registrant may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

40.42(3) The licensee or registrant may apply to the agency for approval of alternative methods for controlling access to high radiation areas.

40.42(4) The licensee or registrant shall establish the controls required by 40.42(1) and 40.42(3) in a way that does not prevent individuals from leaving a high radiation area.

40.42(5) The licensee is not required to control each entrance or access point to a room or other area that is a high radiation area solely because of the presence of radioactive materials prepared for transport and packaged and labeled in accordance with the rules of the U.S. Department of Transportation provided that:

a. The packages do not remain in the area longer than three days; and

b. The dose rate at 1 meter from the external surface of any package does not exceed 0.01 rem (0.1 mSv) per hour.

40.42(6) The licensee is not required to control entrance or access to rooms or other areas in hospitals solely because of the presence of patients containing radioactive material, provided that there are personnel in attendance who are taking the necessary precautions to prevent the exposure of individuals to radiation or radioactive material in excess of the established limits in this chapter and to operate within the ALARA provisions of the licensee's radiation protection program.

40.42(7) The licensee or registrant is not required to control entrance or access to rooms or other areas containing sources of radiation capable of producing a high radiation area as described in 641—40.42(136C) if the registrant has met all the specific requirements for access and control specified in other applicable chapters such as 641—Chapter 45 for industrial radiography, 641—Chapter 41 for X-rays in the healing arts, and 641—Chapter 41 for particle accelerators.

641—40.43(136C) Control of access to very high radiation areas.

40.43(1) In addition to the requirements in 40.42(136C), the licensee or registrant shall institute measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rad (5 Gy) or more in 1 hour at 1 meter from a source

of radiation or any surface through which the radiation penetrates. This requirement does not apply to rooms or areas in which diagnostic X-ray systems are the only source of radiation, or to non-self-shielded irradiators.

40.43(2) The registrant is not required to control entrance or access to rooms or other areas containing sources of radiation capable of producing a very high radiation area as described in 40.43(1) if the registrant has met all the specific requirements for access and control specified in other applicable chapters such as 641—Chapter 45 for industrial radiography, 641—Chapter 41 for X-rays in the healing arts, and 641—Chapter 41 for particle accelerators.

641—40.44(136C) Control of access to very high radiation areas—irradiators.

40.44(1) This rule applies to licensees with sources of radiation in non-self-shielded irradiators. This rule does not apply to sources of radiation that are used in teletherapy, in industrial radiography, or in completely self-shielded irradiators in which the source of radiation is both stored and operated within the same shielding radiation barrier and, in the designed configuration of the irradiator, is always physically inaccessible to any individual and cannot create high levels of radiation in an area that is accessible to any individual.

40.44(2) Each area in which there may exist radiation levels in excess of 500 rad (5 Gy) in 1 hour at 1 meter from a source of radiation that is used to irradiate materials shall meet the following requirements:

a. Each entrance or access point shall be equipped with entry control devices which:

(1) Function automatically to prevent any individual from inadvertently entering a very high radiation area; and

(2) Permit deliberate entry into the area only after a control device is actuated that causes the radiation level within the area, from the source of radiation, to be reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour; and

(3) Prevent operation of the source of radiation if it would produce radiation levels in the area that could result in a deep dose equivalent to an individual in excess of 0.1 rem (1 mSv) in 1 hour.

b. Additional control devices shall be provided so that, upon failure of the entry control devices to function as required by 40.44(2)“*a*”:

(1) The radiation level within the area, from the source of radiation, is reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour; and

(2) Conspicuous visible and audible alarm signals are generated to make an individual attempting to enter the area aware of the hazard and at least one other authorized individual, who is physically present, familiar with the activity, and prepared to render or summon assistance, aware of the failure of the entry control devices.

c. The licensee shall provide control devices so that, upon failure or removal of physical radiation barriers other than the sealed source’s shielded storage container:

(1) The radiation level from the source of radiation is reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour; and

(2) Conspicuous visible and audible alarm signals are generated to make potentially affected individuals aware of the hazard and the licensee or at least one other individual, who is familiar with the activity and prepared to render or summon assistance, aware of the failure or removal of the physical barrier.

d. When the shield for stored sealed sources is a liquid, the licensee shall provide means to monitor the integrity of the shield and to signal, automatically, loss of adequate shielding.

e. Physical radiation barriers that comprise permanent structural components, such as walls, that have no credible probability of failure or removal in ordinary circumstances need not meet the requirements of 40.44(2)“*c*” and 40.44(2)“*d*.”

f. Each area shall be equipped with devices that will automatically generate conspicuous visible and audible alarm signals to alert personnel in the area before the source of radiation can be put into

operation and in time for any individual in the area to operate a clearly identified control device, which must be installed in the area and which can prevent the source of radiation from being put into operation.

g. Each area shall be controlled by use of such administrative procedures and such devices as are necessary to ensure that the area is cleared of personnel prior to each use of the source of radiation.

h. Each area shall be checked by a radiation measurement to ensure that, prior to the first individual's entry into the area after any use of the source of radiation, the radiation level from the source of radiation in the area is below that at which it would be possible for an individual to receive a deep dose equivalent in excess of 0.1 rem (1 mSv) in 1 hour.

i. The entry control devices required in 40.44(2) "a" shall be tested for proper functioning. See 40.89(136C) for record-keeping requirements.

(1) Testing shall be conducted prior to initial operation with the source of radiation on any day, unless operations were continued uninterrupted from the previous day; and

(2) Testing shall be conducted prior to resumption of operation of the source of radiation after any unintentional interruption; and

(3) The licensee or registrant shall submit and adhere to a schedule for periodic tests of the entry control and warning systems.

j. The licensee or registrant shall not conduct operations, other than those necessary to place the source of radiation in safe condition or to effect repairs on controls, unless control devices are functioning properly.

k. Entry and exit portals that are used in transporting materials to and from the irradiation area, and that are not intended for use by individuals, shall be controlled by such devices and administrative procedures as are necessary to physically protect and warn against inadvertent entry by any individual through these portals. Exit portals for irradiated materials shall be equipped to detect and signal the presence of any loose radioactive material that is carried toward such an exit and to automatically prevent loose radioactive material from being carried out of the area.

40.44(3) Licensees, registrants, or applicants for licenses or registrations for sources of radiation within the purview of 40.44(2) which will be used in a variety of positions or in locations, such as open fields or forests, that make it impracticable to comply with certain requirements of 40.44(2), such as those for the automatic control of radiation levels, may apply to the agency for approval of alternative safety measures. Alternative safety measures shall provide personnel protection at least equivalent to those specified in 40.44(2). At least one of the alternative measures shall include an entry-preventing interlock control based on a measurement of the radiation that ensures the absence of high radiation levels before an individual can gain access to the area where such sources of radiation are used.

40.44(4) The entry control devices required by 40.44(2) and 40.44(3) shall be established in such a way that no individual will be prevented from leaving the area.

641—40.45 to 40.47 Reserved.

RESPIRATORY PROTECTION AND CONTROLS TO RESTRICT
INTERNAL EXPOSURE IN RESTRICTED AREAS

641—40.48(136C) Use of process or other engineering controls. The licensee shall use, to the extent practical, process or other engineering controls, such as containment, decontamination, or ventilation, to control the concentrations of radioactive material in air.

641—40.49(136C) Use of other controls.

40.49(1) When it is not practical to apply process or other engineering controls to control the concentrations of radioactive material in air to values below those that define an airborne radioactivity area, the licensee shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means:

- a.* Control of access;
- b.* Limitation of exposure times;
- c.* Use of respiratory protection equipment; or

d. Other controls.

40.49(2) If the licensee performs an ALARA analysis to determine whether or not respirators should be used, the licensee may consider safety factors other than radiological factors. The licensee should also consider the impact of respirator use on workers' industrial health and safety.

641—40.50(136C) Use of individual respiratory protection equipment.

40.50(1) If the licensee assigns or permits the use of respiratory protection equipment to limit intakes pursuant to 40.49(136C):

a. The licensee shall use only respiratory protection equipment that is tested and certified by the National Institute for Occupational Safety and Health (NIOSH), except as otherwise noted in this subrule.

b. If the licensee wishes to use equipment that has not been tested or certified by the National Institute for Occupational Safety and Health or for which there is no schedule for testing or certification, the licensee shall submit an application for authorized use of that equipment, including a demonstration by testing, or a demonstration on the basis of reliable test information, that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use.

c. The licensee or registrant shall implement and maintain a respiratory protection program that includes:

(1) Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate doses;

(2) Surveys and bioassays, as appropriate, to evaluate actual intakes;

(3) Testing of respirators for operability (user seal check for face sealing devices and functional check for others) immediately prior to each use;

(4) Written procedures regarding monitoring, including air sampling and bioassays; supervision and training of respirator user; fit testing; respirator selection; breathing air quality; inventory and control; storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment; record keeping; and limitations on periods of respirator use and relief from respirator use;

(5) Determination by a physician that the individual user is medically fit to use respiratory protection equipment: before the initial fitting of a face-sealing respirator; before the first field use of non-face-sealing respirators; and either every 12 months thereafter, or periodically at a frequency determined by a physician; and

(6) Fit testing, with a fit factor equal to or greater than 10 times the APF for negative pressure devices, and a fit factor equal to or greater than 500 for any positive pressure, continuous flow, and pressure-demand devices, before the first field use of tight-fitting, face-sealing respirators and periodically thereafter at a frequency not to exceed one year. Fit testing must be performed with the facepiece operating in the negative pressure mode.

d. The licensee shall advise each respirator user that the user may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief.

e. The licensee shall also consider limitations appropriate to the type and mode of use. When selecting respiratory devices, the licensee shall provide for vision correction, adequate communication, low temperature work environments, and the concurrent use of other safety or radiological protection equipment. The licensee shall use equipment in such a way as not to interfere with the proper operation of the respirator.

f. Standby rescue persons are required whenever one-piece atmosphere-supplying suits or any combination of supplied air respiratory protection devices and personnel protection equipment is used from which an unaided individual would have difficulty extricating himself or herself. The standby rescue persons must be equipped with respiratory protection devices or other apparatus appropriate for the potential hazards. The standby rescue persons shall observe or otherwise maintain continuous communication (visual, voice, signal line, telephone, radio, or other suitable means) with the workers, and be immediately available to assist the workers in case of a failure of the air supply or for any

other reason that requires relief from distress. A sufficient number of standby rescue persons must be immediately available to assist all users of this type of equipment and to provide effective emergency rescue if needed.

g. Atmosphere-supplying respirators must be supplied with respirable air of grade D quality or better as defined by the Compressed Gas Association in publication G-7.1, "Commodity Specification for Air," 1997, and included in the regulations of the Occupational Safety and Health Administration (29 CFR 1910.134(i)(1)(ii)(A) through (E)). Grade D quality air criteria include:

- (1) Oxygen content (v/v) of 19.5 to 23.5 percent;
- (2) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
- (3) Carbon monoxide (CO) content of 10 ppm or less;
- (4) Carbon dioxide content of 1000 ppm or less; and
- (5) Lack of noticeable odor.

h. The licensee shall ensure that no objects, materials or substances, such as facial hair, or any conditions that interfere with the face, facepiece seal or valve function, and that are under the control of the respirator wearer, are present between the skin of the wearer's face and the sealing surface of a tight-fitting respirator facepiece.

i. In the estimation of the dose to individuals from intake of airborne radioactive materials, the concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the ambient concentration in air without respiratory protection, divided by the assigned protection factor. If the dose is later found to be greater than the estimated dose, the corrected value must be used. If the dose is later found to be less than the estimated dose, the corrected value may be used.

40.50(2) When estimating exposure of individuals to airborne radioactive materials, the licensee may make allowance for respiratory protection equipment used to limit intakes pursuant to 40.49(136C), provided that the following conditions, in addition to those in 40.50(1), are satisfied:

a. The licensee selects respiratory protection equipment that provides a protection factor, specified in Appendix A, greater than the multiple by which peak concentrations of airborne radioactive materials in the working area are expected to exceed the values specified in Appendix B, Table I, Column 3. However, if the selection of respiratory protection equipment with a protection factor greater than the multiple defined in the preceding sentence is inconsistent with the goal specified in 40.49(136C) of keeping the total effective dose equivalent ALARA, the licensee or registrant may select respiratory protection equipment with a lower protection factor provided that such a selection would result in a total effective dose equivalent that is ALARA. The concentration of radioactive material in the air that is inhaled when respirators are worn may be initially estimated by dividing the average concentration in air, during each period of uninterrupted use, by the protection factor. If the exposure is later found to be greater than initially estimated, the corrected value shall be used; if the exposure is later found to be less than initially estimated, the corrected value may be used.

b. The licensee shall obtain authorization from the agency before assigning respiratory protection factors in excess of those specified in Appendix A. The agency may authorize a licensee to use higher protection factors on receipt of an application that:

- (1) Describes the situation for which a need exists for higher protection factors, and
- (2) Demonstrates that the respiratory protection equipment provides these higher protection factors under the proposed conditions of use.

40.50(3) In an emergency, the licensee shall use as emergency equipment only respiratory protection equipment that has been specifically certified or had certification extended for emergency use by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration.

40.50(4) Further restrictions.

a. The licensee shall notify the agency in writing at least 30 days before the date that respiratory protection equipment is first used pursuant to either 40.50(1) or 40.50(2).

b. The agency may impose restrictions in addition to those listed in these rules in order to:

- (1) Ensure that the respiratory protection program of the licensee is adequate to limit doses to individuals from intakes of airborne radioactive materials consistent with maintaining total effective dose equivalent ALARA; and

(2) Limit the extent to which a licensee may use respiratory protection equipment instead of process or other engineering controls.

641—40.51 to 40.53 Reserved.

STORAGE AND CONTROL OF LICENSED OR REGISTERED
SOURCES OF RADIATION

641—40.54(136C) Security and control of licensed radioactive material in quantities of concern. Rescinded **ARC 1479C**, IAB 6/11/14, effective 7/16/14.

641—40.55(136C) Security and control of licensed or registered sources of radiation.

1. The licensee or registrant shall secure licensed or registered radioactive material that is stored in controlled or unrestricted areas from unauthorized removal or access.

2. The licensee or registrant shall maintain constant surveillance and use devices or administrative procedures to prevent unauthorized use of licensed or registered radioactive material that is in an unrestricted area and that is not in storage.

3. The registrant shall secure registered radiation machines from unauthorized removal.

4. The registrant shall use devices or administrative procedures to prevent unauthorized use of registered radiation machines.

5. Security requirements for portable gauges. Each portable gauge licensee shall use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever portable gauges are not under the control and constant surveillance of the licensee.

641—40.56(136C) Control of sources of radiation not in storage. Rescinded IAB 4/8/98, effective 7/1/98.

641—40.57 to 40.59 Reserved.

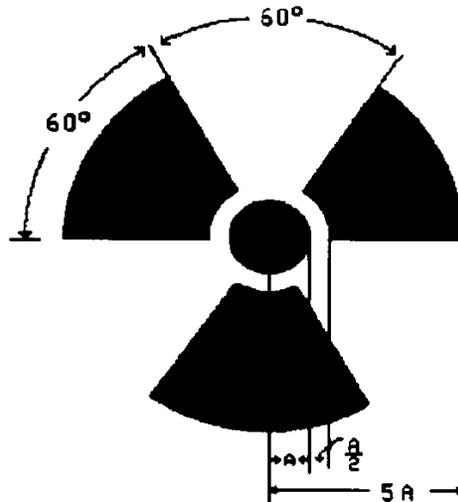
PRECAUTIONARY PROCEDURES

641—40.60(136C) Caution signs.

40.60(1) Standard radiation symbol. Unless otherwise authorized by the agency, the symbol prescribed by this rule shall use the colors magenta, or purple, or black on yellow background. The symbol prescribed is the three-bladed design as follows:

RADIATION SYMBOL

1. Cross-hatched area is to be magenta, or purple, or black, and
2. The background is to be yellow.



40.60(2) Exception to color requirements for standard radiation symbol. Notwithstanding the requirements of 40.60(1), licensees are authorized to label sources, source holders, or device components containing sources of radiation that are subjected to high temperatures, with conspicuously etched or stamped radiation caution symbols and without a color requirement.

40.60(3) Additional information on signs and labels. In addition to the contents of signs and labels prescribed in this chapter, the licensee or registrant shall provide, on or near the required signs and labels, additional information, as appropriate, to make individuals aware of potential radiation exposures and to minimize the exposures.

40.60(4) Improper posting or labeling. The licensee or registrant shall ensure that adequate measures are taken to prevent improper posting or labeling.

641—40.61(136C) Posting requirements.

40.61(1) Posting of radiation areas. The licensee or registrant shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words “CAUTION, RADIATION AREA”.

40.61(2) Posting of high radiation areas. The licensee or registrant shall post each high radiation area with a conspicuous sign or signs bearing the radiation symbol and the words “CAUTION, HIGH RADIATION AREA” or “DANGER, HIGH RADIATION AREA”.

40.61(3) Posting of very high radiation areas. The licensee or registrant shall post each very high radiation area with a conspicuous sign or signs bearing the radiation symbol and words “GRAVE DANGER, VERY HIGH RADIATION AREA”.

40.61(4) Posting of airborne radioactivity areas. The licensee shall post each airborne radioactivity area with a conspicuous sign or signs bearing the radiation symbol and the words “CAUTION, AIRBORNE RADIOACTIVITY AREA” or “DANGER, AIRBORNE RADIOACTIVITY AREA”.

40.61(5) Posting of areas or rooms in which licensed or registered material is used or stored. The licensee shall post each area or room in which there is used or stored an amount of licensed material exceeding ten times the quantity of such material specified in Appendix C with a conspicuous sign or signs bearing the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL(S)” or “DANGER, RADIOACTIVE MATERIAL(S)”.

641—40.62(136C) Exceptions to posting requirements.

40.62(1) A licensee or registrant is not required to post caution signs in areas or rooms containing sources of radiation for periods of less than eight hours, if each of the following conditions is met:

a. The sources of radiation are constantly attended during these periods by an individual who takes the precautions necessary to prevent the exposure of individuals to sources of radiation in excess of the limits established in this chapter; and

b. The area or room is subject to the licensee's or registrant's control.

40.62(2) Rooms or other areas in hospitals that are occupied by patients are not required to be posted with caution signs pursuant to 40.61(136C) provided that the patient could be released from licensee control pursuant to 641—subrule 41.2(27).

40.62(3) A room or area is not required to be posted with a caution sign because of the presence of a sealed source provided the radiation level at 30 centimeters from the surface of the sealed source container or housing does not exceed 0.005 rem (0.05 mSv) per hour.

40.62(4) A room or area is not required to be posted with a caution sign because of the presence of radiation machines used solely for diagnosis or simulation in the healing arts.

40.62(5) Rooms in hospitals or clinics that are used for teletherapy are exempt from the requirement to post caution signs under 641—40.61(136C) if:

a. Access to the room is controlled pursuant to 641—subrule 41.2(53); and

b. Personnel in attendance take necessary precautions to prevent an inadvertent exposure of workers, other patients, and members of the public to radiation in excess of the limits established in this chapter.

641—40.63(136C) Labeling containers and radiation machines.

40.63(1) The licensee shall ensure that each container of licensed material bears a durable, clearly visible label bearing the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL” or “DANGER, RADIOACTIVE MATERIAL”. The label shall also provide information, such as the radionuclides present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment, to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

40.63(2) Each licensee shall, prior to removal or disposal of empty uncontaminated containers to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive materials.

40.63(3) Each registrant shall ensure that each radiation machine is labeled in a conspicuous manner which cautions individuals that radiation is produced when it is energized.

641—40.64(136C) Exemptions to labeling requirements. A licensee is not required to label:

40.64(1) Containers holding licensed materials in quantities less than the quantities listed in Appendix C; or

40.64(2) Containers holding licensed material in concentrations less than those specified in Table III of Appendix B; or

40.64(3) Containers attended by an individual who takes the precautions necessary to prevent the exposure of individuals in excess of the limits established by this chapter; or

40.64(4) Containers when they are in transport and packaged and labeled in accordance with the rules of the U.S. Department of Transportation;¹ or

40.64(5) Containers that are accessible only to individuals authorized to handle or use them, or to work in the vicinity of the containers, if the contents are identified to these individuals by a readily available written record. Examples of containers of this type are containers in locations such as water-filled canals, storage vaults, or hot cells. The record shall be retained as long as the containers are in use for the purpose indicated on the record; or

40.64(6) Installed manufacturing or process equipment, such as piping and tanks.

¹ Labeling of packages containing radioactive materials is required by the U.S. Department of Transportation if the amount and type of radioactive material exceeds the limits for an excepted quantity or article as defined and limited by U.S. Department of Transportation regulations 49 CFR 173.403(m) and (w) and 173.421-424.

641—40.65(136C) Procedures for receiving and opening packages.

40.65(1) Each licensee who expects to receive a package containing quantities of radioactive material in excess of a Type A quantity shall make arrangements to receive:

- a. The package when the carrier offers it for delivery; or
- b. The notification of the arrival of the package at the carrier's terminal and to take possession of the package expeditiously.

40.65(2) Each licensee shall:

a. Monitor the external surfaces of a labeled¹ package for radioactive contamination unless the package contains only radioactive material in the form of gas or in special form as defined in 641—Chapter 38;

b. Monitor the external surfaces of a labeled¹ package for radiation levels unless the package contains quantities of radioactive material that are less than or equal to the Type A quantity; and

c. Monitor all packages known to contain radioactive material for radioactive contamination and radiation levels if there is evidence of degradation of package integrity, such as packages that are crushed, wet, or damaged.

40.65(3) The licensee shall perform the monitoring required by 40.65(2) as soon as practicable after receipt of the package, but not later than three hours after the package is received at the licensee's facility if it is received during the licensee's normal working hours, or not later than three hours from the beginning of the next working day if it is received after working hours.

40.65(4) The licensee shall immediately notify the final delivery carrier and, by telephone and telegram, mailgram, or facsimile, the agency when:

a. Removable radioactive surface contamination exceeds the limits of 49 CFR 173.443; or

b. External radiation levels exceed the limits of 10 CFR 71.47 as set forth in rule 641—39.5(136C).

40.65(5) Each licensee shall:

a. Establish, maintain, and retain written procedures for safely opening packages in which radioactive material is received; and

b. Ensure that the procedures are followed and that due consideration is given to special instructions for the type of package being opened.

40.65(6) Licensees transferring special form sources in vehicles owned or operated by the licensee or registrant to and from a work site are exempt from the contamination monitoring requirements of 40.65(2), but are not exempt from the monitoring requirement in 40.65(2), for measuring radiation levels that ensure that the source is still properly lodged in its shield.

¹ Labeled with a Radioactive e White I, Yellow II, or Yellow III label as specified in U.S. Department of Transportation regulations 49 CFR 172.403 and 172.436-440.

641—40.66 to 40.69 Reserved.

WASTE DISPOSAL

641—40.70(136C) General requirements.

40.70(1) A licensee shall dispose of licensed material only:

a. By transfer to an authorized recipient as provided in 40.74(136C) or 641—39.4(136C), or to the U.S. Department of Energy; or

b. By decay in storage; or

c. By release in effluents within the limits in 40.72(1) "d"; or

d. As authorized pursuant to 641—40.71(136C), 641—40.72(136C), 641—40.73(136C), 641—40.74(136C), or 641—40.77(136C).

40.70(2) A person shall be specifically licensed to receive waste containing licensed material from other persons for:

a. Treatment prior to disposal; or

b. Treatment or disposal by incineration; or

c. Decay in storage; or

d. Storage until transferred to a storage or disposal facility authorized to receive the waste.

641—40.71(136C) Method for obtaining approval of proposed disposal procedures. A licensee or applicant for a license may apply to the agency for approval of proposed procedures, not otherwise authorized in these rules, to dispose of licensed material generated in the licensee's operations. Each application shall include:

40.71(1) A description of the waste containing licensed material to be disposed of, including the physical and chemical properties that have an impact on risk evaluation, and the proposed manner and conditions of waste disposal; and

40.71(2) An analysis and evaluation of pertinent information on the nature of the environment; and

40.71(3) The nature and location of other potentially affected facilities; and

40.71(4) Analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in this chapter.

641—40.72(136C) Disposal by release into sanitary sewerage.

40.72(1) A licensee may discharge licensed material into sanitary sewerage if each of the following conditions is satisfied:

a. The material is readily soluble, or is readily dispersible biological material, in water; and

b. The quantity of licensed radioactive material that the licensee releases into the sewer in one month divided by the average monthly volume of water released into the sewer by the licensee does not exceed the concentration listed in Table III of Appendix B; and

c. If more than one radionuclide is released, the following conditions must also be satisfied:

(1) The licensee shall determine the fraction of the limit in Table III of Appendix B represented by discharges into sanitary sewerage by dividing the actual monthly average concentration of each radionuclide released by the licensee into the sewer by the concentration of that radionuclide listed in Table III of Appendix B; and

(2) The sum of the fractions for each radionuclide required by 40.72(1) "c"(1) does not exceed unity; and

d. The total quantity of licensed radioactive material that the licensee releases into the sanitary sewerage in a year does not exceed 5 Ci (185 GBq) of hydrogen-3, 1 Ci (37 GBq) of carbon-14, and 1 Ci (37 GBq) of all other radioactive materials combined.

40.72(2) Excreta from individuals undergoing medical diagnosis or therapy with radioactive material are not subject to the limitations contained in 40.72(1).

641—40.73(136C) Treatment or disposal by incineration. A licensee may treat or dispose of licensed materials by incineration only in the amounts and forms specified in 40.74(136C) or as specifically approved by the agency pursuant to 40.71(136C).

641—40.74(136C) Disposal of specific wastes.

40.74(1) A licensee may dispose of the following licensed material as if it were not radioactive:

a. 0.05 μCi (1.85 kBq), or less, of hydrogen-3 or carbon-14 per gram of medium used for liquid scintillation counting; and

b. 0.05 μCi (1.85 kBq), or less, of hydrogen-3 or carbon-14 per gram of animal tissue, averaged over the weight of the entire animal.

40.74(2) A licensee shall not dispose of tissue pursuant to 40.74(1) "b" in a manner that would permit its use either as food for humans or as animal feed.

40.74(3) The licensee shall maintain records in accordance with 40.88(136C).

641—40.75(136C) Transfer for disposal and manifests.

40.75(1) Any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal facility must document the information required on the Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee in accordance with Appendix D of this chapter.

40.75(2) Each shipment manifest must include a certification by the waste generator as specified in Section II of Appendix D of this chapter.

40.75(3) Each person involved in the transfer for disposal and disposal of waste, including the waste generator, waste collector, waste processor, and disposal facility operator, shall comply with the requirements specified in Section III of Appendix D of this chapter.

40.75(4) Any licensee shipping licensed material, as defined in paragraphs “3” and “4” of the definition of “by-product material” set forth in 641—Chapter 38, intended for ultimate disposal at a land disposal facility licensed under 10 CFR Part 61 must document the information required on the Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee in accordance with Appendix D of this chapter.

[ARC 8982B, IAB 8/11/10, effective 9/15/10]

641—40.76(136C) Compliance with environmental and health protection regulations. Nothing in 40.70(136C), 40.71(136C), 40.72(136C), 40.73(136C), 40.74(136C), or 40.75(136C) relieves the licensee or registrant from complying with other applicable federal, state and local regulations governing any other toxic or hazardous properties of materials that may be disposed of to 40.70(136C), 40.71(136C), 40.72(136C), 40.73(136C), 40.74(136C), or 40.75(136C).

641—40.77(136C) Disposal of certain by-product material.

40.77(1) Licensed material, as defined in paragraphs “3” and “4” of the definition of “by-product material” set forth in 641—Chapter 38, may be disposed of in accordance with 10 CFR Part 61, even though the material is not defined as low-level radioactive waste. Therefore, any licensed by-product material being disposed of at a facility, or transferred for ultimate disposal at a facility licensed under 10 CFR Part 61, must meet the requirements of 641—40.75(136C).

40.77(2) A licensee may dispose of licensed material, as defined in paragraphs “3” and “4” of the definition of “by-product material” set forth in 641—Chapter 38, at a disposal facility authorized to dispose of such material in accordance with any federal or state solid or hazardous waste law, including the Solid Waste Disposal Act, as authorized under the Energy Policy Act of 2005.

[ARC 8982B, IAB 8/11/10, effective 9/15/10]

641—40.78 and 40.79 Reserved.

RECORDS

641—40.80(136C) General provisions.

40.80(1) Each licensee or registrant shall use the special units curie, rad, rem and roentgen, counts per minute (cpm), disintegrations per minute (dpm), or the SI units becquerel, gray, sievert and coulomb per kilogram, including multiples and subdivisions, and shall clearly indicate the units of all quantities on records required by this chapter.

40.80(2) The licensee or registrant shall make a clear distinction among the quantities entered on the records required by this chapter, such as, total effective dose equivalent, total organ dose equivalent, shallow dose equivalent, lens dose equivalent, deep dose equivalent, or committed effective dose equivalent.

40.80(3) In the records required by this chapter, the licensee may record quantities in SI units in parentheses following each of the units specified in 40.80(1). However, all quantities must be recorded as stated in 40.80(1).

40.80(4) Notwithstanding the requirements of 40.80(1), when recording information on shipment manifests, as required in 641—40.75(136C), information must be recorded in the International System of Units (SI) or in SI and units as specified in 40.80(1).

40.80(5) Notwithstanding the requirements of 40.80(1), records of removable radioactive surface contamination on packages shall be recorded in disintegrations per minute (dpm).

641—40.81(136C) Records of radiation protection programs.

40.81(1) Each licensee or registrant shall maintain records of the radiation protection program, including:

- a. The provisions of the program; and
- b. Audits and other reviews of program content and implementation.

40.81(2) The licensee or registrant shall retain the records required by 40.81(1)“a” until the agency terminates each pertinent license or registration requiring the record. The licensee or registrant shall retain the records required by 40.81(1)“b” for three years after the record is made.

641—40.82(136C) Records of surveys.

40.82(1) Each licensee or registrant shall maintain records showing the results of surveys and calibrations required by 40.36(136C) and 40.65(2). The licensee or registrant shall retain these records for three years after the record is made.

40.82(2) The licensee or registrant shall retain each of the following records until the agency terminates each pertinent license or registration requiring the record:

- a. Records of the results of surveys to determine the dose from external sources of radiation used, in the absence of or in combination with individual monitoring data, in the assessment of individual dose equivalents; and
- b. Records of the results of measurements and calculations used to determine individual intakes of radioactive material and used in the assessment of internal dose; and
- c. Records showing the results of air sampling, surveys, and bioassays required pursuant to 40.50(1)“c”(1) and 40.50(1)“c”(2); and
- d. Records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment.

40.82(3) Upon termination of the license or registration, the licensee or registrant shall permanently store records required in 641—40.82(136C) or shall make provisions with the agency for transfer to the agency.

641—40.83(136C) Records of tests for leakage or contamination of sealed sources. Records of tests for leakage or contamination of sealed sources required by 40.32(136C) shall be kept in units of microcurie or becquerel and maintained for inspection by the agency for five years after the records are made.

641—40.84(136C) Records of prior occupational dose.

40.84(1) The licensee or registrant shall retain the records of prior occupational dose and exposure history as specified in 40.19(136C) until the agency terminates each pertinent license or registration requiring this record. The licensee or registrant shall retain records used in preparing the record required in 40.84(136C) for three years after the record is made.

40.84(2) Upon termination of the license or registration, the licensee or registrant shall permanently store records required in 40.84(136C) or shall make provisions with the agency for transfer to the agency.

641—40.85(136C) Records of planned special exposures.

40.85(1) For each use of the provisions of 40.20(136C) for planned special exposures, the licensee or registrant shall maintain records that describe:

- a. The exceptional circumstances requiring the use of a planned special exposure; and
- b. The name of the management official who authorized the planned special exposure and a copy of the signed authorization; and
- c. What actions were necessary; and
- d. Why the actions were necessary; and
- e. What precautions were taken to assure that doses were maintained ALARA; and
- f. What individual and collective doses were expected to result; and
- g. The doses actually received in the planned special exposure.

40.85(2) The licensee or registrant shall retain the records until the agency terminates each pertinent license or registration requiring these records.

40.85(3) Upon termination of the license or registration, the licensee or registrant shall permanently store records required in 40.85(136C) or shall make provisions with the agency for transfer to the agency.

641—40.86(136C) Records of individual monitoring results.

40.86(1) Record-keeping requirement. Each licensee or registrant shall maintain records of doses received by all individuals for whom monitoring was required pursuant to 40.37(136C), and records of doses received during planned special exposures, accidents, and emergency conditions. Assessments of dose equivalent and records made using units in effect on or before January 1, 1994, need not be changed. These records shall include, when applicable:

- a. The deep dose equivalent to the whole body, eye dose equivalent, shallow dose equivalent to the skin, and shallow dose equivalent to the extremities; and
- b. The estimated intake of radionuclides, see 40.16(136C); and
- c. The committed effective dose equivalent assigned to the intake of radionuclides; and
- d. The specific information used to calculate the committed effective dose equivalent pursuant to 40.18(3); and
- e. The total effective dose equivalent when required by 40.16(136C); and
- f. The total of the deep dose equivalent and the committed dose to the organ receiving the highest total dose.

40.86(2) Record-keeping frequency. The licensee or registrant shall make entries of the records specified in 40.86(1) at intervals not to exceed one year.

40.86(3) Record-keeping format. The licensee or registrant shall maintain the records specified in 40.86(1) in clear and legible form.

40.86(4) Embryo/Fetus records. The licensee or registrant shall maintain the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy, including the estimated date of conception, shall also be kept on file, but may be maintained separately from the dose records.

40.86(5) Retention during license or registration. The licensee or registrant shall retain each required form or record until the agency terminates each pertinent license or registration requiring the record.

40.86(6) Retention after termination. Upon termination of the license or registration, the licensee or registrant shall permanently store records required in 40.86(136C) or shall make provision with the agency for transfer to the agency.

641—40.87(136C) Records of dose to individual members of the public.

40.87(1) Each licensee or registrant shall maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public. See 40.26(136C).

40.87(2) The licensee or registrant shall retain the records required by this rule until the agency terminates each pertinent license or registration requiring the record.

641—40.88(136C) Records of waste disposal.

40.88(1) Each licensee shall maintain records of the disposal of licensed materials made pursuant to 40.71(136C), 40.72(136C), 40.73(136C), 40.74(136C), and disposal or burial in soil.

40.88(2) The licensee shall retain the records required by 40.88(1) until the agency terminates each pertinent license or registration requiring the record.

641—40.89(136C) Records of testing entry control devices for very high radiation areas.

40.89(1) Each licensee or registrant shall maintain records of tests made pursuant to 40.44(2) "j" on entry control devices for very high radiation areas. These records must include the date, time, and results of each such test of function.

40.89(2) The licensee or registrant shall retain the records required by 40.89(1) for three years after the record is made.

641—40.90(136C) Form of records.

40.90(1) Each record required by Chapter 40 shall be legible throughout the specified retention period. The record shall be the original or a reproduced copy or a microform provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period, or the record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records, such as letters, drawings, and specifications, shall include all pertinent information, such as stamps, initials, and signatures. The licensee or registrant shall maintain adequate safeguards against tampering with and loss of records.

40.90(2) The licensee or registrant shall retain the records required by Chapter 40 until the agency terminates each pertinent license or registration requiring the record.

641—40.91 to 40.94 Reserved.

REPORTS

641—40.95(136C) Reports of stolen, lost, or missing licensed or registered sources of radiation.

40.95(1) Telephone reports. Each licensee or registrant shall report to the agency by telephone as follows:

a. Immediately after its occurrence becomes known to the licensee, stolen, lost, or missing licensed radioactive material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in Appendix C under such circumstances that it appears to the licensee that an exposure could result to individuals in unrestricted areas; or

b. Within 30 days after its occurrence becomes known to the licensee, lost, stolen, or missing licensed radioactive material in quantity greater than ten times the quantity specified in Appendix C that is still missing.

c. Immediately after its occurrence becomes known to the registrant, a stolen, lost, or missing radiation machine.

d. Rescinded IAB 3/30/05, effective 5/4/05.

40.95(2) Written reports. Each licensee or registrant required to make a report pursuant to 40.95(1) shall, within 30 days after making the telephone report, make a written report to the agency setting forth the following information:

a. A description of the licensed or registered source of radiation involved, including, for radioactive material, the kind, quantity, and chemical and physical form; and, for radiation machines, the manufacturer, model and serial number, type and maximum energy of radiation emitted; and

b. A description of the circumstances under which the loss or theft occurred; and

c. A statement of disposition, or probable disposition, of the licensed or registered source of radiation involved; and

d. Exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible total effective dose equivalent to persons in unrestricted areas; and

e. Actions that have been taken, or will be taken, to recover the source of radiation; and

f. Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the loss or theft of licensed or registered sources of radiation.

40.95(3) Subsequent to filing the written report, the licensee or registrant shall also report additional substantive information on the loss or theft within 30 days after the licensee or registrant learns of such information.

40.95(4) The licensee or registrant shall prepare any report filed with the agency pursuant to 40.95(136C) so that names of individuals who may have received exposure to radiation are stated in a separate and detachable portion of the report.

641—40.96(136C) Notification of incidents.

40.96(1) Immediate notification. Notwithstanding other requirements for notification, each licensee or registrant shall immediately report each event involving a source of radiation possessed by the licensee or registrant that may have caused or threatens to cause any of the following conditions:

a. An individual to receive:

- (1) A total effective dose equivalent of 25 rem (0.25 Sv) or more; or
- (2) A lens dose equivalent of 75 rem (0.75 Sv) or more; or
- (3) A shallow dose equivalent to the skin or extremities of 250 rad (2.5 Gy) or more; or

b. The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake five times the annual limit on intake. This provision does not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

c. In addition to the requirements of paragraphs “*a*” and “*b*” above, each licensee shall notify the Iowa department of public health as soon as possible but not later than four hours after the discovery of an event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of licensed material that could exceed regulatory limits (events may include fires, explosions, toxic gas releases, and other such events).

40.96(2) Twenty-four-hour notification. Each licensee or registrant shall, within 24 hours of discovery of the event, report to the agency each event involving loss of control of a licensed or registered source of radiation possessed by the licensee or registrant that may have caused, or threatens to cause, any of the following conditions:

a. An individual to receive, in a period of 24 hours:

- (1) A total effective dose equivalent exceeding 5 rem (0.05 Sv); or
- (2) A lens dose equivalent exceeding 15 rem (0.15 Sv); or
- (3) A shallow dose equivalent to the skin or extremities exceeding 50 rem (0.5 Sv); or

b. The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational ALI. This provision does not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

c. In addition to the requirements of paragraphs “*a*” and “*b*” above, each licensee shall notify the Iowa department of public health within 24 hours after the discovery of any of the following events involving licensed material:

(1) An unplanned contamination event that:

1. Requires access to the contaminated area, by workers or the public, to be restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area;

2. Involves a quantity of material greater than five times the lowest annual limit on intake specified in Appendix B for the material; and

3. Has access to the area restricted for a reason other than to allow isotopes with a half-life of less than 24 hours to decay prior to decontamination.

(2) An event in which equipment is disabled or fails to function as designed when:

1. The equipment is required by regulation or license condition to prevent releases exceeding regulatory limits, to prevent exposures to radiation and radioactive materials exceeding regulatory limits, or to mitigate the consequences of an accident;

2. The equipment is required to be available and operable when it is disabled or fails to function; and

3. No redundant equipment is available and operable to perform the required safety function.

(3) An event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual’s clothing or body.

(4) An unplanned fire or explosion damaging any licensed material or any device, container, or equipment containing licensed material when:

1. The quantity of material involved is greater than five times the lowest annual limit on intake specified in Appendix B for the material; and

2. The damage affects the integrity of the licensed material or its container.

40.96(3) The licensee or registrant shall prepare each report filed with the agency pursuant to 40.96(136C) so that names of individuals who have received exposure to sources of radiation are stated in a separate and detachable portion of the report.

40.96(4) Licensees or registrants shall make the reports required by 40.96(1) and 40.96(2) to the agency by telephone, telegram, mailgram, or facsimile.

a. Licensees or registrants making initial reports to the Iowa department of public health shall to the extent that the information is available at the time of notification include:

- (1) The caller's name and call-back telephone number;
- (2) A description of the event, including date and time;
- (3) The exact location of the event;
- (4) The isotopes, quantities, and chemical and physical form of the licensed material involved; and
- (5) Any personnel radiation exposure data available.

b. Each licensee or registrant who makes a report required by 40.96(1) or 40.96(2) shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other rules may be submitted to fulfill this requirement if the reports contain all of the necessary information. These written reports must be sent to the Iowa Department of Public Health, Bureau of Radiological Health, Lucas State Office Building, Des Moines, Iowa 50319. The reports must include the following:

(1) A description of the event, including the probable cause and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;

- (2) The exact location of the event;
- (3) The isotopes, quantities, and chemical and physical form of the licensed material involved;
- (4) Date and time of the event;
- (5) Corrective actions taken or planned and the results of any evaluations or assessments; and
- (6) The extent of exposure of individuals to radiation or to radioactive materials without identification of individuals by name.

40.96(5) The provisions of 641—40.96(136C) do not apply to doses that result from planned special exposures, provided such doses are within the limits for planned special exposures and are reported pursuant to 641—40.98(136C).

641—40.97(136C) Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits.

40.97(1) Reportable events. In addition to the notification required by 40.96(136C), each licensee or registrant shall submit a written report within 30 days after learning of any of the following occurrences:

a. Incidents for which notification is required by 40.96(136C); or

b. Doses in excess of any of the following:

- (1) The occupational dose limits for adults in 40.15(136C); or
- (2) The occupational dose limits for a minor in 40.21(136C); or
- (3) The limits for an individual member of the public in 40.26(136C); or
- (4) Any applicable limit in the license or registration; or
- (5) The ALARA constraints for air emissions established under 641—40.10(136C); or
- (6) The limits for an embryo/fetus of a declared pregnant woman in 40.22(136C).

c. Levels of radiation or concentrations of radioactive material in:

(1) A restricted area in excess of applicable limits in the license or registration; or

(2) An unrestricted area in excess of ten times the applicable limit set forth in this chapter or in the license or registration, whether or not involving exposure of any individual in excess of the limits in 40.26(136C); or

d. For licensees subject to the provisions of U.S. Environmental Protection Agency's generally applicable environmental radiation standards in 40 CFR 190, levels of radiation or releases of radioactive material in excess of those standards, or of license conditions related to those standards.

40.97(2) Contents of reports.

a. Each report required by 40.97(1) shall describe the extent of exposure of individuals to radiation and radioactive material, including, as appropriate:

- (1) Estimates of each individual's dose; and
- (2) The levels of radiation and concentrations of radioactive material involved; and
- (3) The cause of the elevated exposures, dose rates, or concentrations; and
- (4) Corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, ALARA constraints, generally applicable environmental standards, and associated license conditions.

Each report filed pursuant to this paragraph must include the name, social security number, and date of birth for each occupationally overexposed individual. The report must be prepared so that this information is stated in a separate and detachable part of the report.

b. Each report filed pursuant to 40.97(1) shall include for each individual exposed: the name, social security account number, and date of birth. With respect to the limit for the embryo/fetus in 40.22(136C), the identifiers should be those of the declared pregnant woman. The report shall be prepared so that this information is stated in a separate and detachable portion of the report.

40.97(3) All licensees or registrants who make reports pursuant to 641—40.97(136C) or 641—40.98(136C) to the agency regarding exposure of an identified occupationally exposed individual, or of an identified member of the public, to radiation or radioactive material shall also provide a copy of the report to the individual or member of the public. Transmittal shall be at the same time as the transmittal to the agency.

[ARC 8982B, IAB 8/11/10, effective 9/15/10]

641—40.98(136C) Reports of planned special exposures. The licensee or registrant shall submit a written report to the agency within 30 days following any planned special exposure conducted in accordance with 40.20(136C) informing the agency that a planned special exposure was conducted and indicating the date the planned special exposure occurred and the information required by 40.85(136C).

641—40.99(136C) Reports of transactions involving nationally tracked sources. Each licensee who manufactures, transfers, receives, disassembles, or disposes of a nationally tracked source shall complete and submit a National Source Tracking Transaction Report as specified in subrules 40.99(1) to 40.99(5) for each type of transaction.

40.99(1) Each licensee that manufactures a nationally tracked source shall complete and submit a National Source Tracking Transaction Report. The report must include the following information:

- a.* The name, address, and license number of the reporting licensee;
- b.* The name of the individual preparing the report;
- c.* The manufacturer, model, and serial number of the source;
- d.* The radioactive material in the source;
- e.* The initial source strength in becquerels (curies) at the time of manufacture; and
- f.* The manufacture date of the source.

40.99(2) Each licensee that transfers a nationally tracked source to another person shall complete and submit a National Source Tracking Transaction Report. The report must include the following information:

- a.* The name, address, and license number of the reporting licensee;
- b.* The name of the individual preparing the report;
- c.* The name and license number of the recipient facility and the shipping address;
- d.* The manufacturer, model, and serial number of the source or, if not available, other information to uniquely identify the source;
- e.* The radioactive material in the source;
- f.* The initial or current source strength in becquerels (curies);
- g.* The date for which the source strength is reported;
- h.* The shipping date;
- i.* The estimated arrival date; and

j. For nationally tracked sources transferred as waste under a Uniform Low-Level Radioactive Waste Manifest, the waste manifest number and the container identification with the nationally tracked source.

40.99(3) Each licensee that receives a nationally tracked source shall complete and submit a National Source Tracking Transaction Report. The report must include the following information:

- a.* The name, address, and license number of the reporting licensee;
- b.* The name of the individual preparing the report;
- c.* The name, address, and license number of the person that provided the source;
- d.* The manufacturer, model, and serial number of the source or, if not available, other information to uniquely identify the source;
- e.* The radioactive material in the source;
- f.* The initial or current source strength in becquerels (curies);
- g.* The date for which the source strength is reported;
- h.* The date of receipt; and
- i.* For material received under a Uniform Low-Level Radioactive Waste Manifest, the waste manifest number and the container identification with the nationally tracked source.

40.99(4) Each licensee that disassembles a nationally tracked source shall complete and submit a National Source Tracking Transaction Report. The report must include the following information:

- a.* The name, address, and license number of the reporting licensee;
- b.* The name of the individual preparing the report;
- c.* The manufacturer, model, and serial number of the source or, if not available, other information to uniquely identify the source;
- d.* The radioactive material in the source;
- e.* The initial or current source strength in becquerels (curies);
- f.* The date for which the source strength is reported; and
- g.* The disassemble date of the source.

40.99(5) Each licensee that disposes of a nationally tracked source shall complete and submit a National Source Tracking Transaction Report. The report must include the following information:

- a.* The name, address, and license number of the reporting licensee;
- b.* The name of the individual preparing the report;
- c.* The waste manifest number;
- d.* The container identification with the nationally tracked source;
- e.* The date of disposal; and
- f.* The method of disposal.

40.99(6) Reports discussed in subrules 40.99(1) to 40.99(5) must be submitted by the close of the next business day after the transaction. A single report may be submitted for multiple sources and transactions. The reports must be submitted to the National Source Tracking System by using:

- a.* The on-line National Source Tracking System;
- b.* Electronically using a computer-readable format;
- c.* By facsimile;
- d.* By mail to the address on the National Source Tracking Transaction Report Form (NRC Form 748); or
- e.* By telephone with follow-up by facsimile or mail.

40.99(7) Each licensee shall correct any error in previously filed reports or file a new report for any missed transaction within five business days of the discovery of the error or missed transaction. Such errors may be detected by a variety of methods such as administrative reviews or by physical inventories required by regulation. In addition, each licensee shall reconcile the inventory of nationally tracked sources possessed by the licensee against that licensee's data in the National Source Tracking System. The reconciliation must be conducted during the month of January in each year. The reconciliation process must include resolving any discrepancies between the National Source Tracking System and the actual inventory by filing the reports identified by subrules 40.99(1) to 40.99(5). By January 31 of each

year, each licensee must submit to the National Source Tracking System confirmation that the data in the National Source Tracking System is correct.

40.99(8) Each licensee that possesses Category 1 nationally tracked sources shall report its initial inventory of Category 1 nationally tracked sources to the National Source Tracking System by January 31, 2009. Each licensee that possesses Category 2 nationally tracked sources shall report its initial inventory of Category 2 nationally tracked sources to the National Source Tracking System by January 31, 2009. The information may be submitted by using any of the methods identified in subrule 40.99(6). The initial inventory report must include the following information:

- a. The name, address, and license number of the reporting licensee;
- b. The name of the individual preparing the report;
- c. The manufacturer, model, and serial number of each nationally tracked source or, if not available, other information to uniquely identify the source;
- d. The radioactive material in the sealed source;
- e. The initial or current source strength in becquerels (curies); and
- f. The date for which the source strength is reported.

641—40.100(136C) Reports of individual monitoring.

40.100(1) This section applies to each person licensed or registered by the agency to:

- a. Possess or use sources of radiation for purposes of industrial radiography pursuant to 641—39.4(136C) and 641—Chapter 45; or
- b. Receive radioactive waste from other persons for disposal pursuant to 10 CFR Part 61 of federal regulations or appropriate other agreement state regulations; or
- c. Possess or use at any time, for processing or manufacturing for distribution pursuant to 641—39.4(136C) or 641—41.2(136C), radioactive material in quantities exceeding any one of the following quantities:

| Radionuclide | Activity ^a | |
|----------------|-----------------------|--------|
| | Ci | GBq |
| Cesium-137 | 1 | 37 |
| Cobalt-60 | 1 | 37 |
| Gold-198 | 100 | 3,700 |
| Iodine-131 | 1 | 37 |
| Iridium-192 | 10 | 370 |
| Krypton-85 | 1,000 | 37,000 |
| Promethium-147 | 10 | 370 |
| Technetium-99m | 1,000 | 37,000 |

^a The agency may require as a license condition, or by rule, regulation, or order pursuant to 40.105(136C), reports from licensees or registrants who are licensed or registered to use radionuclides not on this list, in quantities sufficient to cause comparable radiation levels.

40.100(2) Each licensee or registrant in a category listed in 40.100(1) shall submit an annual report of the results of individual monitoring carried out by the licensee or registrant for each individual for whom monitoring was required by 40.36(136C) during that year. The licensee or registrant may include additional data for individuals for whom monitoring was provided but not required.

40.100(3) The licensee or registrant shall file the report required by 40.100(2), covering the preceding year, on or before April 30 of each year. The licensee or registrant shall submit the report to the agency.

641—40.101(136C) Notifications and reports to individuals.

40.101(1) Requirements for notification and reports to individuals of exposure to radiation or radioactive material are specified in 641—40.112(136C).

40.101(2) When a licensee or registrant is required pursuant to 40.97(136C), 40.98(136C), or 40.100(136C) to report to the agency any exposure of an identified occupationally exposed individual,

or an identified member of the public, to radiation or radioactive material, the licensee or registrant shall also provide a copy of the report submitted to this agency to the individual. Such notice shall be transmitted at a time not later than the transmittal to the agency, and shall comply with the provisions of 40.112(1).

641—40.102(136C) Reports of leaking or contaminated sealed sources. The licensee shall file a report within five days with the agency if the test for leakage or contamination required pursuant to 40.32(136C) indicates a sealed source is leaking or contaminated. The report shall include the equipment involved, the test results and the corrective action taken.

641—40.103 and 40.104 Reserved.

ADDITIONAL REQUIREMENTS

641—40.105(136C) Vacating premises. Each specific licensee shall, no less than 30 days before vacating or relinquishing possession or control of premises which may have been contaminated with radioactive material as a result of their activities, notify the agency in writing of intent to vacate. When deemed necessary by the agency, the licensee shall decontaminate the premises in such a manner as the agency may specify.

641—40.106 to 40.109 Reserved.

NOTICES, INSTRUCTIONS, AND REPORTS TO WORKERS; INSPECTIONS

641—40.110(136C) Posting of notices to workers.

40.110(1) Each licensee or registrant, except those registrants with diagnostic X-ray systems, shall post current copies of the following documents:

- a. This subrule and 641—Chapter 40;
- b. The license, certificate of registration, conditions or documents incorporated into the license by reference and amendments thereto;
- c. The operating procedures applicable to activities under the license or registration; and
- d. Any notice of violation involving radiological working conditions, proposed imposition of civil penalty, or order issued pursuant to 641—Chapter 38, and any response from the licensee or registrant.

40.110(2) If posting of a document specified in 40.110(1)“a,” 40.110(1)“b” and 40.110(1)“c” is not practical, the licensee or registrant may post a notice which describes the document and states where it may be examined.

40.110(3) Agency Form “Notice to Employees” shall be posted by each licensee or registrant.

40.110(4) Agency documents posted pursuant to 40.110(1)“d” shall be posted within two working days after receipt of the documents from the agency; the licensee’s or registrant’s response, if any, shall be posted within two working days after dispatch from the licensee or registrant. Such documents shall remain posted for a minimum of five working days or until action correcting the violation has been completed, whichever is later.

40.110(5) Documents, notices, or forms posted pursuant to 40.110(1) shall appear in a sufficient number of places to permit individuals engaged in work under the license or registration to observe them on the way to or from any particular work location to which the document applies, shall be conspicuous, and shall be replaced if defaced or altered.

641—40.111(136C) Instructions to workers.

40.111(1) All individuals who in the course of employment are likely to receive in a year an occupational dose in excess of 100 mrem (1 mSv):

- a. Shall be kept informed of the storage, transfer, or use of sources of radiation;

b. Shall be instructed in the health protection problems associated with exposure to radiation or radioactive material to the individual and potential offspring, in precautions or procedures to minimize exposure, and in the purposes and functions of protective devices employed;

c. Shall be instructed in, and required to observe, to the extent within the worker's control, the applicable provisions of these rules and licenses for the protection of personnel from exposures to radiation or radioactive material occurring in such areas;

d. Shall be instructed of their responsibility to report promptly to the licensee or registrant any condition which may constitute, lead to, or cause a violation of the Act, these rules, and licenses or unnecessary exposure to radiation or radioactive material;

e. Shall be instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material; and

f. Shall be advised as to the radiation exposure reports which workers shall be furnished pursuant to 641—40.112(136C).

g. The instruction in “*b*” through “*f*” above shall be conducted at least annually.

h. Shall be commensurate with potential radiological health protection problems present in the workplace.

40.111(2) In determining those individuals subject to the requirements of 40.111(1), consideration must be given to assigning activities during normal and abnormal situations involving exposure to sources of radiation which can reasonably be expected to occur during the life of the facility. The extent of these instructions must be commensurate with potential radiological health protection problems present in the workplace.

641—40.112(136C) Notifications and reports to individuals.

40.112(1) Radiation exposure data for an individual and the results of any measurements, analyses, and calculations of radioactive material deposited or retained in the body of an individual shall be reported to the individual as specified in subrule 40.112(2). The information reported shall include data and results obtained pursuant to these rules, orders, or license conditions, as shown in records maintained by the licensee or registrant pursuant to 40.86(136C). Each notification and report shall:

a. Be in writing;

b. Include appropriate identifying data such as the name of the licensee or registrant, the name of the individual, and the individual's identification number, preferably social security number;

c. Include the individual's exposure information; and

d. Contain the following statement:

“This report is furnished to you under the provisions of 40.112(136C) of Iowa's Radiation Machine and Radioactive Materials rules. You should preserve this report for further reference.”

40.112(2) Each licensee or registrant shall make dose information available to workers as shown in records maintained by the licensee or registrant under the provisions of 641—40.86(136C). The licensee or registrant shall provide to each individual monitored under 641—40.37(136C) an annual report of the dose received in that monitoring year if:

a. The individual's occupational dose exceeds 100 mrem (1 mSv) TEDE or 100 mrem (1 mSv) to any individual organ or tissue, or

b. The individual requests the individual's annual dose report.

40.112(3) Each licensee or registrant shall furnish a report of the worker's exposure to sources of radiation at the request of a worker formerly engaged in activities controlled by the licensee or registrant. The report shall include the dose record for each year the worker was required to be monitored pursuant to 40.37(136C). Such report shall be furnished within 30 days from the date of the request, or within 30 days after the dose of the individual has been determined by the licensee or registrant, whichever is later. The report shall cover the period of time that the worker's activities involved exposure to sources of radiation and shall include the dates and locations of work under the license or registration in which the worker participated during this period.

40.112(4) When a licensee or registrant is required pursuant to 641—40.96(136C), 641—40.97(136C), or 641—40.98(136C) to report to the agency any exposure of an individual to

radiation or radioactive material, the licensee or the registrant shall also provide the individual a report on the individual's exposure data included in the report to the agency. Such reports shall be transmitted at a time not later than the transmittal to the agency.

40.112(5) At the request of a worker who is terminating employment with the licensee or registrant in work involving exposure to radiation or radioactive material, during the current year, each licensee or registrant shall provide at termination to each such worker, or to the worker's designee, a written report regarding the radiation dose received by that worker from operations of the licensee or registrant during the current year or fraction thereof. If the most recent individual monitoring results are not available at that time, a written estimate of the dose shall be provided together with a clear indication that this is an estimate.

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641—40.113(136C) Presence of representatives of licensees or registrants and workers during inspection.

40.113(1) Each licensee or registrant shall afford to the agency at all reasonable times opportunity to inspect materials, machines, activities, facilities, premises, and records pursuant to these rules.

40.113(2) During an inspection, agency inspectors may consult privately with workers as specified in 40.114(136C). The licensee or registrant may accompany agency inspectors during other phases of an inspection.

40.113(3) If, at the time of inspection, an individual has been authorized by the workers to represent them during agency inspections, the licensee or registrant shall notify the inspectors of such authorization and shall give the workers' representative an opportunity to accompany the inspectors during the inspection of physical working conditions.

40.113(4) Each worker's representative shall be routinely engaged in work under control of the licensee or registrant and shall have received instructions as specified in 40.111(136C).

40.113(5) Different representatives of licensees or registrants and workers may accompany the inspectors during different phases of an inspection if there is no resulting interference with the conduct of the inspection. However, only one worker's representative at a time may accompany the inspectors.

40.113(6) With the approval of the licensee or registrant and the workers' representative, an individual who is not routinely engaged in work under control of the licensee or registrant, for example, a consultant to the licensee or registrant or to the workers' representative, shall be afforded the opportunity to accompany agency inspectors during the inspection of physical working conditions.

40.113(7) Notwithstanding the other provisions of 40.113(136C), agency inspectors are authorized to refuse to permit accompaniment by any individual who deliberately interferes with a fair and orderly inspection. With regard to areas containing information classified by an agency of the U.S. Government in the interest of national security, an individual who accompanies an inspector may have access to such information only if authorized to do so. With regard to any area containing proprietary information, the workers' representative for that area shall be an individual previously authorized by the licensee or registrant to enter that area.

641—40.114(136C) Consultation with workers during inspections.

40.114(1) Agency inspectors may consult privately with workers concerning matters of occupational radiation protection and other matters related to applicable provisions of these rules and licenses to the extent the inspectors deem necessary for the conduct of an effective and thorough inspection.

40.114(2) During the course of an inspection, any worker may bring privately to the attention of the inspectors, either orally or in writing, any past or present condition which the worker has reason to believe may have contributed to or caused any violation of the Act, these rules, or license condition, or any unnecessary exposure of an individual to sources of radiation under the licensee's or registrant's control. Any such notice in writing shall comply with the requirements of 40.115(1).

40.114(3) The provisions of 40.114(2) shall not be interpreted as authorization to disregard instructions pursuant to 40.111(136C).

641—40.115(136C) Requests by workers for inspections.

40.115(1) Any worker or representative of workers believing that a violation of the Act, these rules, or license conditions exists or has occurred in work under a license or registration with regard to radiological working conditions in which the worker is engaged may request an inspection by giving notice of the alleged violation to the Bureau of Radiological Health, Iowa Department of Public Health, Lucas State Office Building, Des Moines, Iowa 50319-0075. Any such notice shall be in writing, shall set forth the specific grounds for the notice, and shall be signed by the worker or representative of the workers. A copy shall be provided to the licensee or registrant by the Bureau of Radiological Health, no later than at the time of inspection except that, upon the request of the worker giving such notice, such worker's name and the name of individuals referred to therein shall not appear in such copy or on any record published, released, or made available by the agency, except for good cause shown.

40.115(2) If, upon receipt of such notice, the Bureau of Radiological Health determines that the complaint meets the requirements set forth in 40.116(1), and that there are reasonable grounds to believe that the alleged violation exists or has occurred, an inspection shall be made as soon as practicable to determine if such alleged violation exists or has occurred. Inspections pursuant to 40.116(136C) need not be limited to matters referred to in the complaint.

40.115(3) No licensee, registrant, or contractor or subcontractor of a licensee or registrant shall discharge or in any manner discriminate against any worker because such worker has filed any complaint or instituted or caused to be instituted any proceeding under these rules or has testified or is about to testify in any such proceeding or because of the exercise by such worker on behalf of such worker or others of any option afforded by this chapter.

641—40.116(136C) Inspections not warranted—informal review.

40.116(1) a. If the Bureau of Radiological Health determines, with respect to a complaint under this rule, that an inspection is not warranted because there are no reasonable grounds to believe that a violation exists or has occurred, the Bureau of Radiological Health shall notify the complainant in writing of such determination. The complainant may obtain review of such determination by submitting a written statement of position with the Attorney General's Office. Such agency will provide the licensee or registrant with a copy of such statement by certified mail, excluding, at the request of the complainant, the name of the complainant. The licensee or registrant may submit an opposing written statement of position with the Attorney General's Office. Such agency will provide the complainant with a copy of such statement by certified mail.

b. Upon the request of the complainant, the Attorney General's Office may hold an informal conference in which the complainant and the licensee or registrant may orally present their views. An informal conference may also be held at the request of the licensee or registrant, but disclosure of the identity of the complainant will be made only following receipt of written authorization from the complainant. After considering all written and oral views presented, the Attorney General's Office shall affirm, modify, or reverse the determination of the Radiation Control Program and furnish the complainant and the licensee or registrant a written notification of the decision and the reason therefor.

40.116(2) If the Bureau of Radiological Health determines that an inspection is not warranted because the requirements of 40.116(1) have not been met, the complainant shall be notified in writing of such determination. Such determination shall be without prejudice to the filing of a new complaint meeting the requirements of 40.116(1).

641—40.117(136C) Employee protection.

40.117(1) Discrimination by a licensee or registrant, an applicant for a license or registration, or a contractor or subcontractor of a licensee or applicant against an employee for engaging in certain protected activities is prohibited. Discrimination includes discharge and other actions that relate to compensation, terms, conditions, or privileges of employment. The protected activities are established in 641—Chapters 38 to 45 and in general are related to the administration or enforcement of requirements imposed under 641—Chapters 38 to 45.

a. The protected activities include but are not limited to:

(1) Providing the agency or the individual's employer information about alleged violations of either of the statutes named in this rule or possible violations of requirements imposed under either of those statutes;

(2) Refusing to engage in any practice made unlawful under either of the statutes named in this rule or under these requirements if the employee has identified the alleged illegality to the employer;

(3) Requesting that the agency institute action against the individual's employer for the administration or enforcement of these requirements;

(4) Testifying in any agency proceeding, or before Congress, or at any federal or state proceeding regarding any provision (or proposed provision) of federal statutes or these rules;

(5) Assisting or participating in, or about to assist or participate in, these activities.

b. These activities are protected even if no formal proceeding is actually initiated as a result of the employee's assistance or participation.

c. This rule has no application to any employee alleging discrimination prohibited by this rule who, acting without direction from the individual's employer (or the employer's agent), deliberately causes a violation of any requirement of 641—Chapters 38 to 45.

40.117(2) Any employee who believes that the employee has been discharged or otherwise discriminated against by any person for engaging in protected activities specified in 40.117(1)“a” may seek a remedy for the discharge or discrimination through an administrative proceeding in the U.S. Department of Labor. The administrative proceeding must be initiated within 180 days after an alleged violation occurs. The employee may file for the administrative proceeding by filing a complaint alleging the violation with the Department of Labor, Employment Standards Administration, Wage and Hour Division. The Department of Labor may order reinstatement, back pay, and compensatory damages.

40.117(3) A violation of 40.117(1)“a”(1) or 40.117(1)“a”(4) by a licensee or registrant, an applicant for a license or registration, or a contractor or subcontractor of a licensee or applicant may be grounds for:

a. Denial, revocation, or suspension of the license or registration.

b. Imposition of a civil penalty on the licensee, registrant, or applicant.

c. Other enforcement action.

40.117(4) Actions taken by an employer or others which adversely affect an employee may be predicated upon nondiscriminatory grounds. The prohibition applies when the adverse action occurs because the employee has engaged in protected activities. An employee's engagement in protected activities does not automatically render the employee immune from discharge or discipline for legitimate reasons or from adverse action dictated by nonprohibited considerations.

40.117(5) No agreement affecting the compensation, terms, conditions, or privileges of employment, including an agreement to settle a complaint filed by an employee with the Department of Labor pursuant to 641—Chapters 38 to 45, may contain any provision which would prohibit, restrict, or otherwise discourage an employee from participating in protected activity as defined in 40.117(1)“a” including, but not limited to, providing information to the agency or to the individual's employer on potential violations or other matters within the agency's regulatory responsibilities.

CHAPTER 40

APPENDIX A

PROTECTION FACTORS FOR RESPIRATORS^a

| | Operating Mode | Assigned Protection Factor |
|--|---|----------------------------|
| I. Air-Purifying Respirators (particulate 1A ^b only) 1A ^c : | | |
| Filtering facepiece disposable ^d | Negative Pressure | (^d) |
| Facepiece, half ^e | Negative Pressure | 10 |
| Facepiece, full | Negative Pressure | 100 |
| Facepiece, half | Powered air-purifying respirators | 50 |
| Facepiece, full | Powered air-purifying respirators | 1000 |
| Helmet/hood | Powered air-purifying respirators | 1000 |
| Facepiece, loose-fitting | Powered air-purifying respirators | 25 |
| II. Atmosphere-Supplying Respirators (particulate, gases and vapors 1A ^f): | | |
| 1. Air-line respirator: | | |
| Facepiece, half | Demand | 10 |
| Facepiece, half | Continuous Flow | 50 |
| Facepiece, half | Pressure Demand | 50 |
| Facepiece, full | Demand | 100 |
| Facepiece, full | Continuous Flow | 1000 |
| Facepiece, full | Pressure Demand | 1000 |
| Helmet/hood | Continuous Flow | 1000 |
| Facepiece, loose-fitting | Continuous Flow | 25 |
| Suit | Continuous Flow | (^g) |
| 2. Self-contained breathing apparatus (SCBA): | | |
| Facepiece, full | Demand | ^h 100 |
| Facepiece, full | Pressure Demand | ⁱ 10,000 |
| Facepiece, full | Demand, Recirculating | ^h 100 |
| Facepiece, full | Positive Pressure Recirculating | ⁱ 10,000 |
| III. Combination Respirators: | | |
| Any combination of air-purifying and atmosphere-supplying respirators | (1) Assigned protection factor for type and mode of operation as listed above | |

^aThese assigned protection factors apply only in a respiratory protection program that meets the requirement of 641—Chapter 40. They are applicable only to airborne radiological hazards and may not be appropriate to circumstances when chemical or other respiratory hazards exist instead of, or in addition to, radioactive hazards. Selection and use of respirators for such circumstances must also comply with Department of Labor regulations.

Radioactive contaminants for which the concentration values in Table I, Column 3, of Appendix B to 641—Chapter 40 are based on internal dose due to inhalation may, in addition, present external exposure

hazards at higher concentrations. Under these circumstances, limitations on occupancy may have to be governed by external dose limits.

^bAir-purifying respirators with $APF < 100$ must be equipped with particulate filters that are at least 95 percent efficient. Air-purifying respirators with $APF = 100$ must be equipped with particulate filters that are at least 99 percent efficient. Air-purifying respirators with $APF > 100$ must be equipped with particulate filters that are at least 99.97 percent efficient.

^cThe licensee may apply to the agency for the use of an APF greater than 1 for sorbent cartridges as protection against airborne radioactive gases and vapors (e.g., radioiodine).

^dLicensees may permit individuals to use this type of respirator who have not been medically screened or fit tested on the device provided that no credit be taken for the use in estimating intake or dose. It is also recognized that it is difficult to perform an effective positive or negative pressure pre-use user seal check on this type of device. All other respiratory protection program requirements listed in 641—40.50(136C) apply. An assigned protection factor has not been assigned for these devices. However, an APF equal to 10 may be used if the licensee can demonstrate a fit factor of at least 100 by use of a validated or evaluated, qualitative or quantitative fit test.

^eUnder-chin type only. No distinction is made in this Appendix between elastomeric half-masks with replaceable cartridges and those designed with the filter medium as an integral part of the facepiece (e.g., disposable or reusable disposable). Both types are acceptable so long as the seal area of the latter contains some substantial type of seal-enhancing material such as rubber or plastic, the two or more suspension straps are adjustable, the filter medium is at least 95 percent efficient, and all other requirements of 641—Chapter 40 are met.

^fThe assigned protection factors for gases and vapors are not applicable to radioactive contaminants that present an absorption or submersion hazard. For tritium oxide vapor, approximately one-third of the intake occurs by absorption through the skin so that an overall protection factor of 3 is appropriate when atmosphere-supplying respirators are used to protect against tritium oxide. Exposure to radioactive noble gases is not considered a significant respiratory hazard, and protective actions for these contaminants should be based on external (submersion) dose considerations.

^gNo NIOSH approval schedule is currently available for atmosphere-supplying suits. This equipment may be used in an acceptable respiratory protection program as long as all the other minimum program requirements, with the exception of fit testing, are met.

^hThe licensee should implement institutional controls to ensure that these devices are not used in areas immediately dangerous to life or health.

ⁱThis type of respirator may be used as an emergency device in unknown concentrations for protection against inhalation hazards. External radiation hazards and other limitations to permitted exposure such as skin absorption shall be taken into account in these circumstances. This device may not be used by any individual who experiences perceptible outward leakage of breathing gas while wearing the device.

CHAPTER 40

APPENDIX B

ANNUAL LIMITS ON INTAKE (ALI) AND DERIVED AIR CONCENTRATIONS
(DAC) OF RADIONUCLIDES FOR OCCUPATIONAL EXPOSURE; EFFLUENT
CONCENTRATIONS; CONCENTRATIONS FOR RELEASE TO SANITARY SEWERAGE

Introduction

For each radionuclide, Table I indicates the chemical form which is to be used for selecting the appropriate ALI or DAC value. The ALIs and DACs for inhalation are given for an aerosol with an activity median aerodynamic diameter (AMAD) of 1 μm , micron, and for three classes (D,W,Y) of radioactive material, which refer to their retention (approximately days, weeks or years) in the pulmonary region of the lung. This classification applies to a range of clearance half-times for D if less than 10 days, for W from 10 to 100 days, and for Y greater than 100 days. Table II provides concentration limits for airborne and liquid effluents released to the general environment. Table III provides concentration limits for discharges to sanitary sewerage.

NOTE: The values in Tables I, II, and III are presented in the computer “E” notation. In this notation a value of 6E-02 represents a value of 6×10^{-2} or 0.06, 6E+2 represents 6×10^2 or 600, and 6E+0 represents 6×10^0 or 6.

TABLE I “OCCUPATIONAL VALUES”

Note that the columns in Table I of this appendix captioned “Oral Ingestion ALI,” “Inhalation ALI,” and “DAC,” are applicable to occupational exposure to radioactive material.

The ALIs in this appendix are the annual intakes of given radionuclide by “Reference Person” which would result in either (1) a committed effective dose equivalent of 5 rem (0.05 Sv), stochastic ALI, or (2) a committed dose equivalent of 50 rem (0.5 Sv) to an organ or tissue, nonstochastic ALI. The stochastic ALIs were derived to result in a risk, due to irradiation of organs and tissues, comparable to the risk associated with deep dose equivalent to the whole body of 5 rem (0.05 Sv). The derivation includes multiplying the committed dose equivalent to an organ or tissue by a weighting factor, w_T . This weighting factor is the proportion of the risk of stochastic effects resulting from irradiation of the organ or tissue, T, to the total risk of stochastic effects when the whole body is irradiated uniformly. The values of w_T are listed under the definition of weighting factor in 40.2. The nonstochastic ALIs were derived to avoid nonstochastic effects, such as prompt damage to tissue or reduction in organ function.

A value of $w_T = 0.06$ is applicable to each of the five organs or tissues in the “remainder” category receiving the highest dose equivalents, and the dose equivalents of all other remaining tissues may be disregarded. The following portions of the GI tract—stomach, small intestine, upper large intestine, and lower large intestine—are to be treated as four separate organs.

The air concentration values listed in Table II, Column 1 were derived by one of two methods. For those radionuclides for which the stochastic limit is governing, the occupational stochastic inhalation ALI was divided by 2.4×10^9 (ml), relating the inhalation ALI to the DAC, as explained above, and then divided by a factor of 300. The factor of 300 includes the following components: a factor of 50 to relate the 5 rem (0.05 Sv) annual occupational dose limit to the 0.1 rem limit for members of the public, a factor of 3 to adjust for the difference in exposure time and the inhalation rate for a worker and that for members of the public; and a factor of 2 to adjust the occupational values, derived for adults, so that they are applicable to other age groups.

When an ALI is defined by the stochastic dose limit, this value alone is given. When an ALI is determined by the nonstochastic dose limit to an organ, the organ or tissue to which the limit applies is shown, and the ALI for the stochastic limit is shown in parentheses. Abbreviated organ or tissue designations are used:

| | | |
|-----------|---|-----------------------------|
| LLI wall | = | lower large intestine wall; |
| St. wall | = | stomach wall; |
| Blad wall | = | bladder wall; and |
| Bone surf | = | bone surface. |

The use of the ALIs listed first, the more limiting of the stochastic and nonstochastic ALIs, will ensure that nonstochastic effects are avoided and that the risk of stochastic effects is limited to an acceptably low value. If, in a particular situation involving a radionuclide for which the nonstochastic ALI is limiting, use of that nonstochastic ALI is considered unduly conservative, the licensee may use the stochastic ALI to determine the committed effective dose equivalent. However, the licensee shall also ensure that the 50 rem (0.5 Sv) dose equivalent limit for any organ or tissue is not exceeded by the sum of the external deep dose equivalent plus the internal committed dose equivalent to that organ, not the effective dose. For the case where there is no external dose contribution, this would be demonstrated if the sum of the fractions of the nonstochastic ALIs (ALI_{ns}) that contribute to the committed dose equivalent to the organ receiving the highest dose does not exceed unity, that is, Σ (intake (in μCi) of each radionuclide/ ALI_{ns}) ≤ 1.0 . If there is an external deep dose equivalent contribution of H_d , then this sum must be less than $1 - (H_d/50)$, instead of ≤ 1.0 .

Note that the dose equivalents for an extremity, skin, and lens of the eye are not considered in computing the committed effective dose equivalent, but are subject to limits that must be met separately.

The derived air concentration (DAC) values are derived limits intended to control chronic occupational exposures. The relationship between the DAC and the ALI is given by:

$DAC = ALI(\text{in } \mu\text{Ci}) / (2000 \text{ hours per working year} \times 60 \text{ minutes/hour} \times 2 \times 10^4 \text{ ml per minute}) = [ALI / 2.4 \times 10^9] \mu\text{Ci/ml}$, where $2 \times 10^4 \text{ ml}$ is the volume of air breathed per minute at work by Reference Person under working conditions of light work.

The DAC values relate to one of two modes of exposure: either external submersion or the internal committed dose equivalents resulting from inhalation of radioactive materials. DACs based upon submersion are for immersion in a semi-infinite cloud of uniform concentration and apply to each radionuclide separately.

The ALI and DAC values include contributions to exposure by the single radionuclide named and any in-growth of daughter radionuclides produced in the body by decay of the parent. However, intakes that include both the parent and daughter radionuclides should be treated by the general method appropriate for mixtures.

The values of ALI and DAC do not apply directly when the individual both ingests and inhales a radionuclide, when the individual is exposed to a mixture of radionuclides by either inhalation or ingestion or both, or when the individual is exposed to both internal and external irradiation. See 641—40.16(136C). When an individual is exposed to radioactive materials which fall under several of the translocation classifications of the same radionuclide, such as, Class D, Class W, or Class Y, the exposure may be evaluated as if it were a mixture of different radionuclides.

It should be noted that the classification of a compound as Class D, W, or Y is based on the chemical form of the compound and does not take into account the radiological half-life of different radionuclides. For this reason, values are given for Class D, W, and Y compounds, even for very short-lived radionuclides.

TABLE II “EFFLUENT CONCENTRATIONS”

The columns in Table II of this appendix captioned “Effluents,” “Air” and “Water” are applicable to the assessment and control of dose to the public, particularly in the implementation of the provisions of 641—40.27(136C). The concentration values given in Columns 1 and 2 of Table II are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.05 rem (0.5 mSv).

Consideration of nonstochastic limits has not been included in deriving the air and water effluent concentration limits because nonstochastic effects are presumed not to occur at or below the dose levels

established for individual members of the public. For radionuclides, where the nonstochastic limit was governing in deriving the occupational DAC, the stochastic ALI was used in deriving the corresponding airborne effluent limit in Table II. For this reason, the DAC and airborne effluent limits are not always proportional as they were in Appendix A of this chapter of the eighth edition of Volume I of the Suggested State Regulations for Control of Radiation.

The air concentration values listed in Table II, Column 1 were derived by one of two methods. For those radionuclides for which the stochastic limit is governing, the occupational stochastic inhalation ALI was divided by 2.4×10^9 (ml), relating the inhalation ALI to the DAC, as explained above, and then divided by a factor of 300. The factor of 300 includes the following components: a factor of 50 to relate the 5 rem (0.05 Sv) annual occupational dose limit to the 0.1 rem limit for members of the public, a factor of 3 to adjust for the difference in exposure time and the inhalation rate for a worker and that for members of the public; and a factor of 2 to adjust the occupational values, derived for adults, so that they are applicable to other age groups.

For those radionuclides for which submersion, that is external dose, is limiting, the occupational DAC in Table I, Column 3 was divided by 219. The factor of 219 is composed of a factor of 50, as described above, and a factor of 4.38 relating occupational exposure for 2,000 hours per year to full-time exposure (8,760 hours per year). Note that an additional factor of 2 for age considerations is not warranted in the submersion case.

The water concentrations were derived by taking the most restrictive occupational stochastic oral ingestion ALI and dividing by 7.3×10^7 . The factor of 7.3×10^7 (ml) includes the following components: the factors of 50 and 2 described above and a factor of 7.3×10^5 (ml) which is the annual water intake of Reference Person.

Note 2 of this appendix provides groupings of radionuclides which are applicable to unknown mixtures of radionuclides. These groupings, including occupational inhalation ALIs and DACs, air and water effluent concentrations and releases to sewer, require demonstrating that the most limiting radionuclides in successive classes are absent. The limit for the unknown mixture is defined when the presence of one of the listed radionuclides cannot be definitely excluded as being present either from knowledge of the radionuclide composition of the source or from actual measurements.

TABLE III "RELEASES TO SEWERS"

The monthly average concentrations for release to sanitary sewerage are applicable to the provisions in 40.72. The concentration values were derived by taking the most restrictive occupational stochastic oral ingestion ALI and dividing by 7.3×10^6 (ml). The factor of 7.3×10^6 (ml) is composed of a factor of 7.3×10^5 (ml), the annual water intake by Reference Person, and a factor of 10, such that the concentrations, if the sewage released by the licensee were the only source of water ingested by a Reference Person during a year, would result in a committed effective dose equivalent of 0.5 rem.

LIST OF ELEMENTS

| Atomic | | | Atomic | | |
|-------------|---------------|---------------|-------------|---------------|---------------|
| <u>Name</u> | <u>Symbol</u> | <u>Number</u> | <u>Name</u> | <u>Symbol</u> | <u>Number</u> |
| Actinium | Ac | 89 | Mercury | Hg | 80 |
| Aluminum | Al | 13 | Molybdenum | Mo | 42 |
| Americium | Am | 95 | Neodymium | Nd | 60 |
| Antimony | Sb | 51 | Neptunium | Np | 93 |
| Argon | Ar | 18 | Nickel | Ni | 28 |
| Arsenic | As | 33 | Niobium | Nb | 41 |
| Astatine | At | 85 | Nitrogen | N | 7 |
| Barium | Ba | 56 | Osmium | Os | 76 |
| Berkelium | Bk | 97 | Oxygen | O | 8 |
| Beryllium | Be | 4 | Palladium | Pd | 46 |
| Bismuth | Bi | 83 | Phosphorus | P | 15 |

| | | | | | |
|-------------|----|-----|--------------|----|----|
| Bromine | Br | 35 | Platinum | Pt | 78 |
| Cadmium | Cd | 48 | Plutonium | Pu | 94 |
| Calcium | Ca | 20 | Polonium | Po | 84 |
| Californium | Cf | 98 | Potassium | K | 19 |
| Carbon | C | 6 | Praseodymium | Pr | 59 |
| Cerium | Ce | 58 | Promethium | Pm | 61 |
| Cesium | Cs | 55 | Protactinium | Pa | 91 |
| Chlorine | Cl | 17 | Radium | Ra | 88 |
| Chromium | Cr | 24 | Radon | Rn | 86 |
| Cobalt | Co | 27 | Rhenium | Re | 75 |
| Copper | Cu | 29 | Rhodium | Rh | 45 |
| Curium | Cm | 96 | Rubidium | Rb | 37 |
| Dysprosium | Dy | 66 | Ruthenium | Ru | 44 |
| Einsteinium | Es | 99 | Samarium | Sm | 62 |
| Erbium | Er | 68 | Scandium | Sc | 21 |
| Europium | Eu | 63 | Selenium | Se | 34 |
| Fermium | Fm | 100 | Silicon | Si | 14 |
| Fluorine | F | 9 | Silver | Ag | 47 |
| Francium | Fr | 87 | Sodium | Na | 11 |
| Gadolinium | Gd | 64 | Strontium | Sr | 38 |
| Gallium | Ga | 31 | Sulfur | S | 16 |
| Germanium | Ge | 32 | Tantalum | Ta | 73 |
| Gold | Au | 79 | Technetium | Tc | 43 |
| Hafnium | Hf | 72 | Tellurium | Te | 52 |
| Holmium | Ho | 67 | Terbium | Tb | 65 |
| Hydrogen | H | 1 | Thallium | Tl | 81 |
| Indium | In | 49 | Thorium | Th | 90 |
| Iodine | I | 53 | Thulium | Tm | 69 |
| Iridium | Ir | 77 | Tin | Sn | 50 |
| Iron | Fe | 26 | Titanium | Ti | 22 |
| Krypton | Kr | 36 | Tungsten | W | 74 |
| Lanthanum | La | 57 | Uranium | U | 92 |
| Lead | Pb | 82 | Vanadium | V | 23 |
| Lutetium | Lu | 71 | Xenon | Xe | 54 |
| Magnesium | Mg | 12 | Ytterbium | Yb | 70 |
| Manganese | Mn | 25 | Yttrium | Y | 39 |
| Mendelevium | Md | 101 | Zinc | Zn | 30 |
| | | | Zirconium | Zr | 40 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|--------------------------|--|------------|--------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | ALI (μCi) | ALI (μCi) | DAC (μCi/ml) | | | | |
| 1 | Hydrogen-3 | Water, DAC includes skin absorption | 8E+4 | 8E+4 | 2E-5 | 1E-7 | 1E-3 | 1E-2 |
| | | Gas (HT or T ₂) Submersion ¹ : Use above values as HT and T ₂ oxidize in air and in the body to HTO. | | | | | | |
| 4 | Beryllium-7 | W, all compounds except those given for Y | 4E+4 | 2E+4 | 9E-6 | 3E-8 | 6E-4 | 6E-3 |
| | | Y, oxides, halides, and nitrates | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 4 | Beryllium-10 | W, see ⁷ Be | 1E+3 | 2E+2 | 6E-8 | 2E-10 | - | - |
| | | LLI wall | (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | Y, see ⁷ Be | - | 1E+1 | 6E-9 | 2E-11 | - | - |
| 6 | Carbon-11 ² | Monoxide | - | 1E+6 | 5E-4 | 2E-6 | - | - |
| | | Dioxide | - | 6E+5 | 3E-4 | 9E-7 | - | - |
| | | Compounds | 4E+5 | 4E+5 | 2E-4 | 6E-7 | 6E-3 | 6E-2 |
| 6 | Carbon-14 | Monoxide | - | 2E+6 | 7E-4 | 2E-6 | - | - |
| | | Dioxide | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | Compounds | 2E+3 | 2E+3 | 1E-6 | 3E-9 | 3E-5 | 3E-4 |
| 7 | Nitrogen-13 ² | Submersion ¹ | - | - | 4E-6 | 2E-8 | - | - |
| 8 | Oxygen-15 ² | Submersion ¹ | - | - | 4E-6 | 2E-8 | - | - |
| 9 | Fluorine-18 ² | D, fluorides of H, Li, Na, K, Rb, Cs, and Fr | 5E+4 | 7E+4 | 3E-5 | 1E-7 | - | - |
| | | St wall | (5E+4) | - | - | - | 7E-4 | 7E-3 |
| | | W, fluorides of Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, As, Sb, Bi, Fe, Ru, Os, Co, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, V, Nb, Ta, Mn, Tc, and Re | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| | | Y, lanthanum fluoride | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| 11 | Sodium-22 | D, all compounds | 4E+2 | 6E+2 | 3E-7 | 9E-10 | 6E-6 | 6E-5 |
| 11 | Sodium-24 | D, all compounds | 4E+3 | 5E+3 | 2E-6 | 7E-9 | 5E-5 | 5E-4 |
| 12 | Magnesium-28 | D, all compounds except those given for W | 7E+2 | 2E+3 | 7E-7 | 2E-9 | 9E-6 | 9E-5 |
| | | W, oxides, hydroxides, carbides, halides, and nitrates | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 13 | Aluminum-26 | D, all compounds except those given for W | 4E+2 | 6E+1 | 3E-8 | 9E-11 | 6E-6 | 6E-5 |
| | | W, oxides, hydroxides, carbides, halides, and nitrates | - | 9E+1 | 4E-8 | 1E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------|--|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 14 Silicon-31 | D, all compounds except those given for W and Y | 9E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| | W, oxides, hydroxides, carbides, and nitrates | - | 3E+4 | 1E-5 | 5E-8 | - | - |
| | Y, aluminosilicate glass | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 14 Silicon-32 | D, see ³¹ Si | 2E+3 | 2E+2 | 1E-7 | 3E-10 | - | - |
| | LLI wall | (3E+3) | - | - | - | 4E-5 | 4E-4 |
| | W, see ³¹ Si | - | 1E+2 | 5E-8 | 2E-10 | - | - |
| 15 Phosphorus-32 | D, all compounds except phosphates given for W | 6E+2 | 9E+2 | 4E-7 | 1E-9 | 9E-6 | 9E-5 |
| | W, phosphates of Zn ²⁺ , S ³⁺ , Mg ²⁺ , Fe ³⁺ , Bi ³⁺ , and lanthanides | - | 4E+2 | 2E-7 | 5E-10 | - | - |
| | Y, see ³¹ Si | - | 5E+0 | 2E-9 | 7E-12 | - | - |
| 15 Phosphorus-33 | D, see ³² P | 6E+3 | 8E+3 | 4E-6 | 1E-8 | 8E-5 | 8E-4 |
| | W, see ³² P | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 16 Sulfur-35 | Vapor | - | 1E+4 | 6E-6 | 2E-8 | - | - |
| | D, sulfides and sulfates except those given for W | 1E+4 | 2E+4 | 7E-6 | 2E-8 | - | - |
| | LLI wall | (8E+3) | - | - | - | 1E-4 | 1E-3 |
| | W, elemental sulfur, sulfides of Sr, Ba, Ge, Sn, Pb, As, Sb, Bi, Cu, Ag, Au, Zn, Cd, Hg, W, and Mo. Sulfates of Ca, Sr, Ba, Ra, As, Sb, and Bi | 6E+3 | - | - | - | - | - |
| 17 Chlorine-36 | D, chlorides of H, Li, Na, K, Rb, Cs, and Fr | 2E+3 | 2E+3 | 1E-6 | 3E-9 | 2E-5 | 2E-4 |
| | W, chlorides of lanthanides, Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Tc, and Re | - | 2E+2 | 1E-7 | 3E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|--|-----------------------------------|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 17 | Chlorine-38 ² | D, see ³⁶ Cl | 2E+4 | 4E+4 | 2E-5 | 6E-8 | - | - |
| | | St wall | (3E+4) | - | - | - | 3E-4 | 3E-3 |
| | | W, see ³⁶ Cl | - | 5E+4 | 2E-5 | 6E-8 | - | - |
| 17 | Chlorine-39 ² | D, see ³⁶ Cl | 2E+4 | 5E+4 | 2E-5 | 7E-8 | - | - |
| | | St wall | (4E+4) | - | - | - | 5E-4 | 5E-3 |
| | | W, see ³⁶ Cl | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| 18 | Argon-37 | Submersion ¹ | - | - | 1E+0 | 6E-3 | - | - |
| 18 | Argon-39 | Submersion ¹ | - | - | 2E-4 | 8E-7 | - | - |
| 18 | Argon-41 | Submersion ¹ | - | - | 3E-6 | 1E-8 | - | - |
| 19 | Potassium-40 | D, all compounds | 3E+2 | 4E+2 | 2E-7 | 6E-10 | 4E-6 | 4E-5 |
| 19 | Potassium-42 | D, all compounds | 5E+3 | 5E+3 | 2E-6 | 7E-9 | 6E-5 | 6E-4 |
| 19 | Potassium-43 | D, all compounds | 6E+3 | 9E+3 | 4E-6 | 1E-8 | 9E-5 | 9E-4 |
| 19 | Potassium-44 ² | D, all compounds | 2E+4 | 7E+4 | 3E-5 | 9E-8 | - | - |
| | | St wall | (4E+4) | - | - | - | 5E-4 | 5E-3 |
| 19 | Potassium-45 ² | D, all compounds | 3E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | St wall | (5E+4) | - | - | - | 7E-4 | 7E-3 |
| 20 | Calcium-41 | W, all compounds | 3E+3 | 4E+3 | 2E-6 | - | - | - |
| | | Bone surf | (4E+3) | (4E+3) | - | 5E-9 | 6E-5 | 6E-4 |
| 20 | Calcium-45 | W, all compounds | 2E+3 | 8E+2 | 4E-7 | 1E-9 | 2E-5 | 2E-4 |
| 20 | Calcium-47 | W, all compounds | 8E+2 | 9E+2 | 4E-7 | 1E-9 | 1E-5 | 1E-4 |
| 21 | Scandium-43 | Y, all compounds | 7E+3 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| 21 | Scandium-44m | Y, all compounds | 5E+2 | 7E+2 | 3E-7 | 1E-9 | 7E-6 | 7E-5 |
| 21 | Scandium-44 | Y, all compounds | 4E+3 | 1E+4 | 5E-6 | 2E-8 | 5E-5 | 5E-4 |
| 21 | Scandium-46 | Y, all compounds | 9E+2 | 2E+2 | 1E-7 | 3E-10 | 1E-5 | 1E-4 |
| 21 | Scandium-47 | Y, all compounds | 2E+3 | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | LLI wall | (3E+3) | - | - | - | 4E-5 | 4E-4 |
| 21 | Scandium-48 | Y, all compounds | 8E+2 | 1E+3 | 6E-7 | 2E-9 | 1E-5 | 1E-4 |
| 21 | Scandium-49 ² | Y, all compounds | 2E+4 | 5E+4 | 2E-5 | 8E-8 | 3E-4 | 3E-3 |
| 22 | Titanium-44 | D, all compounds except those given for W and Y | 3E+2 | 1E+1 | 5E-9 | 2E-11 | 4E-6 | 4E-5 |
| | | W, oxides, hydroxides, carbides, halides, and nitrates | - | 3E+1 | 1E-8 | 4E-11 | - | - |
| | | Y, SrTiO | - | 6E+0 | 2E-9 | 8E-12 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|-------------------------------|---|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 22 Titanium-45 | D, see ⁴⁴ Ti | 9E+3 | 3E+4 | 1E-5 | 3E-8 | 1E-4 | 1E-3 |
| | W, see ⁴⁴ Ti | - | 4E+4 | 1E-5 | 5E-8 | - | - |
| | Y, see ⁴⁴ Ti | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 23 Vanadium-47 ² | D, all compounds except those given for W | 3E+4 | 8E+4 | 3E-5 | 1E-7 | - | - |
| | St wall | (3E+4) | - | - | - | 4E-4 | 4E-3 |
| 23 Vanadium-48 | W, oxides, hydroxides, carbides, and halides | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| | D, see ⁴⁷ V | 6E+2 | 1E+3 | 5E-7 | 2E-9 | 9E-6 | 9E-5 |
| 23 Vanadium-49 | W, see ⁴⁷ V | - | 6E+2 | 3E-7 | 9E-10 | - | - |
| | D, see ⁴⁷ V | 7E+4 | 3E+4 | 1E-5 | - | - | - |
| 24 Chromium-48 | LLI wall | (9E+4) | (3E+4) | - | 5E-8 | 1E-3 | 1E-2 |
| | Bone surf | - | 2E+4 | 8E-6 | 2E-8 | - | - |
| | W, see ⁴⁷ V | - | 2E+4 | 8E-6 | 2E-8 | - | - |
| 24 Chromium-49 ² | D, all compounds except those given for W and Y | 6E+3 | 1E+4 | 5E-6 | 2E-8 | 8E-5 | 8E-4 |
| | W, halides and nitrates | - | 7E+3 | 3E-6 | 1E-8 | - | - |
| | Y, oxides and hydroxides | - | 7E+3 | 3E-6 | 1E-8 | - | - |
| 24 Chromium-51 | D, see ⁴⁸ Cr | 3E+4 | 8E+4 | 4E-5 | 1E-7 | 4E-4 | 4E-3 |
| | W, see ⁴⁸ Cr | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| | Y, see ⁴⁸ Cr | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 25 Manganese-51 ² | D, see ⁴⁸ Cr | 4E+4 | 5E+4 | 2E-5 | 6E-8 | 5E-4 | 5E-3 |
| | W, see ⁴⁸ Cr | - | 2E+4 | 1E-5 | 3E-8 | - | - |
| | Y, see ⁴⁸ Cr | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 25 Manganese-52 ^{m2} | D, all compounds except those given for W | 2E+4 | 5E+4 | 2E-5 | 7E-8 | 3E-4 | 3E-3 |
| | W, oxides, hydroxides, halides, and nitrates | - | 6E+4 | 3E-5 | 8E-8 | - | - |
| 25 Manganese-52 | D, see ⁵¹ Mn | 3E+4 | 9E+4 | 4E-5 | 1E-7 | - | - |
| | St wall | (4E+4) | - | - | - | 5E-4 | 5E-3 |
| | W, see ⁵¹ Mn | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 25 Manganese-52 | D, see ⁵¹ Mn | 7E+2 | 1E+3 | 5E-7 | 2E-9 | 1E-5 | 1E-4 |
| | W, see ⁵¹ Mn | - | 9E+2 | 4E-7 | 1E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-------------------------|--|------------|-----------|-------------------------------------|----------------|--|--------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC (μCi/ml) |
| 25 | Manganese-53 | D, see ⁵¹ Mn | 5E+4 | 1E+4 | 5E-6 | - | 7E-4 | 7E-3 |
| | | | | Bone surf | | | | |
| | | | - | (2E+4) | - | 3E-8 | - | - |
| | | W, see ⁵¹ Mn | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 25 | Manganese-54 | D, see ⁵¹ Mn | 2E+3 | 9E+2 | 4E-7 | 1E-9 | 3E-5 | 3E-4 |
| | | W, see ⁵¹ Mn | - | 8E+2 | 3E-7 | 1E-9 | - | - |
| 25 | Manganese-56 | D, see ⁵¹ Mn | 5E+3 | 2E+4 | 6E-6 | 2E-8 | 7E-5 | 7E-4 |
| | | W, see ⁵¹ Mn | - | 2E+4 | 9E-6 | 3E-8 | - | - |
| 26 | Iron-52 | D, all compounds except those given for W | 9E+2 | 3E+3 | 1E-6 | 4E-9 | 1E-5 | 1E-4 |
| | | W, oxides, hydroxides, and halides | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 26 | Iron-55 | D, see ⁵² Fe | 9E+3 | 2E+3 | 8E-7 | 3E-9 | 1E-4 | 1E-3 |
| | | W, see ⁵² Fe | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| 26 | Iron-59 | D, see ⁵² Fe | 8E+2 | 3E+2 | 1E-7 | 5E-10 | 1E-5 | 1E-4 |
| | | W, see ⁵² Fe | - | 5E+2 | 2E-7 | 7E-10 | - | - |
| 26 | Iron-60 | D, see ⁵² Fe | 3E+1 | 6E+0 | 3E-9 | 9E-12 | 4E-7 | 4E-6 |
| | | W, see ⁵² Fe | - | 2E+1 | 8E-9 | 3E-11 | - | - |
| 27 | Cobalt-55 | W, all compounds except those given for Y | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 2E-5 | 2E-4 |
| | | Y, oxides, hydroxides, halides, and nitrates | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 27 | Cobalt-56 | W, see ⁵⁵ Co | 5E+2 | 3E+2 | 1E-7 | 4E-10 | 6E-6 | 6E-5 |
| | | Y, see ⁵⁵ Co | 4E+2 | 2E+2 | 8E-8 | 3E-10 | - | - |
| 27 | Cobalt-57 | W, see ⁵⁵ Co | 8E+3 | 3E+3 | 1E-6 | 4E-9 | 6E-5 | 6E-4 |
| | | Y, see ⁵⁵ Co | 4E+3 | 7E+2 | 3E-7 | 9E-10 | - | - |
| 27 | Cobalt-58m | W, see ⁵⁵ Co | 6E+4 | 9E+4 | 4E-5 | 1E-7 | 8E-4 | 8E-3 |
| | | Y, see ⁵⁵ Co | - | 6E+4 | 3E-5 | 9E-8 | - | - |
| 27 | Cobalt-58 | W, see ⁵⁵ Co | 2E+3 | 1E+3 | 5E-7 | 2E-9 | 2E-5 | 2E-4 |
| | | Y, see ⁵⁵ Co | 1E+3 | 7E+2 | 3E-7 | 1E-9 | - | - |
| 27 | Cobalt-60m ² | W, see ⁵⁵ Co | 1E+6 | 4E+6 | 2E-3 | 6E-6 | - | - |
| | | St wall | (1E+6) | - | - | - | 2E-2 | 2E-1 |
| | | Y, see ⁵⁵ Co | - | 3E+6 | 1E-3 | 4E-6 | - | - |
| 27 | Cobalt-60 | W, see ⁵⁵ Co | 5E+2 | 2E+2 | 7E-8 | 2E-10 | 3E-6 | 3E-5 |
| | | Y, see ⁵⁵ Co | 2E+2 | 3E+1 | 1E-8 | 5E-11 | - | - |
| 27 | Cobalt-61 ² | W, see ⁵⁵ Co | 2E+4 | 6E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| | | Y, see ⁵⁵ Co | 2E+4 | 6E+4 | 2E-5 | 8E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-------------------------|---|---|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 27 | Cobalt-62m ² | W, see ⁵⁵ Co | 4E+4 | 2E+5 | 7E-5 | 2E-7 | - | - |
| | | St wall | (5E+4) | - | - | - | 7E-4 | 7E-3 |
| | | Y, see ⁵⁵ Co | - | 2E+5 | 6E-5 | 2E-7 | - | - |
| 28 | Nickel-56 | D, all compounds except those given for W | 1E+3 | 2E+3 | 8E-7 | 3E-9 | 2E-5 | 2E-4 |
| | | W, oxides, hydroxides, and carbides | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| | | Vapor | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 28 | Nickel-57 | D, see ⁵⁶ Ni | 2E+3 | 5E+3 | 2E-6 | 7E-9 | 2E-5 | 2E-4 |
| | | W, see ⁵⁶ Ni | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | Vapor | - | 6E+3 | 3E-6 | 9E-9 | - | - |
| 28 | Nickel-59 | D, see ⁵⁶ Ni | 2E+4 | 4E+3 | 2E-6 | 5E-9 | 3E-4 | 3E-3 |
| | | W, see ⁵⁶ Ni | - | 7E+3 | 3E-6 | 1E-8 | - | - |
| | | Vapor | - | 2E+3 | 8E-7 | 3E-9 | - | - |
| 28 | Nickel-63 | D, see ⁵⁶ Ni | 9E+3 | 2E+3 | 7E-7 | 2E-9 | 1E-4 | 1E-3 |
| | | W, see ⁵⁶ Ni | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | Vapor | - | 8E+2 | 3E-7 | 1E-9 | - | - |
| 28 | Nickel-65 | D, see ⁵⁶ Ni | 8E+3 | 2E+4 | 1E-5 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ⁵⁶ Ni | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| | | Vapor | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 28 | Nickel-66 | D, see ⁵⁶ Ni | 4E+2 | 2E+3 | 7E-7 | 2E-9 | - | - |
| | | LLI wall | (5E+2) | - | - | - | 6E-6 | 6E-5 |
| | | W, see ⁵⁶ Ni | - | 6E+2 | 3E-7 | 9E-10 | - | - |
| | | Vapor | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 29 | Copper-60 ² | D, all compounds except those given for W and Y | 3E+4 | 9E+4 | 4E-5 | 1E-7 | - | - |
| | | St wall | (3E+4) | - | - | - | 4E-4 | 4E-3 |
| | | W, sulfides, halides, and nitrates | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | Y, oxides and hydroxides | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 29 | Copper-61 | D, see ⁶⁰ Cu | 1E+4 | 3E+4 | 1E-5 | 4E-8 | 2E-4 | 2E-3 |
| | | W, see ⁶⁰ Cu | - | 4E+4 | 2E-5 | 6E-8 | - | - |
| | | Y, see ⁶⁰ Cu | - | 4E+4 | 1E-5 | 5E-8 | - | - |
| 29 | Copper-64 | D, see ⁶⁰ Cu | 1E+4 | 3E+4 | 1E-5 | 4E-8 | 2E-4 | 2E-3 |
| | | W, see ⁶⁰ Cu | - | 2E+4 | 1E-5 | 3E-8 | - | - |
| | | Y, see ⁶⁰ Cu | - | 2E+4 | 9E-6 | 3E-8 | - | - |
| 29 | Copper-67 | D, see ⁶⁰ Cu | 5E+3 | 8E+3 | 3E-6 | 1E-8 | 6E-5 | 6E-4 |
| | | W, see ⁶⁰ Cu | - | 5E+3 | 2E-6 | 7E-9 | - | - |
| | | Y, see ⁶⁰ Cu | - | 5E+3 | 2E-6 | 6E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|--|------------|-----------|-------------------------------------|----------------|--|--------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC (μCi/ml) |
| 30 | Zinc-62 | Y, all compounds | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 2E-5 | 2E-4 |
| 30 | Zinc-63 ² | Y, all compounds | 2E+4 | 7E+4 | 3E-5 | 9E-8 | - | - |
| | | | St wall | | | | | |
| | | | (3E+4) | - | - | - | 3E-4 | 3E-3 |
| 30 | Zinc-65 | Y, all compounds | 4E+2 | 3E+2 | 1E-7 | 4E-10 | 5E-6 | 5E-5 |
| 30 | Zinc-69m | Y, all compounds | 4E+3 | 7E+3 | 3E-6 | 1E-8 | 6E-5 | 6E-4 |
| 30 | Zinc-69 ² | Y, all compounds | 6E+4 | 1E+5 | 6E-5 | 2E-7 | 8E-4 | 8E-3 |
| 30 | Zinc-71m | Y, all compounds | 6E+3 | 2E+4 | 7E-6 | 2E-8 | 8E-5 | 8E-4 |
| 30 | Zinc-72 | Y, all compounds | 1E+3 | 1E+3 | 5E-7 | 2E-9 | 1E-5 | 1E-4 |
| 31 | Gallium-65 ² | D, all compounds except those given for W | 5E+4 | 2E+5 | 7E-5 | 2E-7 | - | - |
| | | | St wall | | | | | |
| | | | (6E+4) | - | - | - | 9E-4 | 9E-3 |
| | | W, oxides, hydroxides, carbides, halides, and nitrates | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 31 | Gallium-66 | D, see ⁶⁵ Ga | 1E+3 | 4E+3 | 1E-6 | 5E-9 | 1E-5 | 1E-4 |
| | | W, see ⁶⁵ Ga | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 31 | Gallium-67 | D, see ⁶⁵ Ga | 7E+3 | 1E+4 | 6E-6 | 2E-8 | 1E-4 | 1E-3 |
| | | W, see ⁶⁵ Ga | - | 1E+4 | 4E-6 | 1E-8 | - | - |
| 31 | Gallium-68 ² | D, see ⁶⁵ Ga | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | | W, see ⁶⁵ Ga | - | 5E+4 | 2E-5 | 7E-8 | - | - |
| 31 | Gallium-70 ² | D, see ⁶⁵ Ga | 5E+4 | 2E+5 | 7E-5 | 2E-7 | - | - |
| | | | St wall | | | | | |
| | | | (7E+4) | - | - | - | 1E-3 | 1E-2 |
| | | W, see ⁶⁵ Ga | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 31 | Gallium-72 | D, see ⁶⁵ Ga | 1E+3 | 4E+3 | 1E-6 | 5E-9 | 2E-5 | 2E-4 |
| | | W, see ⁶⁵ Ga | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 31 | Gallium-73 | D, see ⁶⁵ Ga | 5E+3 | 2E+4 | 6E-6 | 2E-8 | 7E-5 | 7E-4 |
| | | W, see ⁶⁵ Ga | - | 2E+4 | 6E-6 | 2E-8 | - | - |
| 32 | Germanium-66 | D, all compounds except those given for W | 2E+4 | 3E+4 | 1E-5 | 4E-8 | 3E-4 | 3E-3 |
| | | W, oxides, sulfides, and halides | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 32 | Germanium-67 ² | D, see ⁶⁶ Ge | 3E+4 | 9E+4 | 4E-5 | 1E-7 | - | - |
| | | | St wall | | | | | |
| | | | (4E+4) | - | - | - | 6E-4 | 6E-3 |
| | | W, see ⁶⁶ Ge | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 32 | Germanium-68 | D, see ⁶⁶ Ge | 5E+3 | 4E+3 | 2E-6 | 5E-9 | 6E-5 | 6E-4 |
| | | W, see ⁶⁶ Ge | - | 1E+2 | 4E-8 | 1E-10 | - | - |
| 32 | Germanium-69 | D, see ⁶⁶ Ge | 1E+4 | 2E+4 | 6E-6 | 2E-8 | 2E-4 | 2E-3 |
| | | W, see ⁶⁶ Ge | - | 8E+3 | 3E-6 | 1E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|---|--------|-------------------------------------|--------------------------------|---|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| 32 | Germanium-71 | D, see ⁶⁶ Ge | 5E+5 | 4E+5 | 2E-4 | 6E-7 | 7E-3 | 7E-2 |
| | | W, see ⁶⁶ Ge | - | 4E+4 | 2E-5 | 6E-8 | - | - |
| 32 | Germanium-75 ² | D, see ⁶⁶ Ge | 4E+4 | 8E+4 | 3E-5 | 1E-7 | - | - |
| | | St wall | (7E+4) | - | - | - | 9E-4 | 9E-3 |
| | | W, see ⁶⁶ Ge | - | 8E+4 | 4E-5 | 1E-7 | - | - |
| 32 | Germanium-77 | D, see ⁶⁶ Ge | 9E+3 | 1E+4 | 4E-6 | 1E-8 | 1E-4 | 1E-3 |
| | | W, see ⁶⁶ Ge | - | 6E+3 | 2E-6 | 8E-9 | - | - |
| 32 | Germanium-78 ² | D, see ⁶⁶ Ge | 2E+4 | 2E+4 | 9E-6 | 3E-8 | - | - |
| | | St wall | (2E+4) | - | - | - | 3E-4 | 3E-3 |
| | | W, see ⁶⁶ Ge | - | 2E+4 | 9E-6 | 3E-8 | - | - |
| 33 | Arsenic-69 ² | W, all compounds | 3E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | St wall | (4E+4) | - | - | - | 6E-4 | 6E-3 |
| 33 | Arsenic-70 ² | W, all compounds | 1E+4 | 5E+4 | 2E-5 | 7E-8 | 2E-4 | 2E-3 |
| 33 | Arsenic-71 | W, all compounds | 4E+3 | 5E+3 | 2E-6 | 6E-9 | 5E-5 | 5E-4 |
| 33 | Arsenic-72 | W, all compounds | 9E+2 | 1E+3 | 6E-7 | 2E-9 | 1E-5 | 1E-4 |
| 33 | Arsenic-73 | W, all compounds | 8E+3 | 2E+3 | 7E-7 | 2E-9 | 1E-4 | 1E-3 |
| 33 | Arsenic-74 | W, all compounds | 1E+3 | 8E+2 | 3E-7 | 1E-9 | 2E-5 | 2E-4 |
| 33 | Arsenic-76 | W, all compounds | 1E+3 | 1E+3 | 6E-7 | 2E-9 | 1E-5 | 1E-4 |
| 33 | Arsenic-77 | W, all compounds | 4E+3 | 5E+3 | 2E-6 | 7E-9 | - | - |
| | | LLI wall | (5E+3) | - | - | - | 6E-5 | 6E-4 |
| 33 | Arsenic-78 ² | W, all compounds | 8E+3 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| 34 | Selenium-70 ² | D, all compounds except those given for W | 2E+4 | 4E+4 | 2E-5 | 5E-8 | 1E-4 | 1E-3 |
| | | W, oxides, hydroxides, carbides, and elemental Se | 1E+4 | 4E+4 | 2E-5 | 6E-8 | - | - |
| 34 | Selenium-73m ² | D, see ⁷⁰ Se | 6E+4 | 2E+5 | 6E-5 | 2E-7 | 4E-4 | 4E-3 |
| | | W, see ⁷⁰ Se | 3E+4 | 1E+5 | 6E-5 | 2E-7 | - | - |
| 34 | Selenium-73 | D, see ⁷⁰ Se | 3E+3 | 1E+4 | 5E-6 | 2E-8 | 4E-5 | 4E-4 |
| | | W, see ⁷⁰ Se | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 34 | Selenium-75 | D, see ⁷⁰ Se | 5E+2 | 7E+2 | 3E-7 | 1E-9 | 7E-6 | 7E-5 |
| | | W, see ⁷⁰ Se | - | 6E+2 | 3E-7 | 8E-10 | - | - |
| 34 | Selenium-79 | D, see ⁷⁰ Se | 6E+2 | 8E+2 | 3E-7 | 1E-9 | 8E-6 | 8E-5 |
| | | W, see ⁷⁰ Se | - | 6E+2 | 2E-7 | 8E-10 | - | - |
| 34 | Selenium-81m ² | D, see ⁷⁰ Se | 4E+4 | 7E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| | | W, see ⁷⁰ Se | 2E+4 | 7E+4 | 3E-5 | 1E-7 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|--------------------------|--|---|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 34 | Selenium-81 ² | D, see ⁷⁰ Se | 6E+4 | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | St wall | (8E+4) | - | - | - | 1E-3 | 1E-2 |
| | | W, see ⁷⁰ Se | - | 2E+5 | 1E-4 | 3E-7 | - | - |
| 34 | Selenium-83 ² | D, see ⁷⁰ Se | 4E+4 | 1E+5 | 5E-5 | 2E-7 | 4E-4 | 4E-3 |
| | | W, see ⁷⁰ Se | 3E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| 35 | Bromine-74m ² | D, bromides of H, Li, Na, K, Rb, Cs, and Fr | 1E+4 | 4E+4 | 2E-5 | 5E-8 | - | - |
| | | St wall | (2E+4) | - | - | - | 3E-4 | 3E-3 |
| | | W, bromides of lanthanides, Be, Mg, Ca, Sr, Ba, Ra, Al, Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Sc, Y, Ti, Zr, Hf, V, Nb, Ta, Mn, Tc, and Re | - | 4E+4 | 2E-5 | 6E-8 | - | - |
| 35 | Bromine-74 ² | D, see ^{74m} Br | 2E+4 | 7E+4 | 3E-5 | 1E-7 | - | - |
| | | St wall | (4E+4) | - | - | - | 5E-4 | 5E-3 |
| | | W, see ^{74m} Br | - | 8E+4 | 4E-5 | 1E-7 | - | - |
| 35 | Bromine-75 ² | D, see ^{74m} Br | 3E+4 | 5E+4 | 2E-5 | 7E-8 | - | - |
| | | St wall | (4E+4) | - | - | - | 5E-4 | 5E-3 |
| | | W, see ^{74m} Br | - | 5E+4 | 2E-5 | 7E-8 | - | - |
| 35 | Bromine-76 | D, see ^{74m} Br | 4E+3 | 5E+3 | 2E-6 | 7E-9 | 5E-5 | 5E-4 |
| | | W, see ^{74m} Br | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| 35 | Bromine-77 | D, see ^{74m} Br | 2E+4 | 2E+4 | 1E-5 | 3E-8 | 2E-4 | 2E-3 |
| | | W, see ^{74m} Br | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 35 | Bromine-80m | D, see ^{74m} Br | 2E+4 | 2E+4 | 7E-6 | 2E-8 | 3E-4 | 3E-3 |
| | | W, see ^{74m} Br | - | 1E+4 | 6E-6 | 2E-8 | - | - |
| 35 | Bromine-80 ² | D, see ^{74m} Br | 5E+4 | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | St wall | (9E+4) | - | - | - | 1E-3 | 1E-2 |
| | | W, see ^{74m} Br | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| 35 | Bromine-82 | D, see ^{74m} Br | 3E+3 | 4E+3 | 2E-6 | 6E-9 | 4E-5 | 4E-4 |
| | | W, see ^{74m} Br | - | 4E+3 | 2E-6 | 5E-9 | - | - |
| 35 | Bromine-83 | D, see ^{74m} Br | 5E+4 | 6E+4 | 3E-5 | 9E-8 | - | - |
| | | St wall | (7E+4) | - | - | - | 9E-4 | 9E-3 |
| | | W, see ^{74m} Br | - | 6E+4 | 3E-5 | 9E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|------------------------------|---|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 35 Bromine-84 ² | D, see ^{74m} Br | 2E+4 | 6E+4 | 2E-5 | 8E-8 | - | - |
| | | St wall (3E+4) | - | - | - | 4E-4 | 4E-3 |
| | W, see ^{74m} Br | - | 6E+4 | 3E-5 | 9E-8 | - | - |
| 36 Krypton-74 ² | Submersion ¹ | - | - | 3E-6 | 1E-8 | - | - |
| 36 Krypton-76 | Submersion ¹ | - | - | 9E-6 | 4E-8 | - | - |
| 36 Krypton-77 ² | Submersion ¹ | - | - | 4E-6 | 2E-8 | - | - |
| 36 Krypton-79 | Submersion ¹ | - | - | 2E-5 | 7E-8 | - | - |
| 36 Krypton-81 | Submersion ¹ | - | - | 7E-4 | 3E-6 | - | - |
| 36 Krypton-83m ² | Submersion ¹ | - | - | 1E-2 | 5E-5 | - | - |
| 36 Krypton-85m | Submersion ¹ | - | - | 2E-5 | 1E-7 | - | - |
| 36 Krypton-85 | Submersion ¹ | - | - | 1E-4 | 7E-7 | - | - |
| 36 Krypton-87 ² | Submersion ¹ | - | - | 5E-6 | 2E-8 | - | - |
| 36 Krypton-88 | Submersion ¹ | - | - | 2E-6 | 9E-9 | - | - |
| 37 Rubidium-79 ² | D, all compounds | 4E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | St wall (6E+4) | - | - | - | 8E-4 | 8E-3 |
| 37 Rubidium-81m ² | D, all compounds | 2E+5 | 3E+5 | 1E-4 | 5E-7 | - | - |
| | | St wall (3E+5) | - | - | - | 4E-3 | 4E-2 |
| 37 Rubidium-81 | D, all compounds | 4E+4 | 5E+4 | 2E-5 | 7E-8 | 5E-4 | 5E-3 |
| 37 Rubidium-82m | D, all compounds | 1E+4 | 2E+4 | 7E-6 | 2E-8 | 2E-4 | 2E-3 |
| 37 Rubidium-83 | D, all compounds | 6E+2 | 1E+3 | 4E-7 | 1E-9 | 9E-6 | 9E-5 |
| 37 Rubidium-84 | D, all compounds | 5E+2 | 8E+2 | 3E-7 | 1E-9 | 7E-6 | 7E-5 |
| 37 Rubidium-86 | D, all compounds | 5E+2 | 8E+2 | 3E-7 | 1E-9 | 7E-6 | 7E-5 |
| 37 Rubidium-87 | D, all compounds | 1E+3 | 2E+3 | 6E-7 | 2E-9 | 1E-5 | 1E-4 |
| 37 Rubidium-88 ² | D, all compounds | 2E+4 | 6E+4 | 3E-5 | 9E-8 | - | - |
| | | St wall (3E+4) | - | - | - | 4E-4 | 4E-3 |
| 37 Rubidium-89 ² | D, all compounds | 4E+4 | 1E+5 | 6E-5 | 2E-7 | - | - |
| | | St wall (6E+4) | - | - | - | 9E-4 | 9E-3 |
| 38 Strontium-80 ² | D, all soluble compounds except SrTiO Y, all insoluble compounds and SrTiO | 4E+3 | 1E+4 | 5E-6 | 2E-8 | 6E-5 | 6E-4 |
| | | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 38 Strontium-81 ² | D, see ⁸⁰ Sr Y, see ⁸⁰ Sr | 3E+4 | 8E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 |
| | | 2E+4 | 8E+4 | 3E-5 | 1E-7 | - | - |
| 38 Strontium-82 | D, see ⁸⁰ Sr LLI wall Y, see ⁸⁰ Sr | 3E+2 | 4E+2 | 2E-7 | 6E-10 | - | - |
| | | (2E+2) | - | - | - | 3E-6 | 3E-5 |
| | | 2E+2 | 9E+1 | 4E-8 | 1E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|----------------------------|---|---|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 38 | Strontium-83 | D, see ⁸⁰ Sr | 3E+3 | 7E+3 | 3E-6 | 1E-8 | 3E-5 | 3E-4 |
| | | Y, see ⁸⁰ Sr | 2E+3 | 4E+3 | 1E-6 | 5E-9 | - | - |
| 38 | Strontium-85m ² | D, see ⁸⁰ Sr | 2E+5 | 6E+5 | 3E-4 | 9E-7 | 3E-3 | 3E-2 |
| | | Y, see ⁸⁰ Sr | - | 8E+5 | 4E-4 | 1E-6 | - | - |
| 38 | Strontium-85 | D, see ⁸⁰ Sr | 3E+3 | 3E+3 | 1E-6 | 4E-9 | 4E-5 | 4E-4 |
| | | Y, see ⁸⁰ Sr | - | 2E+3 | 6E-7 | 2E-9 | - | - |
| 38 | Strontium-87m | D, see ⁸⁰ Sr | 5E+4 | 1E+5 | 5E-5 | 2E-7 | 6E-4 | 6E-3 |
| | | Y, see ⁸⁰ Sr | 4E+4 | 2E+5 | 6E-5 | 2E-7 | - | - |
| 38 | Strontium-89 | D, see ⁸⁰ Sr | 6E+2 | 8E+2 | 4E-7 | 1E-9 | - | - |
| | | LLI wall | (6E+2) | - | - | - | 8E-6 | 8E-5 |
| | | Y, see ⁸⁰ Sr | 5E+2 | 1E+2 | 6E-8 | 2E-10 | - | - |
| 38 | Strontium-90 | D, see ⁸⁰ Sr | 3E+1 | 2E+1 | 8E-9 | - | - | - |
| | | Bone surf | (4E+1) | (2E+1) | - | 3E-11 | 5E-7 | 5E-6 |
| | | Y, see ⁸⁰ Sr | - | 4E+0 | 2E-9 | 6E-12 | - | - |
| 38 | Strontium-91 | D, see ⁸⁰ Sr | 2E+3 | 6E+3 | 2E-6 | 8E-9 | 2E-5 | 2E-4 |
| | | Y, see ⁸⁰ Sr | - | 4E+3 | 1E-6 | 5E-9 | - | - |
| 38 | Strontium-92 | D, see ⁸⁰ Sr | 3E+3 | 9E+3 | 4E-6 | 1E-8 | 4E-5 | 4E-4 |
| | | Y, see ⁸⁰ Sr | - | 7E+3 | 3E-6 | 9E-9 | - | - |
| 39 | Yttrium-86m ² | W, all compounds except those given for Y | 2E+4 | 6E+4 | 2E-5 | 8E-8 | 3E-4 | 3E-3 |
| | | Y, oxides and hydroxides | - | 5E+4 | 2E-5 | 8E-8 | - | - |
| 39 | Yttrium-86 | W, see ^{86m} Y | 1E+3 | 3E+3 | 1E-6 | 5E-9 | 2E-5 | 2E-4 |
| | | Y, see ^{86m} Y | - | 3E+3 | 1E-6 | 5E-9 | - | - |
| 39 | Yttrium-87 | W, see ^{86m} Y | 2E+3 | 3E+3 | 1E-6 | 5E-9 | 3E-5 | 3E-4 |
| | | Y, see ^{86m} Y | - | 3E+3 | 1E-6 | 5E-9 | - | - |
| 39 | Yttrium-88 | W, see ^{86m} Y | 1E+3 | 3E+2 | 1E-7 | 3E-10 | 1E-5 | 1E-4 |
| | | Y, see ^{86m} Y | - | 2E+2 | 1E-7 | 3E-10 | - | - |
| 39 | Yttrium-90m | W, see ^{86m} Y | 8E+3 | 1E+4 | 5E-6 | 2E-8 | 1E-4 | 1E-3 |
| | | Y, see ^{86m} Y | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 39 | Yttrium-90 | W, see ^{86m} Y | 4E+2 | 7E+2 | 3E-7 | 9E-10 | - | - |
| | | LLI wall | (5E+2) | - | - | - | 7E-6 | 7E-5 |
| | | Y, see ^{86m} Y | - | 6E+2 | 3E-7 | 9E-10 | - | - |
| 39 | Yttrium-91m ² | W, see ^{86m} Y | 1E+5 | 2E+5 | 1E-4 | 3E-7 | 2E-3 | 2E-2 |
| | | Y, see ^{86m} Y | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| 39 | Yttrium-91 | W, see ^{86m} Y | 5E+2 | 2E+2 | 7E-8 | 2E-10 | - | - |
| | | LLI wall | (6E+2) | - | - | - | 8E-6 | 8E-5 |
| | | Y, see ^{86m} Y | - | 1E+2 | 5E-8 | 2E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|----------------------------|---|--------------------------------|-------------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 39 Yttrium-92 | W, see ^{86m} Y | 3E+3 | 9E+3 | 4E-6 | 1E-8 | 4E-5 | 4E-4 |
| | Y, see ^{86m} Y | - | 8E+3 | 3E-6 | 1E-8 | - | - |
| 39 Yttrium-93 | W, see ^{86m} Y | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 2E-5 | 2E-4 |
| | Y, see ^{86m} Y | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 39 Yttrium-94 ² | W, see ^{86m} Y | 2E+4 St wall | 8E+4 | 3E-5 | 1E-7 | - | - |
| | | (3E+4) | - | - | - | 4E-4 | 4E-3 |
| 39 Yttrium-95 ² | Y, see ^{86m} Y | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| | W, see ^{86m} Y | 4E+4 St wall | 2E+5 | 6E-5 | 2E-7 | - | - |
| | | (5E+4) | - | - | - | 7E-4 | 7E-3 |
| 40 Zirconium-86 | Y, see ^{86m} Y | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| | D, all compounds except those given for W and Y | 1E+3 | 4E+3 | 2E-6 | 6E-9 | 2E-5 | 2E-4 |
| | W, oxides, hydroxides, halides, and nitrates | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| | Y, carbide | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 40 Zirconium-88 | D, see ⁸⁶ Zr | 4E+3 | 2E+2 | 9E-8 | 3E-10 | 5E-5 | 5E-4 |
| | W, see ⁸⁶ Zr | - | 5E+2 | 2E-7 | 7E-10 | - | - |
| | Y, see ⁸⁶ Zr | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 40 Zirconium-89 | D, see ⁸⁶ Zr | 2E+3 | 4E+3 | 1E-6 | 5E-9 | 2E-5 | 2E-4 |
| | W, see ⁸⁶ Zr | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| | Y, see ⁸⁶ Zr | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 40 Zirconium-93 | D, see ⁸⁶ Zr | 1E+3 Bone surf | 6E+0 Bone surf | 3E-9 | - | - | - |
| | | (3E+3) | (2E+1) | - | 2E-11 | 4E-5 | 4E-4 |
| | W, see ⁸⁶ Zr | - | 2E+1 Bone surf | 1E-8 | - | - | - |
| | | - | (6E+1) | - | 9E-11 | - | - |
| | Y, see ⁸⁶ Zr | - | 6E+1 Bone surf | 2E-8 | - | - | - |
| | | - | (7E+1) | - | 9E-11 | - | - |
| 40 Zirconium-95 | D, see ⁸⁶ Zr | 1E+3 | 1E+2 Bone surf | 5E-8 | - | 2E-5 | 2E-4 |
| | | - | (3E+2) | - | 4E-10 | - | - |
| | W, see ⁸⁶ Zr | - | 4E+2 | 2E-7 | 5E-10 | - | - |
| | Y, see ⁸⁶ Zr | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 40 Zirconium-97 | D, see ⁸⁶ Zr | 6E+2 | 2E+3 | 8E-7 | 3E-9 | 9E-6 | 9E-5 |
| | W, see ⁸⁶ Zr | - | 1E+3 | 6E-7 | 2E-9 | - | - |
| | Y, see ⁸⁶ Zr | - | 1E+3 | 5E-7 | 2E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--|---|--------------------------------|---------------------------|---------------------------|-------------------------------------|--------------------------------|---|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) |
| | | Oral Ingestion | INHALATION | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 41 Niobium-88 ² | W, all compounds except those given for Y | 5E+4 St wall | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | (7E+4) | - | - | - | 1E-3 | 1E-2 |
| | Y, oxides and hydroxides | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| 41 Niobium-89 ² (66 min) | W, see ⁸⁸ Nb | 1E+4 | 4E+4 | 2E-5 | 6E-8 | 1E-4 | 1E-3 |
| | Y, see ⁸⁸ Nb | - | 4E+4 | 2E-5 | 5E-8 | - | - |
| 41 Niobium-89 (122 min) | W, see ⁸⁸ Nb | 5E+3 | 2E+4 | 8E-6 | 3E-8 | 7E-5 | 7E-4 |
| | Y, see ⁸⁸ Nb | - | 2E+4 | 6E-6 | 2E-8 | - | - |
| 41 Niobium-90 | W, see ⁸⁸ Nb | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 1E-5 | 1E-4 |
| | Y, see ⁸⁸ Nb | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 41 Niobium-93m | W, see ⁸⁸ Nb | 9E+3 | 2E+3 | 8E-7 | 3E-9 | - | - |
| | | LLI wall (1E+4) | - | - | - | 2E-4 | 2E-3 |
| | Y, see ⁸⁸ Nb | - | 2E+2 | 7E-8 | 2E-10 | - | - |
| 41 Niobium-94 | W, see ⁸⁸ Nb | 9E+2 | 2E+2 | 8E-8 | 3E-10 | 1E-5 | 1E-4 |
| | Y, see ⁸⁸ Nb | - | 2E+1 | 6E-9 | 2E-11 | - | - |
| 41 Niobium-95m | W, see ⁸⁸ Nb | 2E+3 | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | LLI wall (2E+3) | - | - | - | 3E-5 | 3E-4 |
| | Y, see ⁸⁸ Nb | - | 2E+3 | 9E-7 | 3E-9 | - | - |
| 41 Niobium-95 | W, see ⁸⁸ Nb | 2E+3 | 1E+3 | 5E-7 | 2E-9 | 3E-5 | 3E-4 |
| | Y, see ⁸⁸ Nb | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 41 Niobium-96 | W, see ⁸⁸ Nb | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 2E-5 | 2E-4 |
| | Y, see ⁸⁸ Nb | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 41 Niobium-97 ² | W, see ⁸⁸ Nb | 2E+4 | 8E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 |
| | Y, see ⁸⁸ Nb | - | 7E+4 | 3E-5 | 1E-7 | - | - |
| 41 Niobium-98 ² | W, see ⁸⁸ Nb | 1E+4 | 5E+4 | 2E-5 | 8E-8 | 2E-4 | 2E-3 |
| | Y, see ⁸⁸ Nb | - | 5E+4 | 2E-5 | 7E-8 | - | - |
| 42 Molybdenum-90 | D, all compounds except those given for Y | 4E+3 | 7E+3 | 3E-6 | 1E-8 | 3E-5 | 3E-4 |
| | Y, oxides, hydroxides, and MoS | 2E+3 | 5E+3 | 2E-6 | 6E-9 | - | - |
| 42 Molybdenum-93m | D, see ⁹⁰ Mo | 9E+3 | 2E+4 | 7E-6 | 2E-8 | 6E-5 | 6E-4 |
| | Y, see ⁹⁰ Mo | 4E+3 | 1E+4 | 6E-6 | 2E-8 | - | - |
| 42 Molybdenum-93 | D, see ⁹⁰ Mo | 4E+3 | 5E+3 | 2E-6 | 8E-9 | 5E-5 | 5E-4 |
| | Y, see ⁹⁰ Mo | 2E+4 | 2E+2 | 8E-8 | 2E-10 | - | - |
| 42 Molybdenum-99 | D, see ⁹⁰ Mo | 2E+3 | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | LLI wall (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | Y, see ⁹⁰ Mo | 1E+3 | 1E+3 | 6E-7 | 2E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-----------------------------|--|---------------------------|-----------|-------------------------------------|----------------|--|--------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC (μCi/ml) |
| 42 | Molybdenum-101 ² | D, see ⁹⁰ Mo | 4E+4 St wall (5E+4) | 1E+5 | 6E-5 | 2E-7 | - | - |
| | | Y, see ⁹⁰ Mo | - | 1E+5 | 6E-5 | 2E-7 | - | 7E-4 |
| 43 | Technetium-93m ² | D, all compounds except those given for W | 7E+4 | 2E+5 | 6E-5 | 2E-7 | 1E-3 | 1E-2 |
| | | W, oxides, hydroxides, halides, and nitrates | - | 3E+5 | 1E-4 | 4E-7 | - | - |
| 43 | Technetium-93 | D, see ^{93m} Tc | 3E+4 | 7E+4 | 3E-5 | 1E-7 | 4E-4 | 4E-3 |
| | | W, see ^{93m} Tc | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 43 | Technetium-94m ² | D, see ^{93m} Tc | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 3E-4 | 3E-3 |
| | | W, see ^{93m} Tc | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| 43 | Technetium-94 | D, see ^{93m} Tc | 9E+3 | 2E+4 | 8E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ^{93m} Tc | - | 2E+4 | 1E-5 | 3E-8 | - | - |
| 43 | Technetium-95m | D, see ^{93m} Tc | 4E+3 | 5E+3 | 2E-6 | 8E-9 | 5E-5 | 5E-4 |
| | | W, see ^{93m} Tc | - | 2E+3 | 8E-7 | 3E-9 | - | - |
| 43 | Technetium-95 | D, see ^{93m} Tc | 1E+4 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ^{93m} Tc | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 43 | Technetium-96m ² | D, see ^{93m} Tc | 2E+5 | 3E+5 | 1E-4 | 4E-7 | 2E-3 | 2E-2 |
| | | W, see ^{93m} Tc | - | 2E+5 | 1E-4 | 3E-7 | - | - |
| 43 | Technetium-96 | D, see ^{93m} Tc | 2E+3 | 3E+3 | 1E-6 | 5E-9 | 3E-5 | 3E-4 |
| | | W, see ^{93m} Tc | - | 2E+3 | 9E-7 | 3E-9 | - | - |
| 43 | Technetium-97m | D, see ^{93m} Tc | 5E+3 St wall (7E+3) | 7E+3 | 3E-6 | - | 6E-5 | 6E-4 |
| | | W, see ^{93m} Tc | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 43 | Technetium-97 | D, see ^{93m} Tc | 4E+4 | 5E+4 | 2E-5 | 7E-8 | 5E-4 | 5E-3 |
| | | W, see ^{93m} Tc | - | 6E+3 | 2E-6 | 8E-9 | - | - |
| 43 | Technetium-98 | D, see ^{93m} Tc | 1E+3 | 2E+3 | 7E-7 | 2E-9 | 1E-5 | 1E-4 |
| | | W, see ^{93m} Tc | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 43 | Technetium-99m | D, see ^{93m} Tc | 8E+4 | 2E+5 | 6E-5 | 2E-7 | 1E-3 | 1E-2 |
| | | W, see ^{93m} Tc | - | 2E+5 | 1E-4 | 3E-7 | - | - |
| 43 | Technetium-99 | D, see ^{93m} Tc | 4E+3 St wall (6E+3) | 5E+3 | 2E-6 | - | 6E-5 | 6E-4 |
| | | W, see ^{93m} Tc | - | 7E+2 | 3E-7 | 9E-10 | - | - |
| 43 | Technetium-101 ² | D, see ^{93m} Tc | 9E+4 St wall (1E+5) | 3E+5 | 1E-4 | 5E-7 | - | - |
| | | W, see ^{93m} Tc | - | 4E+5 | 2E-4 | 5E-7 | 2E-3 | 2E-2 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-----------------------------|---|------------|--------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | ALI (μCi) | ALI (μCi) | DAC (μCi/ml) | | | | |
| 43 | Technetium-104 ² | D, see ^{93m} Tc | 2E+4 | 7E+4 | 3E-5 | 1E-7 | - | - |
| | | St wall | (3E+4) | - | - | - | 4E-4 | 4E-3 |
| | | W, see ^{93m} Tc | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 44 | Ruthenium-94 ² | D, all compounds except those given for W and Y | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | | W, halides | - | 6E+4 | 3E-5 | 9E-8 | - | - |
| | | Y, oxides and hydroxides | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| 44 | Ruthenium-97 | D, see ⁹⁴ Ru | 8E+3 | 2E+4 | 8E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ⁹⁴ Ru | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| | | Y, see ⁹⁴ Ru | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 44 | Ruthenium-103 | D, see ⁹⁴ Ru | 2E+3 | 2E+3 | 7E-7 | 2E-9 | 3E-5 | 3E-4 |
| | | W, see ⁹⁴ Ru | - | 1E+3 | 4E-7 | 1E-9 | - | - |
| | | Y, see ⁹⁴ Ru | - | 6E+2 | 3E-7 | 9E-10 | - | - |
| 44 | Ruthenium-105 | D, see ⁹⁴ Ru | 5E+3 | 1E+4 | 6E-6 | 2E-8 | 7E-5 | 7E-4 |
| | | W, see ⁹⁴ Ru | - | 1E+4 | 6E-6 | 2E-8 | - | - |
| | | Y, see ⁹⁴ Ru | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 44 | Ruthenium-106 | D, see ⁹⁴ Ru | 2E+2 | 9E+1 | 4E-8 | 1E-10 | - | - |
| | | LLI wall | (2E+2) | - | - | - | 3E-6 | 3E-5 |
| | | W, see ⁹⁴ Ru | - | 5E+1 | 2E-8 | 8E-11 | - | - |
| | | Y, see ⁹⁴ Ru | - | 1E+1 | 5E-9 | 2E-11 | - | - |
| 45 | Rhodium-99m | D, all compounds except those given for W and Y | 2E+4 | 6E+4 | 2E-5 | 8E-8 | 2E-4 | 2E-3 |
| | | W, halides | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| | | Y, oxides and hydroxides | - | 7E+4 | 3E-5 | 9E-8 | - | - |
| 45 | Rhodium-99 | D, see ^{99m} Rh | 2E+3 | 3E+3 | 1E-6 | 4E-9 | 3E-5 | 3E-4 |
| | | W, see ^{99m} Rh | - | 2E+3 | 9E-7 | 3E-9 | - | - |
| | | Y, see ^{99m} Rh | - | 2E+3 | 8E-7 | 3E-9 | - | - |
| 45 | Rhodium-100 | D, see ^{99m} Rh | 2E+3 | 5E+3 | 2E-6 | 7E-9 | 2E-5 | 2E-4 |
| | | W, see ^{99m} Rh | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| | | Y, see ^{99m} Rh | - | 4E+3 | 2E-6 | 5E-9 | - | - |
| 45 | Rhodium-101m | D, see ^{99m} Rh | 6E+3 | 1E+4 | 5E-6 | 2E-8 | 8E-5 | 8E-4 |
| | | W, see ^{99m} Rh | - | 8E+3 | 4E-6 | 1E-8 | - | - |
| | | Y, see ^{99m} Rh | - | 8E+3 | 3E-6 | 1E-8 | - | - |
| 45 | Rhodium-101 | D, see ^{99m} Rh | 2E+3 | 5E+2 | 2E-7 | 7E-10 | 3E-5 | 3E-4 |
| | | W, see ^{99m} Rh | - | 8E+2 | 3E-7 | 1E-9 | - | - |
| | | Y, see ^{99m} Rh | - | 2E+2 | 6E-8 | 2E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|---|--------|-------------------------------------|-----------------------------|---|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| 45 | Rhodium-102m | D, see ^{99m} Rh | 1E+3 | 5E+2 | 2E-7 | 7E-10 | - | - |
| | | | LLI wall | | | | | |
| | | | (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | W, see ^{99m} Rh | - | 4E+2 | 2E-7 | 5E-10 | - | - |
| | | Y, see ^{99m} Rh | - | 1E+2 | 5E-8 | 2E-10 | - | - |
| 45 | Rhodium-102 | D, see ^{99m} Rh | 6E+2 | 9E+1 | 4E-8 | 1E-10 | 8E-6 | 8E-5 |
| | | W, see ^{99m} Rh | - | 2E+2 | 7E-8 | 2E-10 | - | - |
| | | Y, see ^{99m} Rh | - | 6E+1 | 2E-8 | 8E-11 | - | - |
| 45 | Rhodium-103m ² | D, see ^{99m} Rh | 4E+5 | 1E+6 | 5E-4 | 2E-6 | 6E-3 | 6E-2 |
| | | W, see ^{99m} Rh | - | 1E+6 | 5E-4 | 2E-6 | - | - |
| | | Y, see ^{99m} Rh | - | 1E+6 | 5E-4 | 2E-6 | - | - |
| 45 | Rhodium-105 | D, see ^{99m} Rh | 4E+3 | 1E+4 | 5E-6 | 2E-8 | - | - |
| | | | LLI wall | | | | | |
| | | | (4E+3) | - | - | - | 5E-5 | 5E-4 |
| | | W, see ^{99m} Rh | - | 6E+3 | 3E-6 | 9E-9 | - | - |
| | | Y, see ^{99m} Rh | - | 6E+3 | 2E-6 | 8E-9 | - | - |
| 45 | Rhodium-106m | D, see ^{99m} Rh | 8E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| | | W, see ^{99m} Rh | - | 4E+4 | 2E-5 | 5E-8 | - | - |
| | | Y, see ^{99m} Rh | - | 4E+4 | 1E-5 | 5E-8 | - | - |
| 45 | Rhodium-107 ² | D, see ^{99m} Rh | 7E+4 | 2E+5 | 1E-4 | 3E-7 | - | - |
| | | | St wall | | | | | |
| | | | (9E+4) | - | - | - | 1E-3 | 1E-2 |
| | | W, see ^{99m} Rh | - | 3E+5 | 1E-4 | 4E-7 | - | - |
| | | Y, see ^{99m} Rh | - | 3E+5 | 1E-4 | 3E-7 | - | - |
| 46 | Palladium-100 | D, all compounds except those given for W and Y | 1E+3 | 1E+3 | 6E-7 | 2E-9 | 2E-5 | 2E-4 |
| | | W, nitrates | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| | | Y, oxides and hydroxides | - | 1E+3 | 6E-7 | 2E-9 | - | - |
| 46 | Palladium-101 | D, see ¹⁰⁰ Pd | 1E+4 | 3E+4 | 1E-5 | 5E-8 | 2E-4 | 2E-3 |
| | | W, see ¹⁰⁰ Pd | - | 3E+4 | 1E-5 | 5E-8 | - | - |
| | | Y, see ¹⁰⁰ Pd | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 46 | Palladium-103 | D, see ¹⁰⁰ Pd | 6E+3 | 6E+3 | 3E-6 | 9E-9 | - | - |
| | | | LLI wall | | | | | |
| | | | (7E+3) | - | - | - | 1E-4 | 1E-3 |
| | | W, see ¹⁰⁰ Pd | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| | | Y, see ¹⁰⁰ Pd | - | 4E+3 | 1E-6 | 5E-9 | - | - |
| 46 | Palladium-107 | D, see ¹⁰⁰ Pd | 3E+4 | 2E+4 | 9E-6 | - | - | - |
| | | | LLI wall Kidneys | | | | | |
| | | | (4E+4) | (2E+4) | - | 3E-8 | 5E-4 | 5E-3 |
| | | W, see ¹⁰⁰ Pd | - | 7E+3 | 3E-6 | 1E-8 | - | - |
| | | Y, see ¹⁰⁰ Pd | - | 4E+2 | 2E-7 | 6E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|-----------------------------|---|--------------------------------|---------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 46 Palladium-109 | D, see ¹⁰⁰ Pd | 2E+3 | 6E+3 | 3E-6 | 9E-9 | 3E-5 | 3E-4 |
| | W, see ¹⁰⁰ Pd | - | 5E+3 | 2E-6 | 8E-9 | - | - |
| | Y, see ¹⁰⁰ Pd | - | 5E+3 | 2E-6 | 6E-9 | - | - |
| 47 Silver-102 ² | D, all compounds except those given for W and Y | 5E+4 St wall | 2E+5 | 8E-5 | 2E-7 | - | - |
| | | (6E+4) | - | - | - | 9E-4 | 9E-3 |
| | W, nitrates and sulfides | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| | Y, oxides and hydroxides | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 47 Silver-103 ² | D, see ¹⁰² Ag | 4E+4 | 1E+5 | 4E-5 | 1E-7 | 5E-4 | 5E-3 |
| | W, see ¹⁰² Ag | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| | Y, see ¹⁰² Ag | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 47 Silver-104m ² | D, see ¹⁰² Ag | 3E+4 | 9E+4 | 4E-5 | 1E-7 | 4E-4 | 4E-3 |
| | W, see ¹⁰² Ag | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| | Y, see ¹⁰² Ag | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 47 Silver-104 ² | D, see ¹⁰² Ag | 2E+4 | 7E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 |
| | W, see ¹⁰² Ag | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| | Y, see ¹⁰² Ag | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| 47 Silver-105 | D, see ¹⁰² Ag | 3E+3 | 1E+3 | 4E-7 | 1E-9 | 4E-5 | 4E-4 |
| | W, see ¹⁰² Ag | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| | Y, see ¹⁰² Ag | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| 47 Silver-106m | D, see ¹⁰² Ag | 8E+2 | 7E+2 | 3E-7 | 1E-9 | 1E-5 | 1E-4 |
| | W, see ¹⁰² Ag | - | 9E+2 | 4E-7 | 1E-9 | - | - |
| | Y, see ¹⁰² Ag | - | 9E+2 | 4E-7 | 1E-9 | - | - |
| 47 Silver-106 ² | D, see ¹⁰² Ag | 6E+4 St wall | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | (6E+4) | - | - | - | 9E-4 | 9E-3 |
| | W, see ¹⁰² Ag | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| | Y, see ¹⁰² Ag | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 47 Silver-108m | D, see ¹⁰² Ag | 6E+2 | 2E+2 | 8E-8 | 3E-10 | 9E-6 | 9E-5 |
| | W, see ¹⁰² Ag | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| | Y, see ¹⁰² Ag | - | 2E+1 | 1E-8 | 3E-11 | - | - |
| 47 Silver-110m | D, see ¹⁰² Ag | 5E+2 | 1E+2 | 5E-8 | 2E-10 | 6E-6 | 6E-5 |
| | W, see ¹⁰² Ag | - | 2E+2 | 8E-8 | 3E-10 | - | - |
| | Y, see ¹⁰² Ag | - | 9E+1 | 4E-8 | 1E-10 | - | - |
| 47 Silver-111 | D, see ¹⁰² Ag | 9E+2 LLI wall | 2E+3 Liver | 6E-7 | - | - | - |
| | | (1E+3) | (2E+3) | - | 2E-9 | 2E-5 | 2E-4 |
| | W, see ¹⁰² Ag | - | 9E+2 | 4E-7 | 1E-9 | - | - |
| | Y, see ¹⁰² Ag | - | 9E+2 | 4E-7 | 1E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|-----------------------------|---|--------------------------------|-----------------------------------|--------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (µCi/ml) |
| | | Oral Ingestion ALI (µCi) | INHALATION ALI (µCi) DAC (µCi/ml) | | Air (µCi/ml) | Water (µCi/ml) | |
| 47 Silver-112 | D, see ¹⁰² Ag | 3E+3 | 8E+3 | 3E-6 | 1E-8 | 4E-5 | 4E-4 |
| | W, see ¹⁰² Ag | - | 1E+4 | 4E-6 | 1E-8 | - | - |
| | Y, see ¹⁰² Ag | - | 9E+3 | 4E-6 | 1E-8 | - | - |
| 47 Silver-115 ² | D, see ¹⁰² Ag | 3E+4 St wall (3E+4) | 9E+4 | 4E-5 | 1E-7 | - | - |
| | W, see ¹⁰² Ag | - | 9E+4 | 4E-5 | 1E-7 | - | 4E-4 |
| | Y, see ¹⁰² Ag | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| 48 Cadmium-104 ² | D, all compounds except those given for W and Y | 2E+4 | 7E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| | W, sulfides, halides, and nitrates | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| | Y, oxides and hydroxides | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 48 Cadmium-107 | D, see ¹⁰⁴ Cd | 2E+4 | 5E+4 | 2E-5 | 8E-8 | 3E-4 | 3E-3 |
| | W, see ¹⁰⁴ Cd | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| | Y, see ¹⁰⁴ Cd | - | 5E+4 | 2E-5 | 7E-8 | - | - |
| 48 Cadmium-109 | D, see ¹⁰⁴ Cd | 3E+2 | 4E+1 | 1E-8 | - | - | - |
| | Kidneys | (4E+2) | Kidneys (5E+1) | - | 7E-11 | 6E-6 | 6E-5 |
| | W, see ¹⁰⁴ Cd | - | 1E+2 Kidneys | 5E-8 | - | - | - |
| 48 Cadmium-113m | D, see ¹⁰⁴ Cd | 2E+1 | 2E+0 | 1E-9 | - | - | - |
| | Kidneys | (4E+1) | Kidneys (4E+0) | - | 5E-12 | 5E-7 | 5E-6 |
| | W, see ¹⁰⁴ Cd | - | 8E+0 Kidneys | 4E-9 | - | - | - |
| 48 Cadmium-113 | D, see ¹⁰⁴ Cd | 2E+1 | 2E+0 | 9E-10 | - | - | - |
| | Kidneys | (3E+1) | Kidneys (3E+0) | - | 5E-12 | 4E-7 | 4E-6 |
| | W, see ¹⁰⁴ Cd | - | 8E+0 Kidneys | 3E-9 | - | - | - |
| 48 Cadmium-115m | D, see ¹⁰⁴ Cd | 3E+2 | 5E+1 Kidneys | 2E-8 | - | 4E-6 | 4E-5 |
| | W, see ¹⁰⁴ Cd | - | (8E+1) | - | 1E-10 | - | - |
| | Y, see ¹⁰⁴ Cd | - | 1E+2 | 5E-8 | 2E-10 | - | - |
| 48 Cadmium-115m | D, see ¹⁰⁴ Cd | 3E+2 | 5E+1 Kidneys | 2E-8 | - | 4E-6 | 4E-5 |
| | W, see ¹⁰⁴ Cd | - | (8E+1) | - | 1E-10 | - | - |
| | Y, see ¹⁰⁴ Cd | - | 1E+2 | 5E-8 | 2E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | | |
|--------------------------|---------------------------------------|---|--|-----------|-------------------------------------|----------------|--|--------------|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC (μCi/ml) | |
| 48 | Cadmium-115 | D, see ¹⁰⁴ Cd | 9E+2 | 1E+3 | 6E-7 | 2E-9 | - | - | |
| | | | LLI wall | (1E+3) | - | - | - | 1E-5 | 1E-4 |
| | | | W, see ¹⁰⁴ Cd | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| | | | Y, see ¹⁰⁴ Cd | - | 1E+3 | 6E-7 | 2E-9 | - | - |
| 48 | Cadmium-117m | D, see ¹⁰⁴ Cd | 5E+3 | 1E+4 | 5E-6 | 2E-8 | 6E-5 | 6E-4 | |
| | | | W, see ¹⁰⁴ Cd | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| | | | Y, see ¹⁰⁴ Cd | - | 1E+4 | 6E-6 | 2E-8 | - | - |
| 48 | Cadmium-117 | D, see ¹⁰⁴ Cd | 5E+3 | 1E+4 | 5E-6 | 2E-8 | 6E-5 | 6E-4 | |
| | | | W, see ¹⁰⁴ Cd | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| | | | Y, see ¹⁰⁴ Cd | - | 1E+4 | 6E-6 | 2E-8 | - | - |
| 49 | Indium-109 | D, all compounds except those given for W | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 3E-4 | 3E-3 | |
| | | | W, oxides, hydroxides, halides, and nitrates | - | 6E+4 | 3E-5 | 9E-8 | - | - |
| 49 | Indium-110 ² (69.1 min) | D, see ¹⁰⁹ In | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 | |
| | | | W, see ¹⁰⁹ In | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| 49 | Indium-110 (4.9 h) | D, see ¹⁰⁹ In | 5E+3 | 2E+4 | 7E-6 | 2E-8 | 7E-5 | 7E-4 | |
| | | | W, see ¹⁰⁹ In | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 49 | Indium-111 | D, see ¹⁰⁹ In | 4E+3 | 6E+3 | 3E-6 | 9E-9 | 6E-5 | 6E-4 | |
| | | | W, see ¹⁰⁹ In | - | 6E+3 | 3E-6 | 9E-9 | - | - |
| 49 | Indium-112 ² | D, see ¹⁰⁹ In | 2E+5 | 6E+5 | 3E-4 | 9E-7 | 2E-3 | 2E-2 | |
| | | | W, see ¹⁰⁹ In | - | 7E+5 | 3E-4 | 1E-6 | - | - |
| 49 | Indium-113m ² | D, see ¹⁰⁹ In | 5E+4 | 1E+5 | 6E-5 | 2E-7 | 7E-4 | 7E-3 | |
| | | | W, see ¹⁰⁹ In | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 49 | Indium-114m | D, see ¹⁰⁹ In | 3E+2 | 6E+1 | 3E-8 | 9E-11 | - | - | |
| | | | LLI wall | (4E+2) | - | - | - | 5E-6 | 5E-5 |
| | | | W, see ¹⁰⁹ In | - | 1E+2 | 4E-8 | 1E-10 | - | - |
| 49 | Indium-115m | D, see ¹⁰⁹ In | 1E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 | |
| | | | W, see ¹⁰⁹ In | - | 5E+4 | 2E-5 | 7E-8 | - | - |
| 49 | Indium-115 | D, see ¹⁰⁹ In | 4E+1 | 1E+0 | 6E-10 | 2E-12 | 5E-7 | 5E-6 | |
| | | | W, see ¹⁰⁹ In | - | 5E+0 | 2E-9 | 8E-12 | - | - |
| 49 | Indium-116m ² | D, see ¹⁰⁹ In | 2E+4 | 8E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 | |
| | | | W, see ¹⁰⁹ In | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 49 | Indium-117m ² | D, see ¹⁰⁹ In | 1E+4 | 3E+4 | 1E-5 | 5E-8 | 2E-4 | 2E-3 | |
| | | | W, see ¹⁰⁹ In | - | 4E+4 | 2E-5 | 6E-8 | - | - |
| 49 | Indium-117 ² | D, see ¹⁰⁹ In | 6E+4 | 2E+5 | 7E-5 | 2E-7 | 8E-4 | 8E-3 | |
| | | | W, see ¹⁰⁹ In | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| 49 | Indium-119m ² | D, see ¹⁰⁹ In | 4E+4 | 1E+5 | 5E-5 | 2E-7 | - | - | |
| | | | St wall | (5E+4) | - | - | - | 7E-4 | 7E-3 |
| | | | W, see ¹⁰⁹ In | - | 1E+5 | 6E-5 | 2E-7 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------|---|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 50 Tin-110 | D, all compounds except those given for W | 4E+3 | 1E+4 | 5E-6 | 2E-8 | 5E-5 | 5E-4 |
| | W, sulfides, oxides, hydroxides, halides, nitrates, and stannic phosphate | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 50 Tin-111 ² | D, see ¹¹⁰ Sn | 7E+4 | 2E+5 | 9E-5 | 3E-7 | 1E-3 | 1E-2 |
| | W, see ¹¹⁰ Sn | - | 3E+5 | 1E-4 | 4E-7 | - | - |
| 50 Tin-113 | D, see ¹¹⁰ Sn | 2E+3 | 1E+3 | 5E-7 | 2E-9 | - | - |
| | LLI wall | (2E+3) | - | - | - | 3E-5 | 3E-4 |
| | W, see ¹¹⁰ Sn | - | 5E+2 | 2E-7 | 8E-10 | - | - |
| 50 Tin-117m | D, see ¹¹⁰ Sn | 2E+3 | 1E+3 | 5E-7 | - | - | - |
| | LLI wall | (2E+3) | (2E+3) | - | 3E-9 | 3E-5 | 3E-4 |
| | W, see ¹¹⁰ Sn | - | 1E+3 | 6E-7 | 2E-9 | - | - |
| 50 Tin-119m | D, see ¹¹⁰ Sn | 3E+3 | 2E+3 | 1E-6 | 3E-9 | - | - |
| | LLI wall | (4E+3) | - | - | - | 6E-5 | 6E-4 |
| | W, see ¹¹⁰ Sn | - | 1E+3 | 4E-7 | 1E-9 | - | - |
| 50 Tin-121m | D, see ¹¹⁰ Sn | 3E+3 | 9E+2 | 4E-7 | 1E-9 | - | - |
| | LLI wall | (4E+3) | - | - | - | 5E-5 | 5E-4 |
| | W, see ¹¹⁰ Sn | - | 5E+2 | 2E-7 | 8E-10 | - | - |
| 50 Tin-121 | D, see ¹¹⁰ Sn | 6E+3 | 2E+4 | 6E-6 | 2E-8 | - | - |
| | LLI wall | (6E+3) | - | - | - | 8E-5 | 8E-4 |
| | W, see ¹¹⁰ Sn | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 50 Tin-123m ² | D, see ¹¹⁰ Sn | 5E+4 | 1E+5 | 5E-5 | 2E-7 | 7E-4 | 7E-3 |
| | W, see ¹¹⁰ Sn | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| 50 Tin-123 | D, see ¹¹⁰ Sn | 5E+2 | 6E+2 | 3E-7 | 9E-10 | - | - |
| | LLI wall | (6E+2) | - | - | - | 9E-6 | 9E-5 |
| | W, see ¹¹⁰ Sn | - | 2E+2 | 7E-8 | 2E-10 | - | - |
| 50 Tin-125 | D, see ¹¹⁰ Sn | 4E+2 | 9E+2 | 4E-7 | 1E-9 | - | - |
| | LLI wall | (5E+2) | - | - | - | 6E-6 | 6E-5 |
| | W, see ¹¹⁰ Sn | - | 4E+2 | 1E-7 | 5E-10 | - | - |
| 50 Tin-126 | D, see ¹¹⁰ Sn | 3E+2 | 6E+1 | 2E-8 | 8E-11 | 4E-6 | 4E-5 |
| | W, see ¹¹⁰ Sn | - | 7E+1 | 3E-8 | 9E-11 | - | - |
| 50 Tin-127 | D, see ¹¹⁰ Sn | 7E+3 | 2E+4 | 8E-6 | 3E-8 | 9E-5 | 9E-4 |
| | W, see ¹¹⁰ Sn | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 50 Tin-128 ² | D, see ¹¹⁰ Sn | 9E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| | W, see ¹¹⁰ Sn | - | 4E+4 | 1E-5 | 5E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------------------|--|---|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 51 | Antimony-115 ² | D, all compounds except those given for W | 8E+4 | 2E+5 | 1E-4 | 3E-7 | 1E-3 | 1E-2 |
| | | W, oxides, hydroxides, halides, sulfides, sulfates, and nitrates | - | 3E+5 | 1E-4 | 4E-7 | - | - |
| 51 | Antimony-116m ² | D, see ¹¹⁵ Sb | 2E+4 | 7E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 |
| | | W, see ¹¹⁵ Sb | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| 51 | Antimony-116 ² | D, see ¹¹⁵ Sb | 7E+4 | 3E+5 | 1E-4 | 4E-7 | - | - |
| | | St wall | (9E+4) | - | - | - | 1E-3 | 1E-2 |
| | | W, see ¹¹⁵ Sb | - | 3E+5 | 1E-4 | 5E-7 | - | - |
| 51 | Antimony-117 | D, see ¹¹⁵ Sb | 7E+4 | 2E+5 | 9E-5 | 3E-7 | 9E-4 | 9E-3 |
| | | W, see ¹¹⁵ Sb | - | 3E+5 | 1E-4 | 4E-7 | - | - |
| 51 | Antimony-118m | D, see ¹¹⁵ Sb | 6E+3 | 2E+4 | 8E-6 | 3E-8 | 7E-5 | 7E-4 |
| | | W, see ¹¹⁵ Sb | 5E+3 | 2E+4 | 9E-6 | 3E-8 | - | - |
| 51 | Antimony-119 | D, see ¹¹⁵ Sb | 2E+4 | 5E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | | W, see ¹¹⁵ Sb | 2E+4 | 3E+4 | 1E-5 | 4E-8 | - | - |
| 51 | Antimony-120 ² (16 min) | D, see ¹¹⁵ Sb | 1E+5 | 4E+5 | 2E-4 | 6E-7 | - | - |
| | | St wall | (2E+5) | - | - | - | 2E-3 | 2E-2 |
| | | W, see ¹¹⁵ Sb | - | 5E+5 | 2E-4 | 7E-7 | - | - |
| 51 | Antimony-120 (5.76 d) | D, see ¹¹⁵ Sb | 1E+3 | 2E+3 | 9E-7 | 3E-9 | 1E-5 | 1E-4 |
| | | W, see ¹¹⁵ Sb | 9E+2 | 1E+3 | 5E-7 | 2E-9 | - | - |
| 51 | Antimony-122 | D, see ¹¹⁵ Sb | 8E+2 | 2E+3 | 1E-6 | 3E-9 | - | - |
| | | LLI wall | (8E+2) | - | - | - | 1E-5 | 1E-4 |
| | | W, see ¹¹⁵ Sb | 7E+2 | 1E+3 | 4E-7 | 2E-9 | - | - |
| 51 | Antimony-124m ² | D, see ¹¹⁵ Sb | 3E+5 | 8E+5 | 4E-4 | 1E-6 | 3E-3 | 3E-2 |
| | | W, see ¹¹⁵ Sb | 2E+5 | 6E+5 | 2E-4 | 8E-7 | - | - |
| 51 | Antimony-124 | D, see ¹¹⁵ Sb | 6E+2 | 9E+2 | 4E-7 | 1E-9 | 7E-6 | 7E-5 |
| | | W, see ¹¹⁵ Sb | 5E+2 | 2E+2 | 1E-7 | 3E-10 | - | - |
| 51 | Antimony-125 | D, see ¹¹⁵ Sb | 2E+3 | 2E+3 | 1E-6 | 3E-9 | 3E-5 | 3E-4 |
| | | W, see ¹¹⁵ Sb | - | 5E+2 | 2E-7 | 7E-10 | - | - |
| 51 | Antimony-126m ² | D, see ¹¹⁵ Sb | 5E+4 | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | St wall | (7E+4) | - | - | - | 9E-4 | 9E-3 |
| | | W, see ¹¹⁵ Sb | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 51 | Antimony-126 | D, see ¹¹⁵ Sb | 6E+2 | 1E+3 | 5E-7 | 2E-9 | 7E-6 | 7E-5 |
| | | W, see ¹¹⁵ Sb | 5E+2 | 5E+2 | 2E-7 | 7E-10 | - | - |
| 51 | Antimony-127 | D, see ¹¹⁵ Sb | 8E+2 | 2E+3 | 9E-7 | 3E-9 | - | - |
| | | LLI wall | (8E+2) | - | - | - | 1E-5 | 1E-4 |
| | | W, see ¹¹⁵ Sb | 7E+2 | 9E+2 | 4E-7 | 1E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---|---|---|-----------------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 51 | Antimony-128 ² (10.4 min) | D, see ¹¹⁵ Sb | 8E+4 | 4E+5 | 2E-4 | 5E-7 | - | - |
| | | | St wall (1E+5) | - | - | - | 1E-3 | 1E-2 |
| | | W, see ¹¹⁵ Sb | - | 4E+5 | 2E-4 | 6E-7 | - | - |
| 51 | Antimony-128 (9.01 h) | D, see ¹¹⁵ Sb | 1E+3 | 4E+3 | 2E-6 | 6E-9 | 2E-5 | 2E-4 |
| | | W, see ¹¹⁵ Sb | - | 3E+3 | 1E-6 | 5E-9 | - | - |
| 51 | Antimony-129 | D, see ¹¹⁵ Sb | 3E+3 | 9E+3 | 4E-6 | 1E-8 | 4E-5 | 4E-4 |
| | | W, see ¹¹⁵ Sb | - | 9E+3 | 4E-6 | 1E-8 | - | - |
| 51 | Antimony-130 ² | D, see ¹¹⁵ Sb | 2E+4 | 6E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| | | W, see ¹¹⁵ Sb | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| 51 | Antimony-131 ² | D, see ¹¹⁵ Sb | 1E+4 Thyroid (2E+4) | 2E+4 Thyroid (4E+4) | 1E-5 | - | 6E-8 | 2E-4 |
| | | W, see ¹¹⁵ Sb | - | 2E+4 Thyroid (4E+4) | 1E-5 | - | - | - |
| | | | - | (4E+4) | - | 6E-8 | - | - |
| 52 | Tellurium-116 | D, all compounds except those given for W | 8E+3 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, oxides, hydroxides, and nitrates | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 52 | Tellurium-121m | D, see ¹¹⁶ Te | 5E+2 Bone surf (7E+2) | 2E+2 Bone surf (4E+2) | 8E-8 | - | 5E-10 | 1E-5 |
| | | W, see ¹¹⁶ Te | - | 4E+2 | 2E-7 | 6E-10 | - | - |
| 52 | Tellurium-121 | D, see ¹¹⁶ Te | 3E+3 | 4E+3 | 2E-6 | 6E-9 | 4E-5 | 4E-4 |
| | | W, see ¹¹⁶ Te | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 52 | Tellurium-123m | D, see ¹¹⁶ Te | 6E+2 Bone surf (1E+3) | 2E+2 Bone surf (5E+2) | 9E-8 | - | 8E-10 | 1E-5 |
| | | W, see ¹¹⁶ Te | - | 5E+2 | 2E-7 | 8E-10 | - | - |
| 52 | Tellurium-123 | D, see ¹¹⁶ Te | 5E+2 Bone surf (1E+3) | 2E+2 Bone surf (5E+2) | 8E-8 | - | 7E-10 | 2E-5 |
| | | W, see ¹¹⁶ Te | - | 4E+2 Bone surf (1E+3) | 2E-7 | - | - | - |
| | | | - | (1E+3) | - | 2E-9 | - | - |
| 52 | Tellurium-125m | D, see ¹¹⁶ Te | 1E+3 Bone surf (1E+3) | 4E+2 Bone surf (1E+3) | 2E-7 | - | 1E-9 | 2E-5 |
| | | W, see ¹¹⁶ Te | - | 7E+2 | 3E-7 | 1E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-----------------------------|---|---|-----------|-------------------------------------|--------------------------------|---|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| 52 | Tellurium-127m | D, see ^{116}Te | 6E+2 | 3E+2 | 1E-7 | - | 9E-6 | 9E-5 |
| | | | | Bone surf | | | | |
| | | | - | (4E+2) | - | 6E-10 | - | - |
| | | W, see ^{116}Te | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 52 | Tellurium-127 | D, see ^{116}Te | 7E+3 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ^{116}Te | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 52 | Tellurium-129m | D, see ^{116}Te | 5E+2 | 6E+2 | 3E-7 | 9E-10 | 7E-6 | 7E-5 |
| | | W, see ^{116}Te | - | 2E+2 | 1E-7 | 3E-10 | - | - |
| 52 | Tellurium-129 ² | D, see ^{116}Te | 3E+4 | 6E+4 | 3E-5 | 9E-8 | 4E-4 | 4E-3 |
| | | W, see ^{116}Te | - | 7E+4 | 3E-5 | 1E-7 | - | - |
| 52 | Tellurium-131m | D, see ^{116}Te | 3E+2 | 4E+2 | 2E-7 | - | - | - |
| | | | Thyroid | Thyroid | | | | |
| | | | (6E+2) | (1E+3) | - | 2E-9 | 8E-6 | 8E-5 |
| | | W, see ^{116}Te | - | 4E+2 | 2E-7 | - | - | - |
| | | | Thyroid | | | | | |
| | | | - | (9E+2) | - | 1E-9 | - | - |
| 52 | Tellurium-131 ² | D, see ^{116}Te | 3E+3 | 5E+3 | 2E-6 | - | - | - |
| | | | Thyroid | Thyroid | | | | |
| | | | (6E+3) | (1E+4) | - | 2E-8 | 8E-5 | 8E-4 |
| | | W, see ^{116}Te | - | 5E+3 | 2E-6 | - | - | - |
| | | | Thyroid | | | | | |
| | | | - | (1E+4) | - | 2E-8 | - | - |
| 52 | Tellurium-132 | D, see ^{116}Te | 2E+2 | 2E+2 | 9E-8 | - | - | - |
| | | | Thyroid | Thyroid | | | | |
| | | | (7E+2) | (8E+2) | - | 1E-9 | 9E-6 | 9E-5 |
| | | W, see ^{116}Te | - | 2E+2 | 9E-8 | - | - | - |
| | | | Thyroid | | | | | |
| | | | - | (6E+2) | - | 9E-10 | - | - |
| 52 | Tellurium-133m ² | D, see ^{116}Te | 3E+3 | 5E+3 | 2E-6 | - | - | - |
| | | | Thyroid | Thyroid | | | | |
| | | | (6E+3) | (1E+4) | - | 2E-8 | 9E-5 | 9E-4 |
| | | W, see ^{116}Te | - | 5E+3 | 2E-6 | - | - | - |
| | | | Thyroid | | | | | |
| | | | - | (1E+4) | - | 2E-8 | - | - |
| 52 | Tellurium-133 ² | D, see ^{116}Te | 1E+4 | 2E+4 | 9E-6 | - | - | - |
| | | | Thyroid | Thyroid | | | | |
| | | | (3E+4) | (6E+4) | - | 8E-8 | 4E-4 | 4E-3 |
| | | W, see ^{116}Te | - | 2E+4 | 9E-6 | - | - | - |
| | | | Thyroid | | | | | |
| | | | - | (6E+4) | - | 8E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|----------------------------|--------------------------------|---|------------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 52 | Tellurium-134 ² | D, see ¹¹⁶ Te | 2E+4 | 2E+4 | 1E-5 | - | - | - |
| | | | Thyroid (2E+4) | Thyroid (5E+4) | - | 7E-8 | 3E-4 | 3E-3 |
| | | W, see ¹¹⁶ Te | - | 2E+4 Thyroid (5E+4) | 1E-5 | - | - | - |
| 53 | Iodine-120m ² | D, all compounds | 1E+4 | 2E+4 | 9E-6 | 3E-8 | - | - |
| | | | Thyroid (1E+4) | - | - | - | 2E-4 | 2E-3 |
| 53 | Iodine-120 ² | D, all compounds | 4E+3 | 9E+3 | 4E-6 | - | - | - |
| | | | Thyroid (8E+3) | Thyroid (1E+4) | - | 2E-8 | 1E-4 | 1E-3 |
| 53 | Iodine-121 | D, all compounds | 1E+4 | 2E+4 | 8E-6 | - | - | - |
| | | | Thyroid (3E+4) | Thyroid (5E+4) | - | 7E-8 | 4E-4 | 4E-3 |
| 53 | Iodine-123 | D, all compounds | 3E+3 | 6E+3 | 3E-6 | - | - | - |
| | | | Thyroid (1E+4) | Thyroid (2E+4) | - | 2E-8 | 1E-4 | 1E-3 |
| 53 | Iodine-124 | D, all compounds | 5E+1 | 8E+1 | 3E-8 | - | - | - |
| | | | Thyroid (2E+2) | Thyroid (3E+2) | - | 4E-10 | 2E-6 | 2E-5 |
| 53 | Iodine-125 | D, all compounds | 4E+1 | 6E+1 | 3E-8 | - | - | - |
| | | | Thyroid (1E+2) | Thyroid (2E+2) | - | 3E-10 | 2E-6 | 2E-5 |
| 53 | Iodine-126 | D, all compounds | 2E+1 | 4E+1 | 1E-8 | - | - | - |
| | | | Thyroid (7E+1) | Thyroid (1E+2) | - | 2E-10 | 1E-6 | 1E-5 |
| 53 | Iodine-128 ² | D, all compounds | 4E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | | St wall (6E+4) | - | - | - | 8E-4 | 8E-3 |
| 53 | Iodine-129 | D, all compounds | 5E+0 | 9E+0 | 4E-9 | - | - | - |
| | | | Thyroid (2E+1) | Thyroid (3E+1) | - | 4E-11 | 2E-7 | 2E-6 |
| 53 | Iodine-130 | D, all compounds | 4E+2 | 7E+2 | 3E-7 | - | - | - |
| | | | Thyroid (1E+3) | Thyroid (2E+3) | - | 3E-9 | 2E-5 | 2E-4 |
| 53 | Iodine-131 | D, all compounds | 3E+1 | 5E+1 | 2E-8 | - | - | - |
| | | | Thyroid (9E+1) | Thyroid (2E+2) | - | 2E-10 | 1E-6 | 1E-5 |
| 53 | Iodine-132m ² | D, all compounds | 4E+3 | 8E+3 | 4E-6 | - | - | - |
| | | | Thyroid (1E+4) | Thyroid (2E+4) | - | 3E-8 | 1E-4 | 1E-3 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------|--------------------------|---|---|---------------------------|-------------------------------------|--------------------------------|---|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | |
| 53 | Iodine-132 | D, all compounds | 4E+3 Thyroid (9E+3) | 8E+3 Thyroid (1E+4) | 3E-6 - - | - 2E-8 1E-4 | - 1E-3 |
| 53 | Iodine-133 | D, all compounds | 1E+2 Thyroid (5E+2) | 3E+2 Thyroid (9E+2) | 1E-7 - - | - 1E-9 7E-6 | - 7E-5 |
| 53 | Iodine-134 ² | D, all compounds | 2E+4 Thyroid (3E+4) | 5E+4 - - | 2E-5 - - | 6E-8 - 4E-4 | - 4E-3 |
| 53 | Iodine-135 | D, all compounds | 8E+2 Thyroid (3E+3) | 2E+3 Thyroid (4E+3) | 7E-7 - - | - 6E-9 3E-5 | - 3E-4 |
| 54 | Xenon-120 ² | Submersion ¹ | - | - | 1E-5 | 4E-8 | - |
| 54 | Xenon-121 ² | Submersion ¹ | - | - | 2E-6 | 1E-8 | - |
| 54 | Xenon-122 | Submersion ¹ | - | - | 7E-5 | 3E-7 | - |
| 54 | Xenon-123 | Submersion ¹ | - | - | 6E-6 | 3E-8 | - |
| 54 | Xenon-125 | Submersion ¹ | - | - | 2E-5 | 7E-8 | - |
| 54 | Xenon-127 | Submersion ¹ | - | - | 1E-5 | 6E-8 | - |
| 54 | Xenon-129m | Submersion ¹ | - | - | 2E-4 | 9E-7 | - |
| 54 | Xenon-131m | Submersion ¹ | - | - | 4E-4 | 2E-6 | - |
| 54 | Xenon-133m | Submersion ¹ | - | - | 1E-4 | 6E-7 | - |
| 54 | Xenon-133 | Submersion ¹ | - | - | 1E-4 | 5E-7 | - |
| 54 | Xenon-135m ² | Submersion ¹ | - | - | 9E-6 | 4E-8 | - |
| 54 | Xenon-135 | Submersion ¹ | - | - | 1E-5 | 7E-8 | - |
| 54 | Xenon-138 ² | Submersion ¹ | - | - | 4E-6 | 2E-8 | - |
| 55 | Cesium-125 ² | D, all compounds | 5E+4 St wall (9E+4) | 1E+5 - - | 6E-5 - - | 2E-7 - 1E-3 | - 1E-2 |
| 55 | Cesium-127 | D, all compounds | 6E+4 | 9E+4 | 4E-5 | 1E-7 | 9E-4 |
| 55 | Cesium-129 | D, all compounds | 2E+4 | 3E+4 | 1E-5 | 5E-8 | 3E-4 |
| 55 | Cesium-130 ² | D, all compounds | 6E+4 St wall (1E+5) | 2E+5 - - | 8E-5 - - | 3E-7 - 1E-3 | - 1E-2 |
| 55 | Cesium-131 | D, all compounds | 2E+4 | 3E+4 | 1E-5 | 4E-8 | 3E-4 |
| 55 | Cesium-132 | D, all compounds | 3E+3 | 4E+3 | 2E-6 | 6E-9 | 4E-5 |
| 55 | Cesium-134m | D, all compounds | 1E+5 St wall (1E+5) | 1E+5 - - | 6E-5 - - | 2E-7 - 2E-3 | - 2E-2 |
| 55 | Cesium-134 | D, all compounds | 7E+1 | 1E+2 | 4E-8 | 2E-10 | 9E-7 |
| 55 | Cesium-135m ² | D, all compounds | 1E+5 | 2E+5 | 8E-5 | 3E-7 | 1E-3 |
| 55 | Cesium-135 | D, all compounds | 7E+2 | 1E+3 | 5E-7 | 2E-9 | 1E-5 |
| 55 | Cesium-136 | D, all compounds | 4E+2 | 7E+2 | 3E-7 | 9E-10 | 6E-6 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|----------------------------|---|---|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 55 | Cesium-137 | D, all compounds | 1E+2 | 2E+2 | 6E-8 | 2E-10 | 1E-6 | 1E-5 |
| 55 | Cesium-138 ² | D, all compounds | 2E+4 | 6E+4 | 2E-5 | 8E-8 | - | - |
| | | | St wall (3E+4) | - | - | - | 4E-4 | 4E-3 |
| 56 | Barium-126 ² | D, all compounds | 6E+3 | 2E+4 | 6E-6 | 2E-8 | 8E-5 | 8E-4 |
| 56 | Barium-128 | D, all compounds | 5E+2 | 2E+3 | 7E-7 | 2E-9 | 7E-6 | 7E-5 |
| 56 | Barium-131m ² | D, all compounds | 4E+5 | 1E+6 | 6E-4 | 2E-6 | - | - |
| | | | St wall (5E+5) | - | - | - | 7E-3 | 7E-2 |
| 56 | Barium-131 | D, all compounds | 3E+3 | 8E+3 | 3E-6 | 1E-8 | 4E-5 | 4E-4 |
| 56 | Barium-133m | D, all compounds | 2E+3 | 9E+3 | 4E-6 | 1E-8 | - | - |
| | | | LLI wall (3E+3) | - | - | - | 4E-5 | 4E-4 |
| 56 | Barium-133 | D, all compounds | 2E+3 | 7E+2 | 3E-7 | 9E-10 | 2E-5 | 2E-4 |
| 56 | Barium-135m | D, all compounds | 3E+3 | 1E+4 | 5E-6 | 2E-8 | 4E-5 | 4E-4 |
| 56 | Barium-139 ² | D, all compounds | 1E+4 | 3E+4 | 1E-5 | 4E-8 | 2E-4 | 2E-3 |
| 56 | Barium-140 | D, all compounds | 5E+2 | 1E+3 | 6E-7 | 2E-9 | - | - |
| | | | LLI wall (6E+2) | - | - | - | 8E-6 | 8E-5 |
| 56 | Barium-141 ² | D, all compounds | 2E+4 | 7E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 |
| 56 | Barium-142 ² | D, all compounds | 5E+4 | 1E+5 | 6E-5 | 2E-7 | 7E-4 | 7E-3 |
| 57 | Lanthanum-131 ² | D, all compounds except those given for W | 5E+4 | 1E+5 | 5E-5 | 2E-7 | 6E-4 | 6E-3 |
| | | W, oxides and hydroxides | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| 57 | Lanthanum-132 | D, see ¹³¹ La | 3E+3 | 1E+4 | 4E-6 | 1E-8 | 4E-5 | 4E-4 |
| | | W, see ¹³¹ La | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 57 | Lanthanum-135 | D, see ¹³¹ La | 4E+4 | 1E+5 | 4E-5 | 1E-7 | 5E-4 | 5E-3 |
| | | W, see ¹³¹ La | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 57 | Lanthanum-137 | D, see ¹³¹ La | 1E+4 | 6E+1 | 3E-8 | - | 2E-4 | 2E-3 |
| | | | Liver - | (7E+1) | - | 1E-10 | - | - |
| | | W, see ¹³¹ La | - | 3E+2 | 1E-7 | - | - | - |
| | | | Liver - | (3E+2) | - | 4E-10 | - | - |
| 57 | Lanthanum-138 | D, see ¹³¹ La | 9E+2 | 4E+0 | 1E-9 | 5E-12 | 1E-5 | 1E-4 |
| | | W, see ¹³¹ La | - | 1E+1 | 6E-9 | 2E-11 | - | - |
| 57 | Lanthanum-140 | D, see ¹³¹ La | 6E+2 | 1E+3 | 6E-7 | 2E-9 | 9E-6 | 9E-5 |
| | | W, see ¹³¹ La | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 57 | Lanthanum-141 | D, see ¹³¹ La | 4E+3 | 9E+3 | 4E-6 | 1E-8 | 5E-5 | 5E-4 |
| | | W, see ¹³¹ La | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 57 | Lanthanum-142 ² | D, see ¹³¹ La | 8E+3 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ¹³¹ La | - | 3E+4 | 1E-5 | 5E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-------------------------------|--|-----------------------------------|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 57 | Lanthanum-143 ² | D, see ¹³¹ La | 4E+4 | 1E+5 | 4E-5 | 1E-7 | - | - |
| | | | St wall (4E+4) | - | - | - | 5E-4 | 5E-3 |
| | | W, see ¹³¹ La | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 58 | Cerium-134 | W, all compounds except those given for Y | 5E+2 | 7E+2 | 3E-7 | 1E-9 | - | - |
| | | | LLI wall (6E+2) | - | - | - | 8E-6 | 8E-5 |
| | | Y, oxides, hydroxides, and fluorides | - | 7E+2 | 3E-7 | 9E-10 | - | - |
| 58 | Cerium-135 | W, see ¹³⁴ Ce | 2E+3 | 4E+3 | 2E-6 | 5E-9 | 2E-5 | 2E-4 |
| | | Y, see ¹³⁴ Ce | - | 4E+3 | 1E-6 | 5E-9 | - | - |
| 58 | Cerium-137m | W, see ¹³⁴ Ce | 2E+3 | 4E+3 | 2E-6 | 6E-9 | - | - |
| | | | LLI wall (2E+3) | - | - | - | 3E-5 | 3E-4 |
| | | Y, see ¹³⁴ Ce | - | 4E+3 | 2E-6 | 5E-9 | - | - |
| 58 | Cerium-137 | W, see ¹³⁴ Ce | 5E+4 | 1E+5 | 6E-5 | 2E-7 | 7E-4 | 7E-3 |
| | | Y, see ¹³⁴ Ce | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 58 | Cerium-139 | W, see ¹³⁴ Ce | 5E+3 | 8E+2 | 3E-7 | 1E-9 | 7E-5 | 7E-4 |
| | | Y, see ¹³⁴ Ce | - | 7E+2 | 3E-7 | 9E-10 | - | - |
| 58 | Cerium-141 | W, see ¹³⁴ Ce | 2E+3 | 7E+2 | 3E-7 | 1E-9 | - | - |
| | | | LLI wall (2E+3) | - | - | - | 3E-5 | 3E-4 |
| | | Y, see ¹³⁴ Ce | - | 6E+2 | 2E-7 | 8E-10 | - | - |
| 58 | Cerium-143 | W, see ¹³⁴ Ce | 1E+3 | 2E+3 | 8E-7 | 3E-9 | - | - |
| | | | LLI wall (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | Y, see ¹³⁴ Ce | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| 58 | Cerium-144 | W, see ¹³⁴ Ce | 2E+2 | 3E+1 | 1E-8 | 4E-11 | - | - |
| | | | LLI wall (3E+2) | - | - | - | 3E-6 | 3E-5 |
| | | Y, see ¹³⁴ Ce | - | 1E+1 | 6E-9 | 2E-11 | - | - |
| 59 | Praseodymium-136 ² | W, all compounds except those given for Y | 5E+4 | 2E+5 | 1E-4 | 3E-7 | - | - |
| | | | St wall (7E+4) | - | - | - | 1E-3 | 1E-2 |
| | | Y, oxides, hydroxides, carbides, and fluorides | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| 59 | Praseodymium-137 ² | W, see ¹³⁶ Pr | 4E+4 | 2E+5 | 6E-5 | 2E-7 | 5E-4 | 5E-3 |
| | | Y, see ¹³⁶ Pr | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| 59 | Praseodymium-138m | W, see ¹³⁶ Pr | 1E+4 | 5E+4 | 2E-5 | 8E-8 | 1E-4 | 1E-3 |
| | | Y, see ¹³⁶ Pr | - | 4E+4 | 2E-5 | 6E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|--------------------------------|--|-----------------------------------|--------------|-------------------------------------|----------------|--|-----------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 59 | Praseodymium-139 | W, see ¹³⁶ Pr Y, see ¹³⁶ Pr | 4E+4 - | 1E+5 1E+5 | 5E-5 5E-5 | 2E-7 2E-7 | 6E-4 - | 6E-3 - |
| 59 | Praseodymium-142m ² | W, see ¹³⁶ Pr Y, see ¹³⁶ Pr | 8E+4 - | 2E+5 1E+5 | 7E-5 6E-5 | 2E-7 2E-7 | 1E-3 - | 1E-2 - |
| 59 | Praseodymium-142 | W, see ¹³⁶ Pr Y, see ¹³⁶ Pr | 1E+3 - | 2E+3 2E+3 | 9E-7 8E-7 | 3E-9 3E-9 | 1E-5 - | 1E-4 - |
| 59 | Praseodymium-143 | W, see ¹³⁶ Pr | 9E+2 | 8E+2 | 3E-7 | 1E-9 | - | - |
| | | | LLI wall (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | Y, see ¹³⁶ Pr | - | 7E+2 | 3E-7 | 9E-10 | - | - |
| 59 | Praseodymium-144 ² | W, see ¹³⁶ Pr | 3E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | | St wall (4E+4) | - | - | - | 6E-4 | 6E-3 |
| | | Y, see ¹³⁶ Pr | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 59 | Praseodymium-145 | W, see ¹³⁶ Pr Y, see ¹³⁶ Pr | 3E+3 - | 9E+3 8E+3 | 4E-6 3E-6 | 1E-8 1E-8 | 4E-5 - | 4E-4 - |
| 59 | Praseodymium-147 ² | W, see ¹³⁶ Pr | 5E+4 | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | | St wall (8E+4) | - | - | - | 1E-3 | 1E-2 |
| | | Y, see ¹³⁶ Pr | - | 2E+5 | 8E-5 | 3E-7 | - | - |
| 60 | Neodymium-136 ² | W, all compounds except those given for Y | 1E+4 | 6E+4 | 2E-5 | 8E-8 | 2E-4 | 2E-3 |
| | | Y, oxides, hydroxides, carbides, and fluorides | - | 5E+4 | 2E-5 | 8E-8 | - | - |
| 60 | Neodymium-138 | W, see ¹³⁶ Nd Y, see ¹³⁶ Nd | 2E+3 - | 6E+3 5E+3 | 3E-6 2E-6 | 9E-9 7E-9 | 3E-5 - | 3E-4 - |
| 60 | Neodymium-139m | W, see ¹³⁶ Nd Y, see ¹³⁶ Nd | 5E+3 - | 2E+4 1E+4 | 7E-6 6E-6 | 2E-8 2E-8 | 7E-5 - | 7E-4 - |
| 60 | Neodymium-139 ² | W, see ¹³⁶ Nd Y, see ¹³⁶ Nd | 9E+4 - | 3E+5 3E+5 | 1E-4 1E-4 | 5E-7 4E-7 | 1E-3 - | 1E-2 - |
| 60 | Neodymium-141 | W, see ¹³⁶ Nd Y, see ¹³⁶ Nd | 2E+5 - | 7E+5 6E+5 | 3E-4 3E-4 | 1E-6 9E-7 | 2E-3 - | 2E-2 - |
| 60 | Neodymium-147 | W, see ¹³⁶ Nd | 1E+3 | 9E+2 | 4E-7 | 1E-9 | - | - |
| | | | LLI wall (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | Y, see ¹³⁶ Nd | - | 8E+2 | 4E-7 | 1E-9 | - | - |
| 60 | Neodymium-149 ² | W, see ¹³⁶ Nd Y, see ¹³⁶ Nd | 1E+4 - | 3E+4 2E+4 | 1E-5 1E-5 | 4E-8 3E-8 | 1E-4 - | 1E-3 - |
| 60 | Neodymium-151 ² | W, see ¹³⁶ Nd Y, see ¹³⁶ Nd | 7E+4 - | 2E+5 2E+5 | 8E-5 8E-5 | 3E-7 3E-7 | 9E-4 - | 9E-3 - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-----------------------------|--|---|-----------|-------------------------------------|--------------------------------|---|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| 61 | Promethium-141 ² | W, all compounds except those given for Y | 5E+4 | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | St wall | (6E+4) | - | - | - | 8E-4 | 8E-3 |
| | | Y, oxides, hydroxides, carbides, and fluorides | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| 61 | Promethium-143 | W, see ¹⁴¹ Pm | 5E+3 | 6E+2 | 2E-7 | 8E-10 | 7E-5 | 7E-4 |
| | | Y, see ¹⁴¹ Pm | - | 7E+2 | 3E-7 | 1E-9 | - | - |
| 61 | Promethium-144 | W, see ¹⁴¹ Pm | 1E+3 | 1E+2 | 5E-8 | 2E-10 | 2E-5 | 2E-4 |
| | | Y, see ¹⁴¹ Pm | - | 1E+2 | 5E-8 | 2E-10 | - | - |
| 61 | Promethium-145 | W, see ¹⁴¹ Pm | 1E+4 | 2E+2 | 7E-8 | - | 1E-4 | 1E-3 |
| | | Bone surf | - | (2E+2) | - | 3E-10 | - | - |
| | | Y, see ¹⁴¹ Pm | - | 2E+2 | 8E-8 | 3E-10 | - | - |
| 61 | Promethium-146 | W, see ¹⁴¹ Pm | 2E+3 | 5E+1 | 2E-8 | 7E-11 | 2E-5 | 2E-4 |
| | | Y, see ¹⁴¹ Pm | - | 4E+1 | 2E-8 | 6E-11 | - | - |
| 61 | Promethium-147 | W, see ¹⁴¹ Pm | 4E+3 | 1E+2 | 5E-8 | - | - | - |
| | | Bone surf | (5E+3) | (2E+2) | - | 3E-10 | 7E-5 | 7E-4 |
| | | Y, see ¹⁴¹ Pm | - | 1E+2 | 6E-8 | 2E-10 | - | - |
| 61 | Promethium-148m | W, see ¹⁴¹ Pm | 7E+2 | 3E+2 | 1E-7 | 4E-10 | 1E-5 | 1E-4 |
| | | Y, see ¹⁴¹ Pm | - | 3E+2 | 1E-7 | 5E-10 | - | - |
| 61 | Promethium-148 | W, see ¹⁴¹ Pm | 4E+2 | 5E+2 | 2E-7 | 8E-10 | - | - |
| | | LLI wall | (5E+2) | - | - | - | 7E-6 | 7E-5 |
| | | Y, see ¹⁴¹ Pm | - | 5E+2 | 2E-7 | 7E-10 | - | - |
| 61 | Promethium-149 | W, see ¹⁴¹ Pm | 1E+3 | 2E+3 | 8E-7 | 3E-9 | - | - |
| | | LLI wall | (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | Y, see ¹⁴¹ Pm | - | 2E+3 | 8E-7 | 2E-9 | - | - |
| 61 | Promethium-150 | W, see ¹⁴¹ Pm | 5E+3 | 2E+4 | 8E-6 | 3E-8 | 7E-5 | 7E-4 |
| | | Y, see ¹⁴¹ Pm | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 61 | Promethium-151 | W, see ¹⁴¹ Pm | 2E+3 | 4E+3 | 1E-6 | 5E-9 | 2E-5 | 2E-4 |
| | | Y, see ¹⁴¹ Pm | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 62 | Samarium-141m ² | W, all compounds | 3E+4 | 1E+5 | 4E-5 | 1E-7 | 4E-4 | 4E-3 |
| 62 | Samarium-141 ² | W, all compounds | 5E+4 | 2E+5 | 8E-5 | 2E-7 | - | - |
| | | St wall | (6E+4) | - | - | - | 8E-4 | 8E-3 |
| 62 | Samarium-142 ² | W, all compounds | 8E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| 62 | Samarium-145 | W, all compounds | 6E+3 | 5E+2 | 2E-7 | 7E-10 | 8E-5 | 8E-4 |
| 62 | Samarium-146 | W, all compounds | 1E+1 | 4E-2 | 1E-11 | - | - | - |
| | | Bone surf | | Bone surf | | | | |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-----------------------------|---|---------------------------|---------------------------|-------------------------------------|--------------------------------|---|------------------------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion | INHALATION | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC ($\mu\text{Ci/ml}$) |
| | | (3E+1) | (6E-2) | - | 9E-14 | 3E-7 | 3E-6 | |
| 62 | Samarium-147 | W, all compounds | 2E+1 Bone surf | 4E-2 Bone surf | 2E-11 | - | - | - |
| | | | (3E+1) | (7E-2) | - | 1E-13 | 4E-7 | 4E-6 |
| 62 | Samarium-151 | W, all compounds | 1E+4 LLI wall | 1E+2 Bone surf | 4E-8 | - | - | - |
| | | | (1E+4) | (2E+2) | - | 2E-10 | 2E-4 | 2E-3 |
| 62 | Samarium-153 | W, all compounds | 2E+3 LLI wall | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | | (2E+3) | - | - | - | 3E-5 | 3E-4 |
| 62 | Samarium-155 ² | W, all compounds | 6E+4 St wall | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | | (8E+4) | - | - | - | 1E-3 | 1E-2 |
| 62 | Samarium-156 | W, all compounds | 5E+3 | 9E+3 | 4E-6 | 1E-8 | 7E-5 | 7E-4 |
| 63 | Europium-145 | W, all compounds | 2E+3 | 2E+3 | 8E-7 | 3E-9 | 2E-5 | 2E-4 |
| 63 | Europium-146 | W, all compounds | 1E+3 | 1E+3 | 5E-7 | 2E-9 | 1E-5 | 1E-4 |
| 63 | Europium-147 | W, all compounds | 3E+3 | 2E+3 | 7E-7 | 2E-9 | 4E-5 | 4E-4 |
| 63 | Europium-148 | W, all compounds | 1E+3 | 4E+2 | 1E-7 | 5E-10 | 1E-5 | 1E-4 |
| 63 | Europium-149 | W, all compounds | 1E+4 | 3E+3 | 1E-6 | 4E-9 | 2E-4 | 2E-3 |
| 63 | Europium-150 (12.62 h) | W, all compounds | 3E+3 | 8E+3 | 4E-6 | 1E-8 | 4E-5 | 4E-4 |
| 63 | Europium-150 (34.2 y) | W, all compounds | 8E+2 | 2E+1 | 8E-9 | 3E-11 | 1E-5 | 1E-4 |
| 63 | Europium-152m | W, all compounds | 3E+3 | 6E+3 | 3E-6 | 9E-9 | 4E-5 | 4E-4 |
| 63 | Europium-152 | W, all compounds | 8E+2 | 2E+1 | 1E-8 | 3E-11 | 1E-5 | 1E-4 |
| 63 | Europium-154 | W, all compounds | 5E+2 | 2E+1 | 8E-9 | 3E-11 | 7E-6 | 7E-5 |
| 63 | Europium-155 | W, all compounds | 4E+3 | 9E+1 | 4E-8 | - | 5E-5 | 5E-4 |
| | | | | Bone surf | | | | |
| | | | - | (1E+2) | - | 2E-10 | - | - |
| 63 | Europium-156 | W, all compounds | 6E+2 | 5E+2 | 2E-7 | 6E-10 | 8E-6 | 8E-5 |
| 63 | Europium-157 | W, all compounds | 2E+3 | 5E+3 | 2E-6 | 7E-9 | 3E-5 | 3E-4 |
| 63 | Europium-158 ² | W, all compounds | 2E+4 | 6E+4 | 2E-5 | 8E-8 | 3E-4 | 3E-3 |
| 64 | Gadolinium-145 ² | D, all compounds except those given for W | 5E+4 | 2E+5 | 6E-5 | 2E-7 | - | - |
| | | | St wall | | | | | |
| | | | (5E+4) | - | - | - | 6E-4 | 6E-3 |
| | | W, oxides, hydroxides, and fluorides | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| 64 | Gadolinium-146 | D, see ¹⁴⁵ Gd | 1E+3 | 1E+2 | 5E-8 | 2E-10 | 2E-5 | 2E-4 |
| | | W, see ¹⁴⁵ Gd | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 64 | Gadolinium-147 | D, see ¹⁴⁵ Gd | 2E+3 | 4E+3 | 2E-6 | 6E-9 | 3E-5 | 3E-4 |
| | | W, see ¹⁴⁵ Gd | - | 4E+3 | 1E-6 | 5E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | | |
|--------------------------|--------------------------|--|---|-----------------------------|-------------------------------------|-----------------------------|---|------|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | | |
| 64 | Gadolinium-148 | D, see ^{145}Gd | 1E+1 Bone surf (2E+1) | 8E+3 Bone surf (2E+2) | 3E-12 | - | - | - | 3E-6 |
| | | W, see ^{145}Gd | - | 3E-2 Bone surf (6E-2) | 1E-11 | - | - | - | - |
| 64 | Gadolinium-149 | D, see ^{145}Gd | 3E+3 | 2E+3 | 9E-7 | 3E-9 | 4E-5 | 4E-4 | |
| | | W, see ^{145}Gd | - | 2E+3 | 1E-6 | 3E-9 | - | - | |
| 64 | Gadolinium-151 | D, see ^{145}Gd | 6E+3 | 4E+2 | 2E-7 | - | 9E-5 | 9E-4 | |
| | | W, see ^{145}Gd | - | 1E+3 | 5E-7 | 2E-9 | - | - | |
| 64 | Gadolinium-152 | D, see ^{145}Gd | 2E+1 Bone surf (3E+1) | 1E-2 Bone surf (2E-2) | 4E-12 | - | 3E-14 | 4E-7 | 4E-6 |
| | | W, see ^{145}Gd | - | 4E-2 Bone surf (8E-2) | 2E-11 | - | - | - | - |
| 64 | Gadolinium-153 | D, see ^{145}Gd | 5E+3 | 1E+2 | 6E-8 | - | 6E-5 | 6E-4 | |
| | | W, see ^{145}Gd | - | 6E+2 | 2E-7 | 8E-10 | - | - | |
| 64 | Gadolinium-159 | D, see ^{145}Gd | 3E+3 | 8E+3 | 3E-6 | 1E-8 | 4E-5 | 4E-4 | |
| | | W, see ^{145}Gd | - | 6E+3 | 2E-6 | 8E-9 | - | - | |
| 65 | Terbium-147 ² | W, all compounds | 9E+3 | 3E+4 | 1E-5 | 5E-8 | 1E-4 | 1E-3 | |
| 65 | Terbium-149 | W, all compounds | 5E+3 | 7E+2 | 3E-7 | 1E-9 | 7E-5 | 7E-4 | |
| 65 | Terbium-150 | W, all compounds | 5E+3 | 2E+4 | 9E-6 | 3E-8 | 7E-5 | 7E-4 | |
| 65 | Terbium-151 | W, all compounds | 4E+3 | 9E+3 | 4E-6 | 1E-8 | 5E-5 | 5E-4 | |
| 65 | Terbium-153 | W, all compounds | 5E+3 | 7E+3 | 3E-6 | 1E-8 | 7E-5 | 7E-4 | |
| 65 | Terbium-154 | W, all compounds | 2E+3 | 4E+3 | 2E-6 | 6E-9 | 2E-5 | 2E-4 | |
| 65 | Terbium-155 | W, all compounds | 6E+3 | 8E+3 | 3E-6 | 1E-8 | 8E-5 | 8E-4 | |
| 65 | Terbium-156m (5.0 h) | W, all compounds | 2E+4 | 3E+4 | 1E-5 | 4E-8 | 2E-4 | 2E-3 | |
| 65 | Terbium-156m (24.4 h) | W, all compounds | 7E+3 | 8E+3 | 3E-6 | 1E-8 | 1E-4 | 1E-3 | |
| 65 | Terbium-156 | W, all compounds | 1E+3 | 1E+3 | 6E-7 | 2E-9 | 1E-5 | 1E-4 | |
| 65 | Terbium-157 | W, all compounds | 5E+4 LLI wall (5E+4) | 3E+2 Bone surf (6E+2) | 1E-7 | - | - | - | - |
| | | | | | | 8E-10 | 7E-4 | 7E-3 | |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|---------------------------|-------------------------------------|-------------------------------------|---------------------------------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci}/\text{ml}$) | |
| | | Oral Ingestion ALI (μCi) | INHALATION | | Air ($\mu\text{Ci}/\text{ml}$) | Water ($\mu\text{Ci}/\text{ml}$) | | |
| | | | ALI (μCi) | DAC ($\mu\text{Ci}/\text{ml}$) | | | | |
| 65 | Terbium-158 | W, all compounds | 1E+3 | 2E+1 | 8E-9 | 3E-11 | 2E-5 | 2E-4 |
| 65 | Terbium-160 | W, all compounds | 8E+2 | 2E+2 | 9E-8 | 3E-10 | 1E-5 | 1E-4 |
| 65 | Terbium-161 | W, all compounds | 2E+3 | 2E+3 | 7E-7 | 2E-9 | - | - |
| | | | LLI wall (2E+3) | - | - | - | 3E-5 | 3E-4 |
| 66 | Dysprosium-155 | W, all compounds | 9E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| 66 | Dysprosium-157 | W, all compounds | 2E+4 | 6E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| 66 | Dysprosium-159 | W, all compounds | 1E+4 | 2E+3 | 1E-6 | 3E-9 | 2E-4 | 2E-3 |
| 66 | Dysprosium-165 | W, all compounds | 1E+4 | 5E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| 66 | Dysprosium-166 | W, all compounds | 6E+2 | 7E+2 | 3E-7 | 1E-9 | - | - |
| | | | LLI wall (8E+2) | - | - | - | 1E-5 | 1E-4 |
| 67 | Holmium-155 ² | W, all compounds | 4E+4 | 2E+5 | 6E-5 | 2E-7 | 6E-4 | 6E-3 |
| 67 | Holmium-157 ² | W, all compounds | 3E+5 | 1E+6 | 6E-4 | 2E-6 | 4E-3 | 4E-2 |
| 67 | Holmium-159 ² | W, all compounds | 2E+5 | 1E+6 | 4E-4 | 1E-6 | 3E-3 | 3E-2 |
| 67 | Holmium-161 | W, all compounds | 1E+5 | 4E+5 | 2E-4 | 6E-7 | 1E-3 | 1E-2 |
| 67 | Holmium-162m ² | W, all compounds | 5E+4 | 3E+5 | 1E-4 | 4E-7 | 7E-4 | 7E-3 |
| 67 | Holmium-162 ² | W, all compounds | 5E+5 | 2E+6 | 1E-3 | 3E-6 | - | - |
| | | | St wall (8E+5) | - | - | - | 1E-2 | 1E-1 |
| 67 | Holmium-164m ² | W, all compounds | 1E+5 | 3E+5 | 1E-4 | 4E-7 | 1E-3 | 1E-2 |
| 67 | Holmium-164 ² | W, all compounds | 2E+5 | 6E+5 | 3E-4 | 9E-7 | - | - |
| | | | St wall (2E+5) | - | - | - | 3E-3 | 3E-2 |
| 67 | Holmium-166m | W, all compounds | 6E+2 | 7E+0 | 3E-9 | 9E-12 | 9E-6 | 9E-5 |
| 67 | Holmium-166 | W, all compounds | 9E+2 | 2E+3 | 7E-7 | 2E-9 | - | - |
| | | | LLI wall (9E+2) | - | - | - | 1E-5 | 1E-4 |
| 67 | Holmium-167 | W, all compounds | 2E+4 | 6E+4 | 2E-5 | 8E-8 | 2E-4 | 2E-3 |
| 68 | Erbium-161 | W, all compounds | 2E+4 | 6E+4 | 3E-5 | 9E-8 | 2E-4 | 2E-3 |
| 68 | Erbium-165 | W, all compounds | 6E+4 | 2E+5 | 8E-5 | 3E-7 | 9E-4 | 9E-3 |
| 68 | Erbium-169 | W, all compounds | 3E+3 | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | | LLI wall (4E+3) | - | - | - | 5E-5 | 5E-4 |
| 68 | Erbium-171 | W, all compounds | 4E+3 | 1E+4 | 4E-6 | 1E-8 | 5E-5 | 5E-4 |
| 68 | Erbium-172 | W, all compounds | 1E+3 | 1E+3 | 6E-7 | 2E-9 | - | - |
| | | | LLI wall (E+3) | - | - | - | 2E-5 | 2E-4 |
| 69 | Thulium-162 ² | W, all compounds | 7E+4 | 3E+5 | 1E-4 | 4E-7 | - | - |
| | | | St wall (7E+4) | - | - | - | 1E-3 | 1E-2 |
| 69 | Thulium-166 | W, all compounds | 4E+3 | 1E+4 | 6E-6 | 2E-8 | 6E-5 | 6E-4 |
| 69 | Thulium-167 | W, all compounds | 2E+3 | 2E+3 | 8E-7 | 3E-9 | - | - |
| | | | LLI wall (2E+3) | - | - | - | 3E-5 | 3E-4 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | | |
|--------------------------|----------------------------|---|-----------------------------------|-----------|-------------------------------------|----------------|--|------|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | | |
| 69 | Thulium-170 | W, all compounds | 8E+2 | 2E+2 | 9E-8 | 3E-10 | - | - | |
| | | LLI wall | (1E+3) | - | - | - | 1E-5 | 1E-4 | |
| 69 | Thulium-171 | W, all compounds | 1E+4 | 3E+2 | 1E-7 | - | - | - | |
| | | LLI wall | (1E+4) | Bone surf | (6E+2) | - | 8E-10 | 2E-4 | 2E-3 |
| 69 | Thulium-172 | W, all compounds | 7E+2 | 1E+3 | 5E-7 | 2E-9 | - | - | |
| | | LLI wall | (8E+2) | - | - | - | 1E-5 | 1E-4 | |
| 69 | Thulium-173 | W, all compounds | 4E+3 | 1E+4 | 5E-6 | 2E-8 | 6E-5 | 6E-4 | |
| 69 | Thulium-175 ² | W, all compounds | 7E+4 | 3E+5 | 1E-4 | 4E-7 | - | - | |
| | | St wall | (9E+4) | - | - | - | 1E-3 | 1E-2 | |
| 70 | Ytterbium-162 ² | W, all compounds except those given for Y | 7E+4 | 3E+5 | 1E-4 | 4E-7 | 1E-3 | 1E-2 | |
| | | Y, oxides, hydroxides, and fluorides | - | 3E+5 | 1E-4 | 4E-7 | - | - | |
| 70 | Ytterbium-166 | W, see ¹⁶² Yb | 1E+3 | 2E+3 | 8E-7 | 3E-9 | 2E-5 | 2E-4 | |
| | | Y, see ¹⁶² Yb | - | 2E+3 | 8E-7 | 3E-9 | - | - | |
| 70 | Ytterbium-167 ² | W, see ¹⁶² Yb | 3E+5 | 8E+5 | 3E-4 | 1E-6 | 4E-3 | 4E-2 | |
| | | Y, see ¹⁶² Yb | - | 7E+5 | 3E-4 | 1E-6 | - | - | |
| 70 | Ytterbium-169 | W, see ¹⁶² Yb | 2E+3 | 8E+2 | 4E-7 | 1E-9 | 2E-5 | 2E-4 | |
| | | Y, see ¹⁶² Yb | - | 7E+2 | 3E-7 | 1E-9 | - | - | |
| 70 | Ytterbium-175 | W, see ¹⁶² Yb | 3E+3 | 4E+3 | 1E-6 | 5E-9 | - | - | |
| | | LLI wall | (3E+3) | - | - | - | 4E-5 | 4E-4 | |
| | | Y, see ¹⁶² Yb | - | 3E+3 | 1E-6 | 5E-9 | - | - | |
| 70 | Ytterbium-177 ² | W, see ¹⁶² Yb | 2E+4 | 5E+4 | 2E-5 | 7E-8 | 2E-4 | 2E-3 | |
| | | Y, see ¹⁶² Yb | - | 5E+4 | 2E-5 | 6E-8 | - | - | |
| 70 | Ytterbium-178 ² | W, see ¹⁶² Yb | 1E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 | |
| | | Y, see ¹⁶² Yb | - | 4E+4 | 2E-5 | 5E-8 | - | - | |
| 71 | Lutetium-169 | W, all compounds except those given for Y | 3E+3 | 4E+3 | 2E-6 | 6E-9 | 3E-5 | 3E-4 | |
| | | Y, oxides, hydroxides, and fluorides | - | 4E+3 | 2E-6 | 6E-9 | - | - | |
| 71 | Lutetium-170 | W, see ¹⁶⁹ Lu | 1E+3 | 2E+3 | 9E-7 | 3E-9 | 2E-5 | 2E-4 | |
| | | Y, see ¹⁶⁹ Lu | - | 2E+3 | 8E-7 | 3E-9 | - | - | |
| 71 | Lutetium-171 | W, see ¹⁶⁹ Lu | 2E+3 | 2E+3 | 8E-7 | 3E-9 | 3E-5 | 3E-4 | |
| | | Y, see ¹⁶⁹ Lu | - | 2E+3 | 8E-7 | 3E-9 | - | - | |
| 71 | Lutetium-172 | W, see ¹⁶⁹ Lu | 1E+3 | 1E+3 | 5E-7 | 2E-9 | 1E-5 | 1E-4 | |
| | | Y, see ¹⁶⁹ Lu | - | 1E+3 | 5E-7 | 2E-9 | - | - | |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|----------------------------|--------------------------------|-----------------------------------|-----------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 71 | Lutetium-173 | W, see ¹⁶⁹ Lu | 5E+3 | 3E+2 | 1E-7 | - | 7E-5 | 7E-4 |
| | | | | Bone surf | | | | |
| | | Y, see ¹⁶⁹ Lu | - | (5E+2) | - | 6E-10 | - | - |
| | | Y, see ¹⁶⁹ Lu | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 71 | Lutetium-174m | W, see ¹⁶⁹ Lu | 2E+3 | 2E+2 | 1E-7 | - | - | - |
| | | | LLI wall | Bone surf | | | | |
| | | | (3E+3) | (3E+2) | - | 5E-10 | 4E-5 | 4E-4 |
| | | Y, see ¹⁶⁹ Lu | - | 2E+2 | 9E-8 | 3E-10 | - | - |
| 71 | Lutetium-174 | W, see ¹⁶⁹ Lu | 5E+3 | 1E+2 | 5E-8 | - | 7E-5 | 7E-4 |
| | | | | Bone surf | | | | |
| | | | - | (2E+2) | - | 3E-10 | - | - |
| | | Y, see ¹⁶⁹ Lu | - | 2E+2 | 6E-8 | 2E-10 | - | - |
| 71 | Lutetium-176m | W, see ¹⁶⁹ Lu | 8E+3 | 3E+4 | 1E-5 | 3E-8 | 1E-4 | 1E-3 |
| | | Y, see ¹⁶⁹ Lu | - | 2E+4 | 9E-6 | 3E-8 | - | - |
| 71 | Lutetium-176 | W, see ¹⁶⁹ Lu | 7E+2 | 5E+0 | 2E-9 | - | 1E-5 | 1E-4 |
| | | | | Bone surf | | | | |
| | | | - | (1E+1) | - | 2E-11 | - | - |
| | | Y, see ¹⁶⁹ Lu | - | 8E+0 | 3E-9 | 1E-11 | - | - |
| 71 | Lutetium-177m | W, see ¹⁶⁹ Lu | 7E+2 | 1E+2 | 5E-8 | - | 1E-5 | 1E-4 |
| | | | | Bone surf | | | | |
| | | | - | (1E+2) | - | 2E-10 | - | - |
| | | Y, see ¹⁶⁹ Lu | - | 8E+1 | 3E-8 | 1E-10 | - | - |
| 71 | Lutetium-177 | W, see ¹⁶⁹ Lu | 2E+3 | 2E+3 | 9E-7 | 3E-9 | - | - |
| | | | LLI wall | | | | | |
| | | | (3E+3) | - | - | - | 4E-5 | 4E-4 |
| | | Y, see ¹⁶⁹ Lu | - | 2E+3 | 9E-7 | 3E-9 | - | - |
| 71 | Lutetium-178m ² | W, see ¹⁶⁹ Lu | 5E+4 | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | | St wall | | | | | |
| | | | (6E+4) | - | - | - | 8E-4 | 8E-3 |
| | | Y, see ¹⁶⁹ Lu | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| 71 | Lutetium-178 ² | W, see ¹⁶⁹ Lu | 4E+4 | 1E+5 | 5E-5 | 2E-7 | - | - |
| | | | St wall | | | | | |
| | | | (4E+4) | - | - | - | 6E-4 | 6E-3 |
| | | Y, see ¹⁶⁹ Lu | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 71 | Lutetium-179 | W, see ¹⁶⁹ Lu | 6E+3 | 2E+4 | 8E-6 | 3E-8 | 9E-5 | 9E-4 |
| | | Y, see ¹⁶⁹ Lu | - | 2E+4 | 6E-6 | 3E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|------------|-----------|-------------------------------------|----------------|--|--------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC (μCi/ml) |
| 72 | Hafnium-170 | D, all compounds except those given for W | 3E+3 | 6E+3 | 2E-6 | 8E-9 | 4E-5 | 4E-4 |
| | | W, oxides, hydroxides, carbides, and nitrates | - | 5E+3 | 2E-6 | 6E-9 | - | - |
| 72 | Hafnium-172 | D, see ¹⁷⁰ Hf | 1E+3 | 9E+0 | 4E-9 | - | 2E-5 | 2E-4 |
| | | | | Bone surf | | | | |
| | | | - | (2E+1) | - | 3E-11 | - | - |
| | | W, see ¹⁷⁰ Hf | - | 4E+1 | 2E-8 | - | - | - |
| | | | | Bone surf | | | | |
| | | | - | (6E+1) | - | 8E-11 | - | - |
| 72 | Hafnium-173 | D, see ¹⁷⁰ Hf | 5E+3 | 1E+4 | 5E-6 | 2E-8 | 7E-5 | 7E-4 |
| | | W, see ¹⁷⁰ Hf | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 72 | Hafnium-175 | D, see ¹⁷⁰ Hf | 3E+3 | 9E+2 | 4E-7 | - | 4E-5 | 4E-4 |
| | | | | Bone surf | | | | |
| | | | - | (1E+3) | - | 1E-9 | - | - |
| | | W, see ¹⁷⁰ Hf | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 72 | Hafnium-177m ² | D, see ¹⁷⁰ Hf | 2E+4 | 6E+4 | 2E-5 | 8E-8 | 3E-4 | 3E-3 |
| | | W, see ¹⁷⁰ Hf | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 72 | Hafnium-178m | D, see ¹⁷⁰ Hf | 3E+2 | 1E+0 | 5E-10 | - | 3E-6 | 3E-5 |
| | | | | Bone surf | | | | |
| | | | - | (2E+0) | - | 3E-12 | - | - |
| | | W, see ¹⁷⁰ Hf | - | 5E+0 | 2E-9 | - | - | - |
| | | | | Bone surf | | | | |
| | | | - | (9E+0) | - | 1E-11 | - | - |
| 72 | Hafnium-179m | D, see ¹⁷⁰ Hf | 1E+3 | 3E+2 | 1E-7 | - | 1E-5 | 1E-4 |
| | | | | Bone surf | | | | |
| | | | - | (6E+2) | - | 8E-10 | - | - |
| | | W, see ¹⁷⁰ Hf | - | 6E+2 | 3E-7 | 8E-10 | - | - |
| 72 | Hafnium-180m | D, see ¹⁷⁰ Hf | 7E+3 | 2E+4 | 9E-6 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ¹⁷⁰ Hf | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 72 | Hafnium-181 | D, see ¹⁷⁰ Hf | 1E+3 | 2E+2 | 7E-8 | - | 2E-5 | 2E-4 |
| | | | | Bone surf | | | | |
| | | | - | (4E+2) | - | 6E-10 | - | - |
| | | W, see ¹⁷⁰ Hf | - | 4E+2 | 2E-7 | 6E-10 | - | - |
| 72 | Hafnium-182m ² | D, see ¹⁷⁰ Hf | 4E+4 | 9E+4 | 4E-5 | 1E-7 | 5E-4 | 5E-3 |
| | | W, see ¹⁷⁰ Hf | - | 1E+5 | 6E-5 | 2E-7 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|----------------------------|--|---|---------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 72 | Hafnium-182 | D, see ¹⁷⁰ Hf | 2E+2 | 8E-1 | 3E-10 | - | - | - |
| | | | Bone surf (4E+2) | Bone surf (2E+0) | - | 2E-12 | 5E-6 | 5E-5 |
| | | W, see ¹⁷⁰ Hf | - | 3E+0 | 1E-9 | - | - | - |
| | | | - | Bone surf (7E+0) | - | 1E-11 | - | - |
| 72 | Hafnium-183 ² | D, see ¹⁷⁰ Hf | 2E+4 | 5E+4 | 2E-5 | 6E-8 | 3E-4 | 3E-3 |
| | | W, see ¹⁷⁰ Hf | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| 73 | Tantalum-172 ² | W, all compounds except those given for Y | 4E+4 | 1E+5 | 5E-5 | 2E-7 | 5E-4 | 5E-3 |
| | | Y, elemental Ta, oxides, hydroxides, halides, carbides, nitrates, and nitrides | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 73 | Tantalum-173 | W, see ¹⁷² Ta | 7E+3 | 2E+4 | 8E-6 | 3E-8 | 9E-5 | 9E-4 |
| | | Y, see ¹⁷² Ta | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 73 | Tantalum-174 ² | W, see ¹⁷² Ta | 3E+4 | 1E+5 | 4E-5 | 1E-7 | 4E-4 | 4E-3 |
| | | Y, see ¹⁷² Ta | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 73 | Tantalum-175 | W, see ¹⁷² Ta | 6E+3 | 2E+4 | 7E-6 | 2E-8 | 8E-5 | 8E-4 |
| | | Y, see ¹⁷² Ta | - | 1E+4 | 6E-6 | 2E-8 | - | - |
| 73 | Tantalum-176 | W, see ¹⁷² Ta | 4E+3 | 1E+4 | 5E-6 | 2E-8 | 5E-5 | 5E-4 |
| | | Y, see ¹⁷² Ta | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| 73 | Tantalum-177 | W, see ¹⁷² Ta | 1E+4 | 2E+4 | 8E-6 | 3E-8 | 2E-4 | 2E-3 |
| | | Y, see ¹⁷² Ta | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 73 | Tantalum-178 | W, see ¹⁷² Ta | 2E+4 | 9E+4 | 4E-5 | 1E-7 | 2E-4 | 2E-3 |
| | | Y, see ¹⁷² Ta | - | 7E+4 | 3E-5 | 1E-7 | - | - |
| 73 | Tantalum-179 | W, see ¹⁷² Ta | 2E+4 | 5E+3 | 2E-6 | 8E-9 | 3E-4 | 3E-3 |
| | | Y, see ¹⁷² Ta | - | 9E+2 | 4E-7 | 1E-9 | - | - |
| 73 | Tantalum-180m | W, see ¹⁷² Ta | 2E+4 | 7E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| | | Y, see ¹⁷² Ta | - | 6E+4 | 2E-5 | 8E-8 | - | - |
| 73 | Tantalum-180 | W, see ¹⁷² Ta | 1E+3 | 4E+2 | 2E-7 | 6E-10 | 2E-5 | 2E-4 |
| | | Y, see ¹⁷² Ta | - | 2E+1 | 1E-8 | 3E-11 | - | - |
| 73 | Tantalum-182m ² | W, see ¹⁷² Ta | 2E+5 | 5E+5 | 2E-4 | 8E-7 | - | - |
| | | St wall | (2E+5) | - | - | - | 3E-3 | 3E-2 |
| | | Y, see ¹⁷² Ta | - | 4E+5 | 2E-4 | 6E-7 | - | - |
| 73 | Tantalum-182 | W, see ¹⁷² Ta | 8E+2 | 3E+2 | 1E-7 | 5E-10 | 1E-5 | 1E-4 |
| | | Y, see ¹⁷² Ta | - | 1E+2 | 6E-8 | 2E-10 | - | - |
| 73 | Tantalum-183 | W, see ¹⁷² Ta | 9E+2 | 1E+3 | 5E-7 | 2E-9 | - | - |
| | | LLI wall | (1E+3) | - | - | - | 2E-5 | 2E-4 |
| | | Y, see ¹⁷² Ta | - | 1E+3 | 4E-7 | 1E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|------------------------------|---|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 73 Tantalum-184 | W, see ¹⁷² Ta | 2E+3 | 5E+3 | 2E-6 | 8E-9 | 3E-5 | 3E-4 |
| | Y, see ¹⁷² Ta | - | 5E+3 | 2E-6 | 7E-9 | - | - |
| 73 Tantalum-185 ² | W, see ¹⁷² Ta | 3E+4 | 7E+4 | 3E-5 | 1E-7 | 4E-4 | 4E-3 |
| | Y, see ¹⁷² Ta | - | 6E+4 | 3E-5 | 9E-8 | - | - |
| 73 Tantalum-186 ² | W, see ¹⁷² Ta | 5E+4 | 2E+5 | 1E-4 | 3E-7 | - | - |
| | St wall | (7E+4) | - | - | - | 1E-3 | 1E-2 |
| | Y, see ¹⁷² Ta | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| 74 Tungsten-176 | D, all compounds | 1E+4 | 5E+4 | 2E-5 | 7E-8 | 1E-4 | 1E-3 |
| 74 Tungsten-177 | D, all compounds | 2E+4 | 9E+4 | 4E-5 | 1E-7 | 3E-4 | 3E-3 |
| 74 Tungsten-178 | D, all compounds | 5E+3 | 2E+4 | 8E-6 | 3E-8 | 7E-5 | 7E-4 |
| 74 Tungsten-179 ² | D, all compounds | 5E+5 | 2E+6 | 7E-4 | 2E-6 | 7E-3 | 7E-2 |
| 74 Tungsten-181 | D, all compounds | 2E+4 | 3E+4 | 1E-5 | 5E-8 | 2E-4 | 2E-3 |
| 74 Tungsten-185 | D, all compounds | 2E+3 | 7E+3 | 3E-6 | 9E-9 | - | - |
| | LLI wall | (3E+3) | - | - | - | 4E-5 | 4E-4 |
| 74 Tungsten-187 | D, all compounds | 2E+3 | 9E+3 | 4E-6 | 1E-8 | 3E-5 | 3E-4 |
| 74 Tungsten-188 | D, all compounds | 4E+2 | 1E+3 | 5E-7 | 2E-9 | - | - |
| | LLI wall | (5E+2) | - | - | - | 7E-6 | 7E-5 |
| 75 Rhenium-177 ² | D, all compounds except those given for W | 9E+4 | 3E+5 | 1E-4 | 4E-7 | - | - |
| | St wall | (1E+5) | - | - | - | 2E-3 | 2E-2 |
| | W, oxides, hydroxides, and nitrates | - | 4E+5 | 1E-4 | 5E-7 | - | - |
| 75 Rhenium-178 ² | D, see ¹⁷⁷ Re | 7E+4 | 3E+5 | 1E-4 | 4E-7 | - | - |
| | St wall | (1E+5) | - | - | - | 1E-3 | 1E-2 |
| | W, see ¹⁷⁷ Re | - | 3E+5 | 1E-4 | 4E-7 | - | - |
| 75 Rhenium-181 | D, see ¹⁷⁷ Re | 5E+3 | 9E+3 | 4E-6 | 1E-8 | 7E-5 | 7E-4 |
| | W, see ¹⁷⁷ Re | - | 9E+3 | 4E-6 | 1E-8 | - | - |
| 75 Rhenium-182 (12.7 h) | D, see ¹⁷⁷ Re | 7E+3 | 1E+4 | 5E-6 | 2E-8 | 9E-5 | 9E-4 |
| | W, see ¹⁷⁷ Re | - | 2E+4 | 6E-6 | 2E-8 | - | - |
| 75 Rhenium-182 (64.0 h) | D, see ¹⁷⁷ Re | 1E+3 | 2E+3 | 1E-6 | 3E-9 | 2E-5 | 2E-4 |
| | W, see ¹⁷⁷ Re | - | 2E+3 | 9E-7 | 3E-9 | - | - |
| 75 Rhenium-184m | D, see ¹⁷⁷ Re | 2E+3 | 3E+3 | 1E-6 | 4E-9 | 3E-5 | 3E-4 |
| | W, see ¹⁷⁷ Re | - | 4E+2 | 2E-7 | 6E-10 | - | - |
| 75 Rhenium-184 | D, see ¹⁷⁷ Re | 2E+3 | 4E+3 | 1E-6 | 5E-9 | 3E-5 | 3E-4 |
| | W, see ¹⁷⁷ Re | - | 1E+3 | 6E-7 | 2E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|---|-------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 75 | Rhenium-186m | D, see ¹⁷⁷ Re | 1E+3 | 2E+3 | 7E-7 | - | - | - |
| | | | St wall (2E+3) | St wall (2E+3) | - | 3E-9 | 2E-5 | 2E-4 |
| | | W, see ¹⁷⁷ Re | - | 2E+2 | 6E-8 | 2E-10 | - | - |
| 75 | Rhenium-186 | D, see ¹⁷⁷ Re | 2E+3 | 3E+3 | 1E-6 | 4E-9 | 3E-5 | 3E-4 |
| | | W, see ¹⁷⁷ Re | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| 75 | Rhenium-187 | D, see ¹⁷⁷ Re | 6E+5 | 8E+5 | 4E-4 | - | 8E-3 | 8E-2 |
| | | | St wall (9E+5) | - | 1E-6 | - | - | - |
| | | W, see ¹⁷⁷ Re | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 75 | Rhenium-188m ² | D, see ¹⁷⁷ Re | 8E+4 | 1E+5 | 6E-5 | 2E-7 | 1E-3 | 1E-2 |
| | | W, see ¹⁷⁷ Re | - | 1E+5 | 6E-5 | 2E-7 | - | - |
| 75 | Rhenium-188 | D, see ¹⁷⁷ Re | 2E+3 | 3E+3 | 1E-6 | 4E-9 | 2E-5 | 2E-4 |
| | | W, see ¹⁷⁷ Re | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 75 | Rhenium-189 | D, see ¹⁷⁷ Re | 3E+3 | 5E+3 | 2E-6 | 7E-9 | 4E-5 | 4E-4 |
| | | W, see ¹⁷⁷ Re | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| 76 | Osmium-180 ² | D, all compounds except those given for W and Y | 1E+5 | 4E+5 | 2E-4 | 5E-7 | 1E-3 | 1E-2 |
| | | W, halides and nitrates | - | 5E+5 | 2E-4 | 7E-7 | - | - |
| | | Y, oxides and hydroxides | - | 5E+5 | 2E-4 | 6E-7 | - | - |
| 76 | Osmium-181 ² | D, see ¹⁸⁰ Os | 1E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | | W, see ¹⁸⁰ Os | - | 5E+4 | 2E-5 | 6E-8 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 4E+4 | 2E-5 | 6E-8 | - | - |
| 76 | Osmium-182 | D, see ¹⁸⁰ Os | 2E+3 | 6E+3 | 2E-6 | 8E-9 | 3E-5 | 3E-4 |
| | | W, see ¹⁸⁰ Os | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| 76 | Osmium-185 | D, see ¹⁸⁰ Os | 2E+3 | 5E+2 | 2E-7 | 7E-10 | 3E-5 | 3E-4 |
| | | W, see ¹⁸⁰ Os | - | 8E+2 | 3E-7 | 1E-9 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 8E+2 | 3E-7 | 1E-9 | - | - |
| 76 | Osmium-189m | D, see ¹⁸⁰ Os | 8E+4 | 2E+5 | 1E-4 | 3E-7 | 1E-3 | 1E-2 |
| | | W, see ¹⁸⁰ Os | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| 76 | Osmium-191m | D, see ¹⁸⁰ Os | 1E+4 | 3E+4 | 1E-5 | 4E-8 | 2E-4 | 2E-3 |
| | | W, see ¹⁸⁰ Os | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| 76 | Osmium-191 | D, see ¹⁸⁰ Os | 2E+3 | 2E+3 | 9E-7 | 3E-9 | - | - |
| | | | LLI wall (3E+3) | - | - | - | 3E-5 | 3E-4 |
| | | W, see ¹⁸⁰ Os | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 1E+3 | 6E-7 | 2E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|---|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 76 | Osmium-193 | D, see ¹⁸⁰ Os | 2E+3 | 5E+3 | 2E-6 | 6E-9 | - | - |
| | | | LLI wall | | | | | |
| | | | (2E+3) | - | - | - | 2E-5 | 2E-4 |
| | | W, see ¹⁸⁰ Os | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| 76 | Osmium-194 | D, see ¹⁸⁰ Os | 4E+2 | 4E+1 | 2E-8 | 6E-11 | - | - |
| | | | LLI wall | | | | | |
| | | | (6E+2) | - | - | - | 8E-6 | 8E-5 |
| | | W, see ¹⁸⁰ Os | - | 6E+1 | 2E-8 | 8E-11 | - | - |
| | | Y, see ¹⁸⁰ Os | - | 8E+0 | 3E-9 | 1E-11 | - | - |
| 77 | Iridium-182 ² | D, all compounds except those given for W and Y | 4E+4 | 1E+5 | 6E-5 | 2E-7 | - | - |
| | | | St wall | | | | | |
| | | | (4E+4) | - | - | - | 6E-4 | 6E-3 |
| | | W, halides, nitrates, and metallic iridium | - | 2E+5 | 6E-5 | 2E-7 | - | - |
| | | Y, oxides and hydroxides | - | 1E+5 | 5E-5 | 2E-7 | - | - |
| 77 | Iridium-184 | D, see ¹⁸² Ir | 8E+3 | 2E+4 | 1E-5 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ¹⁸² Ir | - | 3E+4 | 1E-5 | 5E-8 | - | - |
| | | Y, see ¹⁸² Ir | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 77 | Iridium-185 | D, see ¹⁸² Ir | 5E+3 | 1E+4 | 5E-6 | 2E-8 | 7E-5 | 7E-4 |
| | | W, see ¹⁸² Ir | - | 1E+4 | 5E-6 | 2E-8 | - | - |
| | | Y, see ¹⁸² Ir | - | 1E+4 | 4E-6 | 1E-8 | - | - |
| 77 | Iridium-186 | D, see ¹⁸² Ir | 2E+3 | 8E+3 | 3E-6 | 1E-8 | 3E-5 | 3E-4 |
| | | W, see ¹⁸² Ir | - | 6E+3 | 3E-6 | 9E-9 | - | - |
| | | Y, see ¹⁸² Ir | - | 6E+3 | 2E-6 | 8E-9 | - | - |
| 77 | Iridium-187 | D, see ¹⁸² Ir | 1E+4 | 3E+4 | 1E-5 | 5E-8 | 1E-4 | 1E-3 |
| | | W, see ¹⁸² Ir | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| | | Y, see ¹⁸² Ir | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 77 | Iridium-188 | D, see ¹⁸² Ir | 2E+3 | 5E+3 | 2E-6 | 6E-9 | 3E-5 | 3E-4 |
| | | W, see ¹⁸² Ir | - | 4E+3 | 1E-6 | 5E-9 | - | - |
| | | Y, see ¹⁸² Ir | - | 3E+3 | 1E-6 | 5E-9 | - | - |
| 77 | Iridium-189 | D, see ¹⁸² Ir | 5E+3 | 5E+3 | 2E-6 | 7E-9 | - | - |
| | | | LLI wall | | | | | |
| | | | (5E+3) | - | - | - | 7E-5 | 7E-4 |
| | | W, see ¹⁸² Ir | - | 4E+3 | 2E-6 | 5E-9 | - | - |
| | | Y, see ¹⁸² Ir | - | 4E+3 | 1E-6 | 5E-9 | - | - |
| 77 | Iridium-190m ² | D, see ¹⁸² Ir | 2E+5 | 2E+5 | 8E-5 | 3E-7 | 2E-3 | 2E-2 |
| | | W, see ¹⁸² Ir | - | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | Y, see ¹⁸² Ir | - | 2E+5 | 8E-5 | 3E-7 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|-------------------------------|--------------------------|--------------------------------|------------|-----------|-------------------------------------|----------------|--|--------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC (μCi/ml) |
| 77 Iridium-190 | D, see ¹⁸² Ir | 1E+3 | 9E+2 | 4E-7 | 1E-9 | 1E-5 | 1E-4 | |
| | W, see ¹⁸² Ir | - | 1E+3 | 4E-7 | 1E-9 | - | - | |
| | Y, see ¹⁸² Ir | - | 9E+2 | 4E-7 | 1E-9 | - | - | |
| 77 Iridium-192m | D, see ¹⁸² Ir | 3E+3 | 9E+1 | 4E-8 | 1E-10 | 4E-5 | 4E-4 | |
| | W, see ¹⁸² Ir | - | 2E+2 | 9E-8 | 3E-10 | - | - | |
| | Y, see ¹⁸² Ir | - | 2E+1 | 6E-9 | 2E-11 | - | - | |
| 77 Iridium-192 | D, see ¹⁸² Ir | 9E+2 | 3E+2 | 1E-7 | 4E-10 | 1E-5 | 1E-4 | |
| | W, see ¹⁸² Ir | - | 4E+2 | 2E-7 | 6E-10 | - | - | |
| | Y, see ¹⁸² Ir | - | 2E+2 | 9E-8 | 3E-10 | - | - | |
| 77 Iridium-194m | D, see ¹⁸² Ir | 6E+2 | 9E+1 | 4E-8 | 1E-10 | 9E-6 | 9E-5 | |
| | W, see ¹⁸² Ir | - | 2E+2 | 7E-8 | 2E-10 | - | - | |
| | Y, see ¹⁸² Ir | - | 1E+2 | 4E-8 | 1E-10 | - | - | |
| 77 Iridium-194 | D, see ¹⁸² Ir | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 1E-5 | 1E-4 | |
| | W, see ¹⁸² Ir | - | 2E+3 | 9E-7 | 3E-9 | - | - | |
| | Y, see ¹⁸² Ir | - | 2E+3 | 8E-7 | 3E-9 | - | - | |
| 77 Iridium-195m | D, see ¹⁸² Ir | 8E+3 | 2E+4 | 1E-5 | 3E-8 | 1E-4 | 1E-3 | |
| | W, see ¹⁸² Ir | - | 3E+4 | 1E-5 | 4E-8 | - | - | |
| | Y, see ¹⁸² Ir | - | 2E+4 | 9E-6 | 3E-8 | - | - | |
| 77 Iridium-195 | D, see ¹⁸² Ir | 1E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 | |
| | W, see ¹⁸² Ir | - | 5E+4 | 2E-5 | 7E-8 | - | - | |
| | Y, see ¹⁸² Ir | - | 4E+4 | 2E-5 | 6E-8 | - | - | |
| 78 Platinum-186 | D, all compounds | 1E+4 | 4E+4 | 2E-5 | 5E-8 | 2E-4 | 2E-3 | |
| 78 Platinum-188 | D, all compounds | 2E+3 | 2E+3 | 7E-7 | 2E-9 | 2E-5 | 2E-4 | |
| 78 Platinum-189 | D, all compounds | 1E+4 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 | |
| 78 Platinum-191 | D, all compounds | 4E+3 | 8E+3 | 4E-6 | 1E-8 | 5E-5 | 5E-4 | |
| 78 Platinum-193m | D, all compounds | | 3E+3 | 6E+3 | 3E-6 | 8E-9 | - | - |
| | | LLI wall (3E+4) | - | - | - | - | 4E-5 | 4E-4 |
| 78 Platinum-193 | D, all compounds | | 4E+4 | 2E+4 | 1E-5 | 3E-8 | - | - |
| | | LLI wall (5E+4) | - | - | - | - | 6E-4 | 6E-3 |
| 78 Platinum-195m | D, all compounds | | 2E+3 | 4E+3 | 2E-6 | 6E-9 | - | - |
| | | LLI wall (2E+3) | - | - | - | - | 3E-5 | 3E-4 |
| 78 Platinum-197m ² | D, all compounds | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 | |
| 78 Platinum-197 | D, all compounds | 3E+3 | 1E+4 | 4E-6 | 1E-8 | 4E-5 | 4E-4 | |
| 78 Platinum-199 ² | D, all compounds | 5E+4 | 1E+5 | 6E-5 | 2E-7 | 7E-4 | 7E-3 | |
| 78 Platinum-200 | D, all compounds | 1E+3 | 3E+3 | 1E-6 | 5E-9 | 2E-5 | 2E-4 | |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------|--|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 79 Gold-193 | D, all compounds except those given for W and Y | 9E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| | W, halides and nitrates | - | 2E+4 | 9E-6 | 3E-8 | - | - |
| | Y, oxides and hydroxides | - | 2E+4 | 8E-6 | 3E-8 | - | - |
| 79 Gold-194 | D, see ¹⁹³ Au | 3E+3 | 8E+3 | 3E-6 | 1E-8 | 4E-5 | 4E-4 |
| | W, see ¹⁹³ Au | - | 5E+3 | 2E-6 | 8E-9 | - | - |
| | Y, see ¹⁹³ Au | - | 5E+3 | 2E-6 | 7E-9 | - | - |
| 79 Gold-195 | D, see ¹⁹³ Au | 5E+3 | 1E+4 | 5E-6 | 2E-8 | 7E-5 | 7E-4 |
| | W, see ¹⁹³ Au | - | 1E+3 | 6E-7 | 2E-9 | - | - |
| | Y, see ¹⁹³ Au | - | 4E+2 | 2E-7 | 6E-10 | - | - |
| 79 Gold-198m | D, see ¹⁹³ Au | 1E+3 | 3E+3 | 1E-6 | 4E-9 | 1E-5 | 1E-4 |
| | W, see ¹⁹³ Au | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| | Y, see ¹⁹³ Au | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 79 Gold-198 | D, see ¹⁹³ Au | 1E+3 | 4E+3 | 2E-6 | 5E-9 | 2E-5 | 2E-4 |
| | W, see ¹⁹³ Au | - | 2E+3 | 8E-7 | 3E-9 | - | - |
| | Y, see ¹⁹³ Au | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| 79 Gold-199 | D, see ¹⁹³ Au | 3E+3 LLI wall | 9E+3 | 4E-6 | 1E-8 | - | - |
| | | (3E+3) | - | - | - | 4E-5 | 4E-4 |
| | W, see ¹⁹³ Au | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| 79 Gold-200m | D, see ¹⁹³ Au | - | 4E+3 | 2E-6 | 5E-9 | - | - |
| | W, see ¹⁹³ Au | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| | Y, see ¹⁹³ Au | - | 2E+4 | 1E-6 | 3E-9 | - | - |
| 79 Gold-200 ² | D, see ¹⁹³ Au | 3E+4 | 6E+4 | 3E-5 | 9E-8 | 4E-4 | 4E-3 |
| | W, see ¹⁹³ Au | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| | Y, see ¹⁹³ Au | - | 7E+4 | 3E-5 | 1E-7 | - | - |
| 79 Gold-201 ² | D, see ¹⁹³ Au | 7E+4 St wall | 2E+5 | 9E-5 | 3E-7 | - | - |
| | | (9E+4) | - | - | - | 1E-3 | 1E-2 |
| | W, see ¹⁹³ Au | - | 2E+5 | 1E-4 | 3E-7 | - | - |
| 80 Mercury-193m | Vapor | - | 8E+3 | 4E-6 | 1E-8 | - | - |
| | Organic D | 4E+3 | 1E+4 | 5E-6 | 2E-8 | 6E-5 | 6E-4 |
| | D, sulfates | 3E+3 | 9E+3 | 4E-6 | 1E-8 | 4E-5 | 4E-4 |
| 80 Mercury-193 | W, oxides, hydroxides, halides, nitrates, and sulfides | - | 8E+3 | 3E-6 | 1E-8 | - | - |
| | Vapor | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| | Organic D | 2E+4 | 6E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| 80 Mercury-193m | D, see ^{193m} Hg | 2E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | W, see ^{193m} Hg | - | 4E+4 | 2E-5 | 6E-8 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|-------------------------------|---------------------------|--------------------------------|------------|-----------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 80 Mercury-194 | Vapor | - | 3E+1 | 1E-8 | 4E-11 | - | - |
| | Organic D | 2E+1 | 3E+1 | 1E-8 | 4E-11 | 2E-7 | 2E-6 |
| | D, see ^{193m} Hg | 8E+2 | 4E+1 | 2E-8 | 6E-11 | 1E-5 | 1E-4 |
| | W, see ^{193m} Hg | - | 1E+2 | 5E-8 | 2E-10 | - | - |
| 80 Mercury-195m | Vapor | - | 4E+3 | 2E-6 | 6E-9 | - | - |
| | Organic D | 3E+3 | 6E+3 | 3E-6 | 8E-9 | 4E-5 | 4E-4 |
| | D, see ^{193m} Hg | 2E+3 | 5E+3 | 2E-6 | 7E-9 | 3E-5 | 3E-4 |
| | W, see ^{193m} Hg | - | 4E+3 | 2E-6 | 5E-9 | - | - |
| 80 Mercury-195 | Vapor | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| | Organic D | 2E+4 | 5E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | D, see ^{193m} Hg | 1E+4 | 4E+4 | 1E-5 | 5E-8 | 2E-4 | 2E-3 |
| | W, see ^{193m} Hg | - | 3E+4 | 1E-5 | 5E-8 | - | - |
| 80 Mercury-197m | Vapor | - | 5E+3 | 2E-6 | 7E-9 | - | - |
| | Organic D | 4E+3 | 9E+3 | 4E-6 | 1E-8 | 5E-5 | 5E-4 |
| | D, see ^{193m} Hg | 3E+3 | 7E+3 | 3E-6 | 1E-8 | 4E-5 | 4E-4 |
| | W, see ^{193m} Hg | - | 5E+3 | 2E-6 | 7E-9 | - | - |
| 80 Mercury-197 | Vapor | - | 8E+3 | 4E-6 | 1E-8 | - | - |
| | Organic D | 7E+3 | 1E+4 | 6E-6 | 2E-8 | 9E-5 | 9E-4 |
| | D, see ^{193m} Hg | 6E+3 | 1E+4 | 5E-6 | 2E-8 | 8E-5 | 8E-4 |
| | W, see ^{193m} Hg | - | 9E+3 | 4E-6 | 1E-8 | - | - |
| 80 Mercury-199m ² | Vapor | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| | Organic D | 6E+4 | 2E+5 | 7E-5 | 2E-7 | - | - |
| | | (1E+5) | - | - | - | 1E-3 | 1E-2 |
| | D, see ^{193m} Hg | 6E+4 | 1E+5 | 6E-5 | 2E-7 | 8E-4 | 8E-3 |
| 80 Mercury-203 | W, see ^{193m} Hg | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| | Vapor | - | 8E+2 | 4E-7 | 1E-9 | - | - |
| | Organic D | 5E+2 | 8E+2 | 3E-7 | 1E-9 | 7E-6 | 7E-5 |
| | D, see ^{193m} Hg | 2E+3 | 1E+3 | 5E-7 | 2E-9 | 3E-5 | 3E-4 |
| 81 Thallium-194m ² | W, see ^{193m} Hg | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| | D, all compounds | 5E+4 | 2E+5 | 6E-5 | 2E-7 | - | - |
| 81 Thallium-194 ² | | (7E+4) | - | - | - | 1E-3 | 1E-2 |
| | D, all compounds | 3E+5 | 6E+5 | 2E-4 | 8E-7 | - | - |
| 81 Thallium-195 ² | | (3E+5) | - | - | - | 4E-3 | 4E-2 |
| | D, all compounds | 6E+4 | 1E+5 | 5E-5 | 2E-7 | 9E-4 | 9E-3 |
| 81 Thallium-197 | D, all compounds | 7E+4 | 1E+5 | 5E-5 | 2E-7 | 1E-3 | 1E-2 |
| 81 Thallium-198m ² | D, all compounds | 3E+4 | 5E+4 | 2E-5 | 8E-8 | 4E-4 | 4E-3 |
| 81 Thallium-198 | D, all compounds | 2E+4 | 3E+4 | 1E-5 | 5E-8 | 3E-4 | 3E-3 |
| 81 Thallium-199 | D, all compounds | 6E+4 | 8E+4 | 4E-5 | 1E-7 | 9E-4 | 9E-3 |
| 81 Thallium-200 | D, all compounds | 8E+3 | 1E+4 | 5E-6 | 2E-8 | 1E-4 | 1E-3 |
| 81 Thallium-201 | D, all compounds | 2E+4 | 2E+4 | 9E-6 | 3E-8 | 2E-4 | 2E-3 |
| 81 Thallium-202 | D, all compounds | 4E+3 | 5E+3 | 2E-6 | 7E-9 | 5E-5 | 5E-4 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|--------------------------|--------------------------------|---------------------------|---------------------------|-------------------------------------|--------------------------------|---|------------------------------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion | INHALATION | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| | | | ALI (μCi) | ALI (μCi) | | | | DAC ($\mu\text{Ci/ml}$) |
| 81 | Thallium-204 | D, all compounds | 2E+3 | 2E+3 | 9E-7 | 3E-9 | 2E-5 | 2E-4 |
| 82 | Lead-195m ² | D, all compounds | 6E+4 | 2E+5 | 8E-5 | 3E-7 | 8E-4 | 8E-3 |
| 82 | Lead-198 | D, all compounds | 3E+4 | 6E+4 | 3E-5 | 9E-8 | 4E-4 | 4E-3 |
| 82 | Lead-199 ² | D, all compounds | 2E+4 | 7E+4 | 3E-5 | 1E-7 | 3E-4 | 3E-3 |
| 82 | Lead-200 | D, all compounds | 3E+3 | 6E+3 | 3E-6 | 9E-9 | 4E-5 | 4E-4 |
| 82 | Lead-201 | D, all compounds | 7E+3 | 2E+4 | 8E-6 | 3E-8 | 1E-4 | 1E-3 |
| 82 | Lead-202m | D, all compounds | 9E+3 | 3E+4 | 1E-5 | 4E-8 | 1E-4 | 1E-3 |
| 82 | Lead-202 | D, all compounds | 1E+2 | 5E+1 | 2E-8 | 7E-11 | 2E-6 | 2E-5 |
| 82 | Lead-203 | D, all compounds | 5E+3 | 9E+3 | 4E-6 | 1E-8 | 7E-5 | 7E-4 |
| 82 | Lead-205 | D, all compounds | 4E+3 | 1E+3 | 6E-7 | 2E-9 | 5E-5 | 5E-4 |
| 82 | Lead-209 | D, all compounds | 2E+4 | 6E+4 | 2E-5 | 8E-8 | 3E-4 | 3E-3 |
| 82 | Lead-210 | D, all compounds | 6E-1 Bone surf | 2E-1 Bone surf | 1E-10 | - | - | - |
| | | | (1E+0) | (4E-1) | - | 6E-13 | 1E-8 | 1E-7 |
| 82 | Lead-211 ² | D, all compounds | 1E+4 | 6E+2 | 3E-7 | 9E-10 | 2E-4 | 2E-3 |
| 82 | Lead-212 | D, all compounds | 8E+1 Bone surf | 3E+1 | 1E-8 | 5E-11 | - | - |
| | | | (1E+2) | - | - | - | 2E-6 | 2E-5 |
| 82 | Lead-214 ² | D, all compounds | 9E+3 | 8E+2 | 3E-7 | 1E-9 | 1E-4 | 1E-3 |
| 83 | Bismuth-200 ² | D, nitrates | 3E+4 | 8E+4 | 4E-5 | 1E-7 | 4E-4 | 4E-3 |
| | | W, all other compounds | - | 1E+5 | 4E-5 | 1E-7 | - | - |
| 83 | Bismuth-201 ² | D, see ²⁰⁰ Bi | 1E+4 | 3E+4 | 1E-5 | 4E-8 | 2E-4 | 2E-3 |
| | | W, see ²⁰⁰ Bi | - | 4E+4 | 2E-5 | 5E-8 | - | - |
| 83 | Bismuth-202 ² | D, see ²⁰⁰ Bi | 1E+4 | 4E+4 | 2E-5 | 6E-8 | 2E-4 | 2E-3 |
| | | W, see ²⁰⁰ Bi | - | 8E+4 | 3E-5 | 1E-7 | - | - |
| 83 | Bismuth-203 | D, see ²⁰⁰ Bi | 2E+3 | 7E+3 | 3E-6 | 9E-9 | 3E-5 | 3E-4 |
| | | W, see ²⁰⁰ Bi | - | 6E+3 | 3E-6 | 9E-9 | - | - |
| 83 | Bismuth-205 | D, see ²⁰⁰ Bi | 1E+3 | 3E+3 | 1E-6 | 3E-9 | 2E-5 | 2E-4 |
| | | W, see ²⁰⁰ Bi | - | 1E+3 | 5E-7 | 2E-9 | - | - |
| 83 | Bismuth-206 | D, see ²⁰⁰ Bi | 6E+2 | 1E+3 | 6E-7 | 2E-9 | 9E-6 | 9E-5 |
| | | W, see ²⁰⁰ Bi | - | 9E+2 | 4E-7 | 1E-9 | - | - |
| 83 | Bismuth-207 | D, see ²⁰⁰ Bi | 1E+3 | 2E+3 | 7E-7 | 2E-9 | 1E-5 | 1E-4 |
| | | W, see ²⁰⁰ Bi | - | 4E+2 | 1E-7 | 5E-10 | - | - |
| 83 | Bismuth-210m | D, see ²⁰⁰ Bi | 4E+1 | 5E+0 | 2E-9 | - | - | - |
| | | Kidneys | Kidneys | | | | | |
| | | | (6E+1) | (6E+0) | - | 9E-12 | 8E-7 | 8E-6 |
| | | W, see ²⁰⁰ Bi | - | 7E-1 | 3E-10 | 9E-13 | - | - |
| 83 | Bismuth-210 | D, see ²⁰⁰ Bi | 8E+2 | 2E+2 | 1E-7 | - | 1E-5 | 1E-4 |
| | | | | Kidneys | | | | |
| | | | - | (4E+2) | - | 5E-10 | - | - |
| | | W, see ²⁰⁰ Bi | - | 3E+1 | 1E-8 | 4E-11 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|---------------------------|---|-----------------------------------|------------------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 83 | Bismuth-212 ² | D, see ²⁰⁰ Bi | 5E+3 | 2E+2 | 1E-7 | 3E-10 | 7E-5 | 7E-4 |
| | | W, see ²⁰⁰ Bi | - | 3E+2 | 1E-7 | 4E-10 | - | - |
| 83 | Bismuth-213 ² | D, see ²⁰⁰ Bi | 7E+3 | 3E+2 | 1E-7 | 4E-10 | 1E-4 | 1E-3 |
| | | W, see ²⁰⁰ Bi | - | 4E+2 | 1E-7 | 5E-10 | - | - |
| 83 | Bismuth-214 ² | D, see ²⁰⁰ Bi | 2E+4 | 8E+2 | 3E-7 | 1E-9 | - | - |
| | | St wall | (2E+4) | - | - | - | 3E-4 | 3E-3 |
| | | W, see ²⁰⁰ Bi | - | 9E-2 | 4E-7 | 1E-9 | - | - |
| 84 | Polonium-203 ² | D, all compounds except those given for W | 3E+4 | 6E+4 | 3E-5 | 9E-8 | 3E-4 | 3E-3 |
| | | W, oxides, hydroxides, and nitrates | - | 9E+4 | 4E-5 | 1E-7 | - | - |
| 84 | Polonium-205 ² | D, see ²⁰³ Po | 2E+4 | 4E+4 | 2E-5 | 5E-8 | 3E-4 | 3E-3 |
| | | W, see ²⁰³ Po | - | 7E+4 | 3E-5 | 1E-7 | - | - |
| 84 | Polonium-207 | D, see ²⁰³ Po | 8E+3 | 3E+4 | 1E-5 | 3E-8 | 1E-4 | 1E-3 |
| | | W, see ²⁰³ Po | - | 3E+4 | 1E-5 | 4E-8 | - | - |
| 84 | Polonium-210 | D, see ²⁰³ Po | 3E+0 | 6E-1 | 3E-10 | 9E-13 | 4E-8 | 4E-7 |
| | | W, see ²⁰³ Po | - | 6E-1 | 3E-10 | 9E-13 | - | - |
| 85 | Astatine-207 ² | D, halides | 6E+3 | 3E+3 | 1E-6 | 4E-9 | 8E-5 | 8E-4 |
| | | W | - | 2E+3 | 9E-7 | 3E-9 | - | - |
| 85 | Astatine-211 | D, halides | 1E+2 | 8E+1 | 3E-8 | 1E-10 | 2E-6 | 2E-5 |
| | | W | - | 5E+1 | 2E-8 | 8E-11 | - | - |
| 86 | Radon-220 | With daughters removed | - | 2E+4 | 7E-6 | 2E-8 | - | - |
| | | With daughters present | - | 2E+1 | 9E-9 | 3E-11 | - | - |
| | | | | (or 12 working level months) | (or 1.0 working level) | | | |
| 86 | Radon-222 | With daughters removed | - | 1E+4 | 4E-6 | 1E-8 | - | - |
| | | With daughters present | - | 1E+2 | 3E-8 | 1E-10 | - | - |
| | | | | (or 4 working level months) | (or 0.33 working level) | | | |
| 87 | Francium-222 ² | D, all compounds | 2E+3 | 5E+2 | 2E-7 | 6E-10 | 3E-5 | 3E-4 |
| 87 | Francium-223 ² | D, all compounds | 6E+2 | 8E+2 | 3E-7 | 1E-9 | 8E-6 | 8E-5 |
| 88 | Radium-223 | W, all compounds | 5E+0 | 7E-1 | 3E-10 | 9E-13 | - | - |
| | | Bone surf | (9E+0) | - | - | - | 1E-7 | 1E-6 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|----------------------------|---|--------------------------------|------------------------|------------------------|-------------------------------------|-----------------------------|---|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) |
| | | Oral Ingestion | INHALATION | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | |
| | | | ALI (μCi) | ALI (μCi) | | | |
| 88 Radium-224 | W, all compounds | 8E+0 | 2E+0 | 7E-10 | 2E-12 | - | - |
| | | Bone surf (2E+1) | - | - | - | 2E-7 | 2E-6 |
| 88 Radium-225 | W, all compounds | 8E+0 | 7E-1 | 3E-10 | 9E-13 | - | - |
| | | Bone surf (2E+1) | - | - | - | 2E-7 | 2E-6 |
| 88 Radium-226 | W, all compounds | 2E+0 | 6E-1 | 3E-10 | 9E-13 | - | - |
| | | Bone surf (5E+0) | - | - | - | 6E-8 | 6E-7 |
| 88 Radium-227 ² | W, all compounds | 2E+4 | 1E+4 | 6E-6 | - | - | - |
| | | Bone surf (2E+4) | Bone surf (2E+4) | - | 3E-8 | 3E-4 | 3E-3 |
| 88 Radium-228 | W, all compounds | 2E+0 | 1E+0 | 5E-10 | 2E-12 | - | - |
| | | Bone surf (4E+0) | - | - | - | 6E-8 | 6E-7 |
| 89 Actinium-224 | D, all compounds except those given for W and Y | 2E+3 LLI wall | 3E+1 Bone surf | 1E-8 | - | - | - |
| | | (2E+3) | (4E+1) | - | 5E-11 | 3E-5 | 3E-4 |
| | W, halides and nitrates | - | 5E+1 | 2E-8 | 7E-11 | - | - |
| | Y, oxides and hydroxides | - | 5E+1 | 2E-8 | 6E-11 | - | - |
| 89 Actinium-225 | D, see ²²⁴ Ac | 5E+1 LLI wall | 3E-1 Bone surf | 1E-10 | - | - | - |
| | | (5E+1) | (5E-1) | - | 7E-13 | 7E-7 | 7E-6 |
| | W, see ²²⁴ Ac | - | 6E-1 | 3E-10 | 9E-13 | - | - |
| | Y, see ²²⁴ Ac | - | 6E-1 | 3E-10 | 9E-13 | - | - |
| 89 Actinium-226 | D, see ²²⁴ Ac | 1E+2 LLI wall | 3E+0 Bone surf | 1E-9 | - | - | - |
| | | (1E+2) | (4E+0) | - | 5E-12 | 2E-6 | 2E-5 |
| | W, see ²²⁴ Ac | - | 5E+0 | 2E-9 | 7E-12 | - | - |
| | Y, see ²²⁴ Ac | - | 5E+0 | 2E-9 | 6E-12 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|-----------------------------|---|--------------------------------|---|------------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | |
| 89 Actinium-227 | D, see ²²⁴ Ac | 2E-1 Bone surf (4E-1) | 4E-4 Bone surf (8E-4) | 2E-13 - | - | - | 5E-8 |
| | W, see ²²⁴ Ac | - | 2E-3 Bone surf (3E-3) | 7E-13 - | - | - | - |
| | Y, see ²²⁴ Ac | - | 4E-3 | 2E-12 | 6E-15 | - | - |
| 89 Actinium-228 | D, see ²²⁴ Ac | 2E+3 | 9E+0 Bone surf (2E+1) | 4E-9 - | - | 3E-5 | 3E-4 |
| | W, see ²²⁴ Ac | - | 4E+1 Bone surf (6E+1) | 2E-8 - | 2E-11 | - | - |
| | Y, see ²²⁴ Ac | - | 4E+1 | 2E-8 | 6E-11 | - | - |
| 90 Thorium-226 ² | W, all compounds except those given for Y | 5E+3 St wall (5E+3) | 2E+2 - | 6E-8 - | 2E-10 - | - 7E-5 | - 7E-4 |
| | Y, oxides and hydroxides | - | 1E+2 | 6E-8 | 2E-10 | - | - |
| 90 Thorium-227 | W, see ²²⁶ Th | 1E+2 | 3E-1 | 1E-10 | 5E-13 | 2E-6 | 2E-5 |
| | Y, see ²²⁶ Th | - | 3E-1 | 1E-10 | 5E-13 | - | - |
| 90 Thorium-228 | W, see ²²⁶ Th | 6E+0 Bone surf (1E+1) | 1E-2 Bone surf (2E-2) | 4E-12 - | - | 3E-14 2E-7 | 2E-6 |
| | Y, see ²²⁶ Th | - | 2E-2 | 7E-12 | 2E-14 | - | - |
| 90 Thorium-229 | W, see ²²⁶ Th | 6E-1 Bone surf (1E+0) | 9E-4 Bone surf (2E-3) | 4E-13 - | - | 3E-15 2E-8 | 2E-7 |
| | Y, see ²²⁶ Th | - | 2E-3 Bone surf (3E-3) | 1E-12 - | - | - | - |
| 90 Thorium-230 | W, see ²²⁶ Th | 4E+0 Bone surf (9E+0) | 6E-3 Bone surf (2E-2) | 3E-12 - | - | - | - |
| | Y, see ²²⁶ Th | - | 2E-2 Bone surf (2E-2) | 6E-12 - | - | 3E-14 | - |
| 90 Thorium-231 | W, see ²²⁶ Th | 4E+3 | 6E+3 | 3E-6 | 9E-9 | 5E-5 | 5E-4 |
| | Y, see ²²⁶ Th | - | 6E+3 | 3E-6 | 9E-9 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|-------------------------------|---|---|---------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 90 | Thorium-232 | W, see ²²⁶ Th | 7E-1 | 1E-3 | 5E-13 | - | - | - |
| | | | Bone surf (2E+0) | Bone surf (3E-3) | - | 4E-15 | 3E-8 | 3E-7 |
| | | Y, see ²²⁶ Th | - | 3E-3 | 1E-12 | - | - | - |
| | | | - | Bone surf (4E-3) | - | 6E-15 | - | - |
| 90 | Thorium-234 | W, see ²²⁶ Th | 3E+2 | 2E+2 | 8E-8 | 3E-10 | - | - |
| | | | LLI wall (4E+2) | - | - | - | 5E-6 | 5E-5 |
| | | Y, see ²²⁶ Th | - | 2E+2 | 6E-8 | 2E-10 | - | - |
| 91 | Protactinium-227 ² | W, all compounds except those given for Y | 4E+3 | 1E+2 | 5E-8 | 2E-10 | 5E-5 | 5E-4 |
| | | Y, oxides and hydroxides | - | 1E+2 | 4E-8 | 1E-10 | - | - |
| 91 | Protactinium-228 | W, see ²²⁷ Pa | 1E+3 | 1E+1 | 5E-9 | - | 2E-5 | 2E-4 |
| | | | - | Bone surf (2E+1) | - | 3E-11 | - | - |
| | | Y, see ²²⁷ Pa | - | 1E+1 | 5E-9 | 2E-11 | - | - |
| 91 | Protactinium-230 | W, see ²²⁷ Pa | 6E+2 | 5E+0 | 2E-9 | 7E-12 | - | - |
| | | | Bone surf (9E+2) | - | - | - | 1E-5 | 1E-4 |
| | | Y, see ²²⁷ Pa | - | 4E+0 | 1E-9 | 5E-12 | - | - |
| 91 | Protactinium-231 | W, see ²²⁷ Pa | 2E-1 | 2E-3 | 6E-13 | - | - | - |
| | | | Bone surf (5E-1) | Bone surf (4E-3) | - | 6E-15 | 6E-9 | 6E-8 |
| | | Y, see ²²⁷ Pa | - | 4E-3 | 2E-12 | - | - | - |
| | | | - | Bone surf (6E-3) | - | 8E-15 | - | - |
| 91 | Protactinium-232 | W, see ²²⁷ Pa | 1E+3 | 2E+1 | 9E-9 | - | 2E-5 | 2E-4 |
| | | | - | Bone surf (6E+1) | - | 8E-11 | - | - |
| | | Y, see ²²⁷ Pa | - | 6E+1 | 2E-8 | - | - | - |
| | | | - | Bone surf (7E+1) | - | 1E-10 | - | - |
| 91 | Protactinium-233 | W, see ²²⁷ Pa | 1E+3 | 7E+2 | 3E-7 | 1E-9 | - | - |
| | | | LLI wall (2E+3) | - | - | - | E-5 | 2E-4 |
| | | Y, see ²²⁷ Pa | - | 6E+2 | 2E-7 | 8E-10 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|--------------------------|--------------------------------|-----------------------------------|--------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 91 | Protactinium-234 | W, see ²²⁷ Pa | 2E+3 | 8E+3 | 3E-6 | 1E-8 | 3E-5 | 3E-4 |
| | | Y, see ²²⁷ Pa | - | 7E+3 | 3E-6 | 9E-9 | - | - |
| 92 | Uranium-230 | D, UF, UOF, UO(NO) | 4E+0 | 4E-1 | 2E-10 | - | - | - |
| | | Bone surf | (6E+0) | (6E-1) | - | 8E-13 | 8E-8 | 8E-7 |
| | | W, UO, UF, UCI | - | 4E-1 | 1E-10 | 5E-13 | - | - |
| | | Y, UO, UO | - | 3E-1 | 1E-10 | 4E-13 | - | - |
| 92 | Uranium-231 | D, see ²³⁰ U | 5E+3 | 8E+3 | 3E-6 | 1E-8 | - | - |
| | | LLI wall | (4E+3) | - | - | - | 6E-5 | 6E-4 |
| | | W, see ²³⁰ U | - | 6E+3 | 2E-6 | 8E-9 | - | - |
| | | Y, see ²³⁰ U | - | 5E+3 | 2E-6 | 6E-9 | - | - |
| 92 | Uranium-232 | D, see ²³⁰ U | 2E+0 | 2E-1 | 9E-11 | - | - | - |
| | | Bone surf | (4E+0) | (4E-1) | - | 6E-13 | 6E-8 | 6E-7 |
| | | W, see ²³⁰ U | - | 4E-1 | 2E-10 | 5E-13 | - | - |
| | | Y, see ²³⁰ U | - | 8E-3 | 3E-12 | 1E-14 | - | - |
| 92 | Uranium-233 | D, see ²³⁰ U | 1E+1 | 1E+0 | 5E-10 | - | - | - |
| | | Bone surf | (2E+1) | (2E+0) | - | 3E-12 | 3E-7 | 3E-6 |
| | | W, see ²³⁰ U | - | 7E-1 | 3E-10 | 1E-12 | - | - |
| | | Y, see ²³⁰ U | - | 4E-2 | 2E-11 | 5E-14 | - | - |
| 92 | Uranium-234 ³ | D, see ²³⁰ U | 1E+1 | 1E+0 | 5E-10 | - | - | - |
| | | Bone surf | (2E+1) | (2E+0) | - | 3E-12 | 3E-7 | 3E-6 |
| | | W, see ²³⁰ U | - | 7E-1 | 3E-10 | 1E-12 | - | - |
| | | Y, see ²³⁰ U | - | 4E-2 | 2E-11 | 5E-14 | - | - |
| 92 | Uranium-235 ³ | D, see ²³⁰ U | 1E+1 | 1E+0 | 6E-10 | - | - | - |
| | | Bone surf | (2E+1) | (2E+0) | - | 3E-12 | 3E-7 | 3E-6 |
| | | W, see ²³⁰ U | - | 8E-1 | 3E-10 | 1E-12 | - | - |
| | | Y, see ²³⁰ U | - | 4E-2 | 2E-11 | 6E-14 | - | - |
| 92 | Uranium-236 | D, see ²³⁰ U | 1E+1 | 1E+0 | 5E-10 | - | - | - |
| | | Bone surf | (2E+1) | (2E+0) | - | 3E-12 | 3E-7 | 3E-6 |
| | | W, see ²³⁰ U | - | 8E-1 | 3E-10 | 1E-12 | - | - |
| | | Y, see ²³⁰ U | - | 4E-2 | 2E-11 | 6E-14 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|---------------------------------|-------------------------|---|---|------------|-------------------------------------|--------------------------------|---|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | |
| 92 Uranium-237 | D, see ²³⁰ U | 2E+3 LLI wall (2E+3) | 3E+3 - | 1E-6 - | 4E-9 - | - 3E-5 | - 3E-4 |
| | W, see ²³⁰ U | - | 2E+3 | 7E-7 | 2E-9 | - | - |
| | Y, see ²³⁰ U | - | 2E+3 | 6E-7 | 2E-9 | - | - |
| 92 Uranium-238 ³ | D, see ²³⁰ U | 1E+1 Bone surf (2E+1) | 1E+0 Bone surf (2E+0) | 6E-10 - | - 3E-12 | - 3E-7 | - 3E-6 |
| | W, see ²³⁰ U | - | 8E-1 | 3E-10 | 1E-12 | - | - |
| | Y, see ²³⁰ U | - | 4E-2 | 2E-11 | 6E-14 | - | - |
| 92 Uranium-239 ² | D, see ²³⁰ U | 7E+4 | 2E+5 | 8E-5 | 3E-7 | 9E-4 | 9E-3 |
| | W, see ²³⁰ U | - | 2E+5 | 7E-5 | 2E-7 | - | - |
| | Y, see ²³⁰ U | - | 2E+5 | 6E-5 | 2E-7 | - | - |
| 92 Uranium-240 | D, see ²³⁰ U | 1E+3 | 4E+3 | 2E-6 | 5E-9 | 2E-5 | 2E-4 |
| | W, see ²³⁰ U | - | 3E+3 | 1E-6 | 4E-9 | - | - |
| | Y, see ²³⁰ U | - | 2E+3 | 1E-6 | 3E-9 | - | - |
| 92 Uranium-natural ³ | D, see ²³⁰ U | 1E+1 Bone surf (2E+1) | 1E+0 Bone surf (2E+0) | 5E-10 - | - 3E-12 | - 3E-7 | - 3E-6 |
| | W, see ²³⁰ U | - | 8E-1 | 3E-10 | 9E-13 | - | - |
| | Y, see ²³⁰ U | - | 5E-2 | 2E-11 | 9E-14 | - | - |
| 93 Neptunium-232 ² | W, all compounds | 1E+5 | 2E+3 Bone surf (5E+2) | 7E-7 - | - 6E-9 | 2E-3 - | 2E-2 - |
| 93 Neptunium-233 ² | W, all compounds | 8E+5 | 3E+6 | 1E-3 | 4E-6 | 1E-2 | 1E-1 |
| 93 Neptunium-234 | W, all compounds | 2E+3 | 3E+3 | 1E-6 | 4E-9 | 3E-5 | 3E-4 |
| 93 Neptunium-235 | W, all compounds | 2E+4 LLI wall (2E+4) | 8E+2 Bone surf (1E+3) | 3E-7 - | - 2E-9 | - 3E-4 | - 3E-3 |
| 93 Neptunium-236 (1.15E+5 y) | W, all compounds | 3E+0 Bone surf (6E+0) | 2E-2 Bone surf (5E-2) | 9E-12 - | - 8E-14 | - 9E-8 | - 9E-7 |
| 93 Neptunium-236 (22.5 h) | W, all compounds | 3E+3 Bone surf (4E+3) | 3E+1 Bone surf (7E+1) | 1E-8 - | - 1E-10 | - 5E-5 | - 5E-4 |
| 93 Neptunium-237 | W, all compounds | 5E-1 Bone surf (1E+0) | 4E-3 Bone surf (1E-2) | 2E-12 - | - 1E-14 | - 2E-8 | - 2E-7 |
| 93 Neptunium-238 | W, all compounds | 1E+3 | 6E+1 Bone surf (2E+2) | 3E-8 - | - 2E-10 | 2E-5 - | 2E-4 - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------|----------------------------|--------------------------------|-----------------------------------|-----------------------------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | |
| 93 | Neptunium-239 | W, all compounds | 2E+3 LLI wall (2E+3) | 2E+3 - | 9E-7 - | 3E-9 - | - 2E-5 2E-4 |
| 93 | Neptunium-240 ² | W, all compounds | 2E+4 | 8E+4 | 3E-5 | 1E-7 | 3E-4 3E-3 |
| 94 | Plutonium-234 | W, all compounds except PuO | 8E+3 | 2E+2 | 9E-8 | 3E-10 | 1E-4 1E-3 |
| | | Y, PuO | - | 2E+2 | 8E-8 | 3E-10 | - - |
| 94 | Plutonium-235 ² | W, see ²³⁴ Pu | 9E+5 | 3E+6 | 1E-3 | 4E-6 | 1E-2 1E-1 |
| | | Y, see ²³⁴ Pu | - | 3E+6 | 1E-3 | 3E-6 | - - |
| 94 | Plutonium-236 | W, see ²³⁴ Pu | 2E+0 Bone surf (4E+0) | 2E-2 Bone surf (4E-2) | 8E-12 - | - 5E-14 | - 6E-8 6E-7 |
| | | Y, see ²³⁴ Pu | - | 4E-2 | 2E-11 | 6E-14 | - - |
| 94 | Plutonium-237 | W, see ²³⁴ Pu | 1E+4 | 3E+3 | 1E-6 | 5E-9 | 2E-4 2E-3 |
| | | Y, see ²³⁴ Pu | - | 3E+3 | 1E-6 | 4E-9 | - - |
| 94 | Plutonium-238 | W, see ²³⁴ Pu | 9E-1 Bone surf (2E+0) | 7E-3 Bone surf (1E-2) | 3E-12 - | - 2E-14 | - 2E-8 2E-7 |
| | | Y, see ²³⁴ Pu | - | 2E-2 | 8E-12 | 2E-14 | - - |
| 94 | Plutonium-239 | W, see ²³⁴ Pu | 8E-1 Bone surf (1E+0) | 6E-3 Bone surf (1E-2) | 3E-12 - | - 2E-14 | - 2E-8 2E-7 |
| | | Y, see ²³⁴ Pu | - | 2E-2 Bone surf (2E-2) | 7E-12 - | - 2E-14 | - - |
| 94 | Plutonium-240 | W, see ²³⁴ Pu | 8E-1 Bone surf (1E+0) | 6E-3 Bone surf (1E-2) | 3E-12 - | - 2E-14 | - 2E-8 2E-7 |
| | | Y, see ²³⁴ Pu | - | 2E-2 Bone surf (2E-2) | 7E-12 - | - 2E-14 | - - |
| 94 | Plutonium-241 | W, see ²³⁴ Pu | 4E+1 Bone surf (7E+1) | 3E-1 Bone surf (6E-1) | 1E-10 - | - 8E-13 | - 1E-6 1E-5 |
| | | Y, see ²³⁴ Pu | - | 8E-1 Bone surf (1E+0) | 3E-10 - | - 1E-12 | - - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | | |
|--------------------------|----------------------------|--------------------------------|---|-----------------------------|-------------------------------------|----------------|--|------|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | | |
| 94 | Plutonium-242 | W, see ²³⁴ Pu | 8E-1 Bone surf (1E+0) | 7E-3 Bone surf (1E-2) | 3E-12 | - | - | 2E-7 | |
| | | Y, see ²³⁴ Pu | - | 2E-2 Bone surf (2E-2) | 7E-12 | - | - | - | |
| 94 | Plutonium-243 | W, see ²³⁴ Pu | 2E+4 | 4E+4 | 2E-5 | 5E-8 | 2E-4 | 2E-3 | |
| | | Y, see ²³⁴ Pu | - | 4E+4 | 2E-5 | 5E-8 | - | - | |
| 94 | Plutonium-244 | W, see ²³⁴ Pu | 8E-1 Bone surf (2E+0) | 7E-3 Bone surf (1E-2) | 3E-12 | - | 2E-14 | 2E-8 | 2E-7 |
| | | Y, see ²³⁴ Pu | - | 2E-2 Bone surf (2E-2) | 7E-12 | - | - | - | |
| 94 | Plutonium-245 | W, see ²³⁴ Pu | 2E+3 | 5E+3 | 2E-6 | 6E-9 | 3E-5 | 3E-4 | |
| | | Y, see ²³⁴ Pu | - | 4E+3 | 2E-6 | 6E-9 | - | - | |
| 94 | Plutonium-246 | W, see ²³⁴ Pu | 4E+2 LLI wall (4E+2) | 3E+2 | 1E-7 | 4E-10 | - | 6E-6 | 6E-5 |
| | | Y, see ²³⁴ Pu | - | 3E+2 | 1E-7 | 4E-10 | - | - | |
| 95 | Americium-237 ² | W, all compounds | 8E+4 | 3E+5 | 1E-4 | 4E-7 | 1E-3 | 1E-2 | |
| 95 | Americium-238 ² | W, all compounds | 4E+4 | 3E+3 Bone surf (6E+3) | 1E-6 | - | 5E-4 | 5E-3 | |
| 95 | Americium-239 | W, all compounds | 5E+3 | 1E+4 | 5E-6 | 2E-8 | 7E-5 | 7E-4 | |
| 95 | Americium-240 | W, all compounds | 2E+3 | 3E+3 | 1E-6 | 4E-9 | 3E-5 | 3E-4 | |
| 95 | Americium-241 | W, all compounds | 8E-1 Bone surf (1E+0) | 6E-3 Bone surf (1E-2) | 3E-12 | - | - | - | |
| 95 | Americium-242m | W, all compounds | 8E-1 Bone surf (1E+0) | 6E-3 Bone surf (1E-2) | 3E-12 | - | - | - | |
| 95 | Americium-242 | W, all compounds | 4E+3 | 8E+1 Bone surf (9E+1) | 4E-8 | - | 5E-5 | 5E-4 | |
| 95 | Americium-243 | W, all compounds | 8E-1 Bone surf (1E+0) | 6E-3 Bone surf (1E-2) | 3E-12 | - | - | - | |
| | | | | | | 2E-14 | 2E-8 | 2E-7 | |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------------|------------------|--------------------------------|-----------------------------------|--------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | |
| 95 Americium-244m ² | W, all compounds | 6E+4 | 4E+3 | 2E-6 | - | - | - |
| | | St wall | Bone surf | | | | |
| | | (8E+4) | (7E+3) | - | 1E-8 | 1E-3 | 1E-2 |
| 95 Americium-244 | W, all compounds | 3E+3 | 2E+2 | 8E-8 | - | 4E-5 | 4E-4 |
| | | | Bone surf | | | | |
| | | - | (3E+2) | - | 4E-10 | - | - |
| 95 Americium-245 | W, all compounds | 3E+4 | 8E+4 | 3E-5 | 1E-7 | 4E-4 | 4E-3 |
| 95 Americium-246m ² | W, all compounds | 5E+4 | 2E+5 | 8E-5 | 3E-7 | - | - |
| | | St wall | | | | | |
| | | (6E+4) | - | - | - | 8E-4 | 8E-3 |
| 95 Americium-246 ² | W, all compounds | 3E+4 | 1E+5 | 4E-5 | 1E-7 | 4E-4 | 4E-3 |
| 96 Curium-238 | W, all compounds | 2E+4 | 1E+3 | 5E-7 | 2E-9 | 2E-4 | 2E-3 |
| 96 Curium-240 | W, all compounds | 6E+1 | 6E-1 | 2E-10 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (8E+1) | (6E-1) | - | 9E-13 | 1E-6 | 1E-5 |
| 96 Curium-241 | W, all compounds | 1E+3 | 3E+1 | 1E-8 | - | 2E-5 | 2E-4 |
| | | | Bone surf | | | | |
| | | - | (4E+1) | - | 5E-11 | - | - |
| 96 Curium-242 | W, all compounds | 3E+1 | 3E-1 | 1E-10 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (5E+1) | (3E-1) | - | 4E-13 | 7E-7 | 7E-6 |
| 96 Curium-243 | W, all compounds | 1E+0 | 9E-3 | 4E-12 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (2E+0) | (2E-2) | - | 2E-14 | 3E-8 | 3E-7 |
| 96 Curium-244 | W, all compounds | 1E+0 | 1E-2 | 5E-12 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (3E+0) | (2E-2) | - | 3E-14 | 3E-8 | 3E-7 |
| 96 Curium-245 | W, all compounds | 7E-1 | 6E-3 | 3E-12 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (1E+0) | (1E-2) | - | 2E-14 | 2E-8 | 2E-7 |
| 96 Curium-246 | W, all compounds | 7E-1 | 6E-3 | 3E-12 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (1E+0) | (1E-2) | - | 2E-14 | 2E-8 | 2E-7 |
| 96 Curium-247 | W, all compounds | 8E-1 | 6E-3 | 3E-12 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (1E+0) | (1E-2) | - | 2E-14 | 2E-8 | 2E-7 |
| 96 Curium-248 | W, all compounds | 2E-1 | 2E-3 | 7E-13 | - | - | - |
| | | Bone surf | Bone surf | | | | |
| | | (4E-1) | (3E-3) | - | 4E-15 | 5E-9 | 5E-8 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|------------------------------|---|---|-------------------|-------------------------------------|--------------------------------|---|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration ($\mu\text{Ci/ml}$) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC ($\mu\text{Ci/ml}$) | | Air ($\mu\text{Ci/ml}$) | Water ($\mu\text{Ci/ml}$) | | |
| 96 | Curium-249 ² | W, all compounds | 5E+4 | 2E+4 Bone surf | 7E-6 | - | 7E-4 | 7E-3 |
| | | | - | (3E+4) | - | 4E-8 | - | - |
| 96 | Curium-250 | W, all compounds | 4E-2 Bone surf | 3E-4 Bone surf | 1E-13 | - | - | - |
| | | | (6E-2) | (5E-4) | - | 8E-16 | 9E-10 | 9E-9 |
| 97 | Berkelium-245 | W, all compounds | 2E+3 | 1E+3 | 5E-7 | 2E-9 | 3E-5 | 3E-4 |
| 97 | Berkelium-246 | W, all compounds | 3E+3 | 3E+3 | 1E-6 | 4E-9 | 4E-5 | 4E-4 |
| 97 | Berkelium-247 | W, all compounds | 5E-1 Bone surf | 4E-3 Bone surf | 2E-12 | - | - | - |
| | | | (1E+0) | (9E-3) | - | 1E-14 | 2E-8 | 2E-7 |
| 97 | Berkelium-249 | W, all compounds | 2E+2 Bone surf | 2E+0 Bone surf | 7E-10 | - | - | - |
| | | | (5E+2) | (4E+0) | - | 5E-12 | 6E-6 | 6E-5 |
| 97 | Berkelium-250 | W, all compounds | 9E+3 | 3E+2 Bone surf | 1E-7 | - | 1E-4 | 1E-3 |
| | | | - | (7E+2) | - | 1E-9 | - | - |
| 98 | Californium-244 ² | W, all compounds except those given for Y | 3E+4 St wall | 6E+2 | 2E-7 | 8E-10 | - | - |
| | | | (3E+4) | - | - | - | 4E-4 | 4E-3 |
| | | Y, oxides and hydroxides | - | 6E+2 | 2E-7 | 8E-10 | - | - |
| 98 | Californium-246 | W, see ²⁴⁴ Cf | 4E+2 | 9E+0 | 4E-9 | 1E-11 | 5E-6 | 5E-5 |
| | | Y, see ²⁴⁴ Cf | - | 9E+0 | 4E-9 | 1E-11 | - | - |
| 98 | Californium-248 | W, see ²⁴⁴ Cf | 8E+0 Bone surf | 6E-2 Bone surf | 3E-11 | - | - | - |
| | | | (2E+1) | (1E-1) | - | 2E-13 | 2E-7 | 2E-6 |
| | | Y, see ²⁴⁴ Cf | - | 1E-1 | 4E-11 | 1E-13 | - | - |
| 98 | Californium-249 | W, see ²⁴⁴ Cf | 5E-1 Bone surf | 4E-3 Bone surf | 2E-12 | - | - | - |
| | | | (1E+0) | (9E-3) | - | 1E-14 | 2E-8 | 2E-7 |
| | | Y, see ²⁴⁴ Cf | - | 1E-2 Bone surf | 4E-12 | - | - | - |
| | | | - | (1E-2) | - | 2E-14 | - | - |
| 98 | Californium-250 | W, see ²⁴⁴ Cf | 1E+0 Bone surf | 9E-3 Bone surf | 4E-12 | - | - | - |
| | | | (2E+0) | (2E-2) | - | 3E-14 | 3E-8 | 3E-7 |
| | | Y, see ²⁴⁴ Cf | - | 3E-2 | 1E-11 | 4E-14 | - | - |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers | |
|--------------------------|------------------|--------------------------------|---|-----------------------------|-------------------------------------|----------------|--|------|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) | |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | | |
| 98 | Californium-251 | W, see ²⁴⁴ Cf | 5E-1 Bone surf (1E+0) | 4E-3 Bone surf (9E-3) | 2E-12 | - | - | - |
| | | Y, see ²⁴⁴ Cf | - | 1E-2 Bone surf (1E-2) | 4E-12 | - | - | - |
| 98 | Californium-252 | W, see ²⁴⁴ Cf | 2E+0 Bone surf (5E+0) | 2E-2 Bone surf (4E-2) | 8E-12 | - | - | - |
| | | Y, see ²⁴⁴ Cf | - | 3E-2 | 1E-11 | 5E-14 | - | - |
| 98 | Californium-253 | W, see ²⁴⁴ Cf | 2E+2 Bone surf (4E+2) | 2E+0 | 8E-10 | 3E-12 | - | - |
| | | Y, see ²⁴⁴ Cf | - | 2E+0 | 7E-10 | 2E-12 | - | - |
| 98 | Californium-254 | W, see ²⁴⁴ Cf | 2E+0 | 2E-2 | 9E-12 | 3E-14 | 3E-8 | 3E-7 |
| | | Y, see ²⁴⁴ Cf | - | 2E-2 | 7E-12 | 2E-14 | - | - |
| 99 | Einsteinium-250 | W, all compounds | 4E+4 Bone surf (1E+3) | 5E+2 | 2E-7 | - | 6E-4 | 6E-3 |
| 99 | Einsteinium-251 | W, all compounds | 7E+3 | 9E+2 Bone surf (1E+3) | 4E-7 | - | 1E-4 | 1E-3 |
| 99 | Einsteinium-253 | W, all compounds | 2E+2 | 1E+0 | 6E-10 | 2E-12 | 2E-6 | 2E-5 |
| 99 | Einsteinium-254m | W, all compounds | 3E+2 LLI wall (3E+2) | 1E+1 | 4E-9 | 1E-11 | - | - |
| 99 | Einsteinium-254 | W, all compounds | 8E+0 Bone surf (2E+1) | 7E-2 Bone surf (1E-1) | 3E-11 | - | 4E-6 | 4E-5 |
| 100 | Fermium-252 | W, all compounds | 5E+2 | 1E+1 | 5E-9 | 2E-11 | 6E-6 | 6E-5 |
| 100 | Fermium-253 | W, all compounds | 1E+3 | 1E+1 | 4E-9 | 1E-11 | 1E-5 | 1E-4 |
| 100 | Fermium-254 | W, all compounds | 3E+3 | 9E+1 | 4E-8 | 1E-10 | 4E-5 | 4E-4 |
| 100 | Fermium-255 | W, all compounds | 5E+2 | 2E+1 | 9E-9 | 3E-11 | 7E-6 | 7E-5 |
| 100 | Fermium-257 | W, all compounds | 2E+1 Bone surf (4E+1) | 2E-1 Bone surf (2E-1) | 7E-11 | - | - | - |
| 101 | Mendelevium-257 | W, all compounds | 7E+3 | 8E+1 Bone surf | 4E-8 | - | 1E-4 | 1E-3 |

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--------------------------|---|--------------------------------|------------------|--------------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion | INHALATION | | Air (μCi/ml) | Water (μCi/ml) | |
| | | ALI (μCi) | ALI (μCi) | DAC (μCi/ml) | | | |
| | | - | (9E+1) | - | 1E-10 | - | - |
| 101 | Mendelevium-258 | 3E+1 | 2E-1 | 1E-10 | - | - | - |
| | W, all compounds | Bone surf (5E+1) | Bone surf (3E-1) | - | 5E-13 | 6E-7 | 6E-6 |
| | - Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours | | | | | | |
| | Submersion ¹ | - | 2E+2 | 1E-7 | 1E-9 | - | - |
| | - Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours | - | 2E-1 | 1E-10 | 1E-12 | 1E-8 | 1E-7 |
| | - Any single radionuclide not listed above that decays by alpha emission or spontaneous fission, or any mixture for which either the identity or the concentration of any radio-nuclide in the mixture is not known | - | 4E-4 | 2E-13 | 1E-15 | 2E-9 | 2E-8 |

FOOTNOTES:

¹“Submersion” means that values given are for submersion in a hemispherical semi-infinite cloud of airborne material.

²These radionuclides have radiological half-lives of less than 2 hours. The total effective dose equivalent received during operations with these radionuclides might include a significant contribution from external exposure. The DAC values for all radionuclides, other than those designated Class “Submersion,” are based upon the committed effective dose equivalent due to the intake of the radionuclide into the body and do NOT include potentially significant contributions to dose equivalent from external exposures. The licensee may substitute 1E-7 μCi/ml for the listed DAC to account for the submersion dose prospectively, but should use individual monitoring devices or other radiation measuring instruments that measure external exposure to demonstrate compliance with the limits. (see 40.17)

³For soluble mixtures of U-238, U-234, and U-235 in air, chemical toxicity may be the limiting factor (see 40.15(5)). If the percent by weight (enrichment) of U-235 is not greater than 5, the concentration value for a 40-hour workweek is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed 8E-3 (SA) μCi-hr/ml, where SA is the specific activity of the uranium inhaled. The specific activity for natural uranium is 6.77E-7 curies per gram U. The specific activity for other mixtures of U-238, U-235, and U-234, if not known, shall be:

$$SA = 3.6E-7 \text{ curies/gram U U-depleted}$$

$$SA = [0.4 + 0.38 (\text{enrichment}) + 0.0034 (\text{enrichment})^2] E-6, \text{ enrichment} \geq 0.72$$

where enrichment is the percentage by weight of U-235, expressed as percent.

NOTE:

1. If the identity of each radionuclide in a mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.

2. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in this appendix are not present in the mixture, the inhalation ALI, DAC, and effluent and sewage concentrations for the mixture are the lowest values specified in this appendix for any radionuclide that is not known to be absent from the mixture; or

If it is known that Ac-227-D and Cm-250-W are not present

| | | | | | |
|---|------|-------|---|---|---|
| - | 7E-4 | 3E-13 | - | - | - |
|---|------|-------|---|---|---|

If, in addition, it is known that Ac-227-W,Y, Th-229-W,Y, Th-230-W, Th-232-W,Y, Pa-231-W,Y, Np-237-W, Pu-239-W, Pu-240-W, Pu-242-W, Am-241-W, Am-242m-W, Am-243-W, Cm-245-W, Cm-246-W, Cm-247-W, Cm-248-W, Bk-247-W, Cf-249-W, and Cf-251-W are not present

| | | | | | |
|---|------|-------|---|---|---|
| - | 7E-3 | 3E-12 | - | - | - |
|---|------|-------|---|---|---|

If, in addition, it is known that Sm-146-W, Sm-147-W, Gd-148-D,W, Gd-152-D,W, Th-228-W,Y, Th-230-Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, Np-236-W, Pu-236-W,Y, Pu-238-W,Y, Pu-239-Y, Pu-240-Y, Pu-242-Y, Pu-244-W,Y, Cm-243-W, Cm-244-W, Cf-248-W, Cf-249-Y, Cf-250-W,Y, Cf-251-Y, Cf-252-W,Y, and Cf-254-W,Y are not present

| | | | | | |
|---|------|-------|---|---|---|
| - | 7E-2 | 3E-11 | - | - | - |
|---|------|-------|---|---|---|

| Atomic Radio-nuclide No. | Class | Table I Occupational Values | | | Table II Effluent Concentrations | | Table III Releases to Sewers |
|--|-------|--------------------------------|-----------------------------------|--------|-------------------------------------|----------------|--|
| | | Col. 1 | Col. 2 | Col. 3 | Col. 1 | Col. 2 | Monthly Average Concentration (μCi/ml) |
| | | Oral Ingestion ALI (μCi) | INHALATION ALI (μCi) DAC (μCi/ml) | | Air (μCi/ml) | Water (μCi/ml) | |
| If, in addition, it is known that Pb-210-D, Bi-210m-W, Po-210-D,W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D,W,Y, Th-227-W,Y, U-230-D,W,Y, U-232-D,W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-Y, Es-254-W, Fm-257-W, and Md-258-W are not present | | | | | | | |
| | | - | 7E-1 | 3E-10 | - | - | - |
| If, in addition, it is known that Si-32-Y, Ti-44-Y, Fe-60-D, Sr-90-Y, Zr-93-D,Cd-113m-D, Cd-113-D, In-115-D,W, La-138-D, Lu-176-W, Hf-178m-D,W, Hf-182-D,W, Bi-210m-D, Ra-224-W, Ra-228-W, Ac-226-D,W,Y, Pa-230-W,Y, U-233-D,W, U-234-D,W, U-235-D, W, U-236-D,W, U-238-D,W, Pu-241-Y, Bk-249-W, Cf-253-W,Y, and Es-253-W are not present | | | | | | | |
| | | - | 7E+0 | 3E-9 | - | - | - |
| If it is known that Ac-227-D,W,Y, Th-229-W,Y, Th-232-W,Y, Pa-231-W, Y, Cm-248-W, and Cm-250-W are not present | | | | | | | |
| | | - | - | - | - | 1E-14 | - |
| If, in addition, it is known that Sm-146-W, Gd-148-D,W, Gd-152-D, Th-228-W,Y, Th-230-W,Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, U-Nat-Y, Np-236-W, Np-237-W, Pu-236-W,Y, Pu-238-W,Y, Pu-239-W,Y, Pu-240-W,Y, Pu-242-W,Y, Pu-244-W,Y, Am-241-W, Am-242m-W, Am-243-W, Cm-243-W, Cm-244-W, Cm-245-W, Cm-246-W, Cm-247-W, Bk-247-W, Cf-249-W,Y, Cf-250-W,Y, Cf-251-W,Y, Cf-252-W,Y, and Cf-254-W,Y are not present | | | | | | | |
| | | - | - | - | 1E-13 | - | - |
| If, in addition, it is known that Sm-147-W, Gd-152-W, Pb-210-D, Bi-210m-W, Po-210-D,W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D, W,Y, Th-227-W,Y, U-230-D,W,Y, U-232-D,W, U-Nat-W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-W,Y, Es-254-W, Fm-257-W, and Md-258-W are not present | | | | | | | |
| | | - | - | - | - | 1E-12 | - |
| If, in addition it is known that Fe-60, Sr-90, Cd-113m, Cd-113, In-115, I-129, Cs-134, Sm-145, Sm-147, Gd-148, Gd-152, Hg-194 (organic), Bi-210m, Ra-223, Ra-224, Ra-225, Ac-225, Th-228, Th-230, U-233, U-234, U-235, U-236, U-238, U-Nat, Cm-242, Cf-248, Es-254, Fm-257, and Md-258 are not present | | | | | | | |
| | | - | - | - | - | 1E-6 | 1E-5 |

3. If a mixture of radionuclides consists of uranium and its daughters in ore dust (10 μm AMAD particle distribution assumed) prior to chemical separation of the uranium from the ore, the following values may be used for the DAC of the mixture: 6E-11 μCi of gross alpha activity from uranium-238, uranium-234, thorium-230, and radium-226 per milliliter of air; 3E-11 μCi of natural uranium per milliliter of air; or 45 micrograms of natural uranium per cubic meter of air.

4. If the identity and concentration of each radionuclide in a mixture are known, the limiting values should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in Appendix B, Chapter 40 for the specific radionuclide when not in a mixture. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity").

EXAMPLE: If radionuclides "A," "B," and "C" are present in concentrations C_A, C_B, and C_C, and if the applicable DACs are DAC_A, DAC_B, and DAC_C, respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{DAC_A} + \frac{C_B}{DAC_B} + \frac{C_C}{DAC_C} \leq 1$$

[ARC 8982B, IAB 8/11/10, effective 9/15/10]

CHAPTER 40

APPENDIX C

QUANTITIES¹ OF LICENSED OR REGISTERED MATERIAL REQUIRING LABELING

| Radionuclide | Quantity (μ Ci)* | Radionuclide | Quantity (μ Ci)* |
|---------------|--------------------------|---------------|--------------------------|
| Hydrogen-3 | 1,000 | Chromium-48 | 1,000 |
| Beryllium-7 | 1,000 | Chromium-49 | 1,000 |
| Beryllium-10 | 1 | Chromium-51 | 1,000 |
| Carbon-11 | 1,000 | Manganese-51 | 1,000 |
| Carbon-14 | 100 | Manganese-52m | 1,000 |
| Fluorine-18 | 1,000 | Manganese-52 | 100 |
| Sodium-22 | 10 | Manganese-53 | 1,000 |
| Sodium-24 | 100 | Manganese-54 | 100 |
| Magnesium-28 | 100 | Manganese-56 | 1,000 |
| Aluminum-26 | 10 | Iron-52 | 100 |
| Silicon-31 | 1,000 | Iron-55 | 100 |
| Silicon-32 | 1 | Iron-59 | 10 |
| Phosphorus-32 | 10 | Iron-60 | 1 |
| Phosphorus-33 | 100 | Cobalt-55 | 100 |
| Sulfur-35 | 100 | Cobalt-56 | 10 |
| Chlorine-36 | 10 | Cobalt-57 | 100 |
| Chlorine-38 | 1,000 | Cobalt-58m | 1,000 |
| Chlorine-39 | 1,000 | Cobalt-58 | 100 |
| Argon-39 | 1,000 | Cobalt-60m | 1,000 |
| Argon-41 | 1,000 | Cobalt-60 | 1 |
| Potassium-40 | 100 | Cobalt-61 | 1,000 |
| Potassium-42 | 1,000 | Cobalt-62m | 1,000 |
| Potassium-43 | 1,000 | Nickel-56 | 100 |
| Potassium-44 | 1,000 | Nickel-57 | 100 |
| Potassium-45 | 1,000 | Nickel-59 | 100 |
| Calcium-41 | 100 | Nickel-63 | 100 |
| Calcium-45 | 100 | Nickel-65 | 1,000 |
| Calcium-47 | 100 | Nickel-66 | 10 |
| Scandium-43 | 1,000 | Copper-60 | 1,000 |
| Scandium-44m | 100 | Copper-61 | 1,000 |
| Scandium-44 | 100 | Copper-64 | 1,000 |
| Scandium-46 | 10 | Copper-67 | 1,000 |
| Scandium-47 | 100 | Zinc-62 | 100 |
| Scandium-48 | 100 | Zinc-63 | 1,000 |
| Scandium-49 | 1,000 | Zinc-65 | 10 |
| Titanium-44 | 1 | Zinc-69m | 100 |

| | | | |
|--------------|-------|---------------|-------|
| Titanium-45 | 1,000 | Zinc-69 | 1,000 |
| Vanadium-47 | 1,000 | Zinc-71m | 1,000 |
| Vanadium-48 | 100 | Zinc-72 | 100 |
| Vanadium-49 | 1,000 | Gallium-65 | 1,000 |
| Gallium-66 | 100 | Krypton-81 | 1,000 |
| Gallium-67 | 1,000 | Krypton-83m | 1,000 |
| Gallium-68 | 1,000 | Krypton-85m | 1,000 |
| Gallium-70 | 1,000 | Krypton-85 | 1,000 |
| Gallium-72 | 100 | Krypton-87 | 1,000 |
| Gallium-73 | 1,000 | Krypton-88 | 1,000 |
| Germanium-66 | 1,000 | Rubidium-79 | 1,000 |
| Germanium-67 | 1,000 | Rubidium-81m | 1,000 |
| Germanium-68 | 10 | Rubidium-81 | 1,000 |
| Germanium-69 | 1,000 | Rubidium-82m | 1,000 |
| Germanium-71 | 1,000 | Rubidium-83 | 100 |
| Germanium-75 | 1,000 | Rubidium-84 | 100 |
| Germanium-77 | 1,000 | Rubidium-86 | 100 |
| Germanium-78 | 1,000 | Rubidium-87 | 100 |
| Arsenic-69 | 1,000 | Rubidium-88 | 1,000 |
| Arsenic-70 | 1,000 | Rubidium-89 | 1,000 |
| Arsenic-71 | 100 | Strontium-80 | 100 |
| Arsenic-72 | 100 | Strontium-81 | 1,000 |
| Arsenic-73 | 100 | Strontium-83 | 100 |
| Arsenic-74 | 100 | Strontium-85m | 1,000 |
| Arsenic-76 | 100 | Strontium-85 | 100 |
| Arsenic-77 | 100 | Strontium-87m | 1,000 |
| Arsenic-78 | 1,000 | Strontium-89 | 10 |
| Selenium-70 | 1,000 | Strontium-90 | 0.1 |
| Selenium-73m | 1,000 | Strontium-91 | 100 |
| Selenium-73 | 100 | Strontium-92 | 100 |
| Selenium-75 | 100 | Yttrium-86m | 1,000 |
| Selenium-79 | 100 | Yttrium-86 | 100 |
| Selenium-81m | 1,000 | Yttrium-87 | 100 |
| Selenium-81 | 1,000 | Yttrium-88 | 10 |
| Selenium-83 | 1,000 | Yttrium-90m | 1,000 |
| Bromine-74m | 1,000 | Yttrium-90 | 10 |
| Bromine-74 | 1,000 | Yttrium-91m | 1,000 |
| Bromine-75 | 1,000 | Yttrium-91 | 10 |
| Bromine-76 | 100 | Yttrium-92 | 100 |
| Bromine-77 | 1,000 | Yttrium-93 | 100 |
| Bromine-80m | 1,000 | Yttrium-94 | 1,000 |
| Bromine-80 | 1,000 | Yttrium-95 | 1,000 |

| | | | |
|----------------|-------|---------------|-------|
| Bromine-82 | 100 | Zirconium-86 | 100 |
| Bromine-83 | 1,000 | Zirconium-88 | 10 |
| Bromine-84 | 1,000 | Zirconium-89 | 100 |
| Krypton-74 | 1,000 | Zirconium-93 | 1 |
| Krypton-76 | 1,000 | Zirconium-95 | 10 |
| Krypton-77 | 1,000 | Zirconium-97 | 100 |
| Krypton-79 | 1,000 | | |
| Niobium-88 | 1,000 | Palladium-101 | 1,000 |
| Niobium-89m | | Palladium-103 | 100 |
| (66 min) | 1,000 | Palladium-107 | 10 |
| Niobium-89 | | Palladium-109 | 100 |
| (122 min) | 1,000 | Silver-102 | 1,000 |
| Niobium-90 | 100 | Silver-103 | 1,000 |
| Niobium-93m | 10 | Silver-104m | 1,000 |
| Niobium-94 | 1 | Silver-104 | 1,000 |
| Niobium-95m | 100 | Silver-105 | 100 |
| Niobium-95 | 100 | Silver-106m | 100 |
| Niobium-96 | 100 | Silver-106 | 1,000 |
| Niobium-97 | 1,000 | Silver-108m | 1 |
| Niobium-98 | 1,000 | Silver-110m | 10 |
| Molybdenum-90 | 100 | Silver-111 | 100 |
| Molybdenum-93m | 100 | Silver-112 | 100 |
| Molybdenum-93 | 10 | Silver-115 | 1,000 |
| Molybdenum-99 | 100 | Cadmium-104 | 1,000 |
| Molybdenum-101 | 1,000 | Cadmium-107 | 1,000 |
| Technetium-93m | 1,000 | Cadmium-109 | 1 |
| Technetium-93 | 1,000 | Cadmium-113m | 0.1 |
| Technetium-94m | 1,000 | Cadmium-113 | 100 |
| Technetium-94 | 1,000 | Cadmium-115m | 10 |
| Technetium-96m | 1,000 | Cadmium-115 | 100 |
| Technetium-96 | 100 | Cadmium-117m | 1,000 |
| Technetium-97m | 100 | Cadmium-117 | 1,000 |
| Technetium-97 | 1,000 | Indium-109 | 1,000 |
| Technetium-98 | 10 | Indium-110m | |
| Technetium-99m | 1,000 | (69.1m) | 1,000 |
| Technetium-99 | 100 | Indium-110 | |
| Technetium-101 | 1,000 | (4.9h) | 1,000 |
| Technetium-104 | 1,000 | Indium-111 | 100 |
| Ruthenium-94 | 1,000 | Indium-112 | 1,000 |
| Ruthenium-97 | 1,000 | Indium-113m | 1,000 |
| Ruthenium-103 | 100 | Indium-114m | 10 |
| Ruthenium-105 | 1,000 | Indium-115m | 1,000 |

| | | | |
|---------------|-------|---------------|-------|
| Ruthenium-106 | 1 | Indium-115 | 100 |
| Rhodium-99m | 1,000 | Indium-116m | 1,000 |
| Rhodium-99 | 100 | Indium-117m | 1,000 |
| Rhodium-100 | 100 | Indium-117 | 1,000 |
| Rhodium-101m | 1,000 | Indium-119m | 1,000 |
| Rhodium-101 | 10 | Tin-110 | 100 |
| Rhodium-102m | 10 | Tin-111 | 1,000 |
| Rhodium-102 | 10 | Tin-113 | 100 |
| Rhodium-103m | 1,000 | Tin-117m | 100 |
| Rhodium-105 | 100 | Tin-119m | 100 |
| Rhodium-106m | 1,000 | Tin-121m | 100 |
| Rhodium-107 | 1,000 | Tin-121 | 1,000 |
| Palladium-100 | 100 | | |
| Tin-123m | 1,000 | Tellurium-133 | 1,000 |
| Tin-123 | 10 | Tellurium-134 | 1,000 |
| Tin-125 | 10 | Iodine-120m | 1,000 |
| Tin-126 | 10 | Iodine-120 | 100 |
| Tin-127 | 1,000 | Iodine-121 | 1,000 |
| Tin-128 | 1,000 | Iodine-123 | 100 |
| Antimony-115 | 1,000 | Iodine-124 | 10 |
| Antimony-116m | 1,000 | Iodine-125 | 1 |
| Antimony-116 | 1,000 | Iodine-126 | 1 |
| Antimony-117 | 1,000 | Iodine-128 | 1,000 |
| Antimony-118m | 1,000 | Iodine-129 | 1 |
| Antimony-119 | 1,000 | Iodine-130 | 10 |
| Antimony-120 | | Iodine-131 | 1 |
| (16m) | 1,000 | Iodine-132m | 100 |
| Antimony-120 | | Iodine-132 | 100 |
| (5.76d) | 100 | Iodine-133 | 10 |
| Antimony-122 | 100 | Iodine-134 | 1,000 |
| Antimony-124m | 1,000 | Iodine-135 | 100 |
| Antimony-124 | 10 | Xenon-120 | 1,000 |
| Antimony-125 | 100 | Xenon-121 | 1,000 |
| Antimony-126m | 1,000 | Xenon-122 | 1,000 |
| Antimony-126 | 100 | Xenon-123 | 1,000 |
| Antimony-127 | 100 | Xenon-125 | 1,000 |
| Antimony-128 | | Xenon-127 | 1,000 |
| (10.4m) | 1,000 | Xenon-129m | 1,000 |
| Antimony-128 | | Xenon-131m | 1,000 |
| (9.01h) | 100 | Xenon-133m | 1,000 |
| Antimony-129 | 100 | Xenon-133 | 1,000 |
| Antimony-130 | 1,000 | Xenon-135m | 1,000 |

| | | | |
|----------------|-------|-----------------|-------|
| Antimony-131 | 1,000 | Xenon-135 | 1,000 |
| Tellurium-116 | 1,000 | Xenon-138 | 1,000 |
| Tellurium-121m | 10 | Cesium-125 | 1,000 |
| Tellurium-121 | 100 | Cesium-127 | 1,000 |
| Tellurium-123m | 10 | Cesium-129 | 1,000 |
| Tellurium-123 | 100 | Cesium-130 | 1,000 |
| Tellurium-125m | 10 | Cesium-131 | 1,000 |
| Tellurium-127m | 10 | Cesium-132 | 100 |
| Tellurium-127 | 1,000 | Cesium-134m | 1,000 |
| Tellurium-129m | 10 | Cesium-134 | 10 |
| Tellurium-129 | 1,000 | Cesium-135m | 1,000 |
| Tellurium-131m | 10 | Cesium-135 | 100 |
| Tellurium-131 | 100 | Cesium-136 | 10 |
| Tellurium-132 | 10 | Cesium-137 | 10 |
| Tellurium-133m | 100 | Cesium-138 | 1,000 |
| Barium-126 | 1,000 | Promethium-141 | 1,000 |
| Barium-128 | 100 | Promethium-143 | 100 |
| Barium-131m | 1,000 | Promethium-144 | 10 |
| Barium-131 | 100 | Promethium-145 | 10 |
| Barium-133m | 100 | Promethium-146 | 1 |
| Barium-133 | 100 | Promethium-147 | 10 |
| Barium-135m | 100 | Promethium-148m | 10 |
| Barium-139 | 1,000 | Promethium-148 | 10 |
| Barium-140 | 100 | Promethium-149 | 100 |
| Barium-141 | 1,000 | Promethium-150 | 1,000 |
| Barium-142 | 1,000 | Promethium-151 | 100 |
| Lanthanum-131 | 1,000 | Samarium-141m | 1,000 |
| Lanthanum-132 | 100 | Samarium-141 | 1,000 |
| Lanthanum-135 | 1,000 | Samarium-142 | 1,000 |
| Lanthanum-137 | 10 | Samarium-145 | 100 |
| Lanthanum-138 | 100 | Samarium-146 | 1 |
| Lanthanum-140 | 100 | Samarium-147 | 100 |
| Lanthanum-141 | 100 | Samarium-151 | 10 |
| Lanthanum-142 | 1,000 | Samarium-153 | 100 |
| Lanthanum-143 | 1,000 | Samarium-155 | 1,000 |
| Cerium-134 | 100 | Samarium-156 | 1,000 |
| Cerium-135 | 100 | Europium-145 | 100 |
| Cerium-137m | 100 | Europium-146 | 100 |
| Cerium-137 | 1,000 | Europium-147 | 100 |
| Cerium-139 | 100 | Europium-148 | 10 |
| Cerium-141 | 100 | Europium-149 | 100 |

| | | | |
|-------------------|-------|----------------|-------|
| Cerium-143 | 100 | Europium-150 | |
| Cerium-144 | 1 | (12.62h) | 100 |
| Praseodymium-136 | 1,000 | Europium-150 | |
| Praseodymium-137 | 1,000 | (34.2y) | 1 |
| Praseodymium-138m | 1,000 | Europium-152m | 100 |
| Praseodymium-139 | 1,000 | Europium-152 | 1 |
| Praseodymium-142m | 1,000 | Europium-154 | 1 |
| Praseodymium-142 | 100 | Europium-155 | 10 |
| Praseodymium-143 | 100 | Europium-156 | 100 |
| Praseodymium-144 | 1,000 | Europium-157 | 100 |
| Praseodymium-145 | 100 | Europium-158 | 1,000 |
| Praseodymium-147 | 1,000 | Gadolinium-145 | 1,000 |
| Neodymium-136 | 1,000 | Gadolinium-146 | 10 |
| Neodymium-138 | 100 | Gadolinium-147 | 100 |
| Neodymium-139m | 1,000 | Gadolinium-148 | 0.001 |
| Neodymium-139 | 1,000 | Gadolinium-149 | 100 |
| Neodymium-141 | 1,000 | Gadolinium-151 | 10 |
| Neodymium-147 | 100 | Gadolinium-152 | 100 |
| Neodymium-149 | 1,000 | Gadolinium-153 | 10 |
| Neodymium-151 | 1,000 | Gadolinium-159 | 100 |
| Terbium-147 | 1,000 | Ytterbium-162 | 1,000 |
| Terbium-149 | 100 | Ytterbium-166 | 100 |
| Terbium-150 | 1,000 | Ytterbium-167 | 1,000 |
| Terbium-151 | 100 | Ytterbium-169 | 100 |
| Terbium-153 | 1,000 | Ytterbium-175 | 100 |
| Terbium-154 | 100 | Ytterbium-177 | 1,000 |
| Terbium-155 | 1,000 | Ytterbium-178 | 1,000 |
| Terbium-156m | | Lutetium-169 | 100 |
| (5.0h) | 1,000 | Lutetium-170 | 100 |
| Terbium-156m | | Lutetium-171 | 100 |
| (24.4h) | 1,000 | Lutetium-172 | 100 |
| Terbium-156 | 100 | Lutetium-173 | 10 |
| Terbium-157 | 10 | Lutetium-174m | 10 |
| Terbium-158 | 1 | Lutetium-174 | 10 |
| Terbium-160 | 10 | Lutetium-176m | 1,000 |
| Terbium-161 | 100 | Lutetium-176 | 100 |
| Dysprosium-155 | 1,000 | Lutetium-177m | 10 |
| Dysprosium-157 | 1,000 | Lutetium-177 | 100 |
| Dysprosium-159 | 100 | Lutetium-178m | 1,000 |
| Dysprosium-165 | 1,000 | Lutetium-178 | 1,000 |
| Dysprosium-166 | 100 | Lutetium-179 | 1,000 |
| Holmium-155 | 1,000 | Hafnium-170 | 100 |

| | | | |
|--------------|-------|---------------|-------|
| Holmium-157 | 1,000 | Hafnium-172 | 1 |
| Holmium-159 | 1,000 | Hafnium-173 | 1,000 |
| Holmium-161 | 1,000 | Hafnium-175 | 100 |
| Holmium-162m | 1,000 | Hafnium-177m | 1,000 |
| Holmium-162 | 1,000 | Hafnium-178m | 0.1 |
| Holmium-164m | 1,000 | Hafnium-179m | 10 |
| Holmium-164 | 1,000 | Hafnium-180m | 1,000 |
| Holmium-166m | 1 | Hafnium-181 | 10 |
| Holmium-166 | 100 | Hafnium-182m | 1,000 |
| Holmium-167 | 1,000 | Hafnium-182 | 0.1 |
| Erbium-161 | 1,000 | Hafnium-183 | 1,000 |
| Erbium-165 | 1,000 | Hafnium-184 | 100 |
| Erbium-169 | 100 | Tantalum-172 | 1,000 |
| Erbium-171 | 100 | Tantalum-173 | 1,000 |
| Erbium-172 | 100 | Tantalum-174 | 1,000 |
| Thulium-162 | 1,000 | Tantalum-175 | 1,000 |
| Thulium-166 | 100 | Tantalum-176 | 100 |
| Thulium-167 | 100 | Tantalum-177 | 1,000 |
| Thulium-170 | 10 | Tantalum-178 | 1,000 |
| Thulium-171 | 10 | Tantalum-179 | 100 |
| Thulium-172 | 100 | Tantalum-180m | 1,000 |
| Thulium-173 | 100 | Tantalum-180 | 100 |
| Thulium-175 | 1,000 | Tantalum-182m | 1,000 |
| Tantalum-182 | 10 | Iridium-188 | 100 |
| Tantalum-183 | 100 | Iridium-189 | 100 |
| Tantalum-184 | 100 | Iridium-190m | 1,000 |
| Tantalum-185 | 1,000 | Iridium-190 | 100 |
| Tantalum-186 | 1,000 | Iridium-192m | |
| Tungsten-176 | 1,000 | (1.4m) | 10 |
| Tungsten-177 | 1,000 | Iridium-192 | |
| Tungsten-178 | 1,000 | (73.8d) | 1 |
| Tungsten-179 | 1,000 | Iridium-194m | 10 |
| Tungsten-181 | 1,000 | Iridium-194 | 100 |
| Tungsten-185 | 100 | Iridium-195m | 1,000 |
| Tungsten-187 | 100 | Iridium-195 | 1,000 |
| Tungsten-188 | 10 | Platinum-186 | 1,000 |
| Rhenium-177 | 1,000 | Platinum-188 | 100 |
| Rhenium-178 | 1,000 | Platinum-189 | 1,000 |
| Rhenium-181 | 1,000 | Platinum-191 | 100 |
| Rhenium-182 | | Platinum-193m | 100 |
| (12.7h) | 1,000 | Platinum-193 | 1,000 |

| | | | |
|---------------|-------|---------------|-------|
| Rhenium-182 | | Platinum-195m | 100 |
| (64.0h) | 100 | Platinum-197m | 1,000 |
| Rhenium-184m | 10 | Platinum-197 | 100 |
| Rhenium-184 | 100 | Platinum-199 | 1,000 |
| Rhenium-186m | 10 | Platinum-200 | 100 |
| Rhenium-186 | 100 | Gold-193 | 1,000 |
| Rhenium-187 | 1,000 | Gold-194 | 100 |
| Rhenium-188m | 1,000 | Gold-195 | 10 |
| Rhenium-188 | 100 | Gold-198m | 100 |
| Rhenium-189 | 100 | Gold-198 | 100 |
| Osmium-180 | 1,000 | Gold-199 | 100 |
| Osmium-181 | 1,000 | Gold-200m | 100 |
| Osmium-182 | 100 | Gold-200 | 1,000 |
| Osmium-185 | 100 | Gold-201 | 1,000 |
| Osmium-189m | 1,000 | Mercury-193m | 100 |
| Osmium-191m | 1,000 | Mercury-193 | 1,000 |
| Osmium-191 | 100 | Mercury-194 | 1 |
| Osmium-193 | 100 | Mercury-195m | 100 |
| Osmium-194 | 1 | Mercury-195 | 1,000 |
| Iridium-182 | 1,000 | Mercury-197m | 100 |
| Iridium-184 | 1,000 | Mercury-197 | 1,000 |
| Iridium-185 | 1,000 | Mercury-199m | 1,000 |
| Iridium-186 | 100 | Mercury-203 | 100 |
| Iridium-187 | 1,000 | | |
| Thallium-194m | 1,000 | Francium-223 | 100 |
| Thallium-194 | 1,000 | Radium-223 | 0.1 |
| Thallium-195 | 1,000 | Radium-224 | 0.1 |
| Thallium-197 | 1,000 | Radium-225 | 0.1 |
| Thallium-198m | 1,000 | Radium-226 | 0.1 |
| Thallium-198 | 1,000 | Radium-227 | 1,000 |
| Thallium-199 | 1,000 | Radium-228 | 0.1 |
| Thallium-200 | 1,000 | Actinium-224 | 1 |
| Thallium-201 | 1,000 | Actinium-225 | 0.01 |
| Thallium-202 | 100 | Actinium-226 | 0.1 |
| Thallium-204 | 100 | Actinium-227 | 0.001 |
| Lead-195m | 1,000 | Actinium-228 | 1 |
| Lead-198 | 1,000 | Thorium-226 | 10 |
| Lead-199 | 1,000 | Thorium-227 | 0.01 |
| Lead-200 | 100 | Thorium-228 | 0.001 |
| Lead-201 | 1,000 | Thorium-229 | 0.001 |
| Lead-202m | 1,000 | Thorium-230 | 0.001 |
| Lead-202 | 10 | Thorium-231 | 100 |

| | | | |
|---------------|-------|------------------|-------|
| Lead-203 | 1,000 | Thorium-232 | 100 |
| Lead-205 | 100 | Thorium-234 | 10 |
| Lead-209 | 1,000 | Thorium-natural | 100 |
| Lead-210 | 0.01 | Protactinium-227 | 10 |
| Lead-211 | 100 | Protactinium-228 | 1 |
| Lead-212 | 1 | Protactinium-230 | 0.1 |
| Lead-214 | 100 | Protactinium-231 | 0.001 |
| Bismuth-200 | 1,000 | Protactinium-232 | 1 |
| Bismuth-201 | 1,000 | Protactinium-233 | 100 |
| Bismuth-202 | 1,000 | Protactinium-234 | 100 |
| Bismuth-203 | 100 | Uranium-230 | 0.01 |
| Bismuth-205 | 100 | Uranium-231 | 100 |
| Bismuth-206 | 100 | Uranium-232 | 0.001 |
| Bismuth-207 | 10 | Uranium-233 | 0.001 |
| Bismuth-210m | 0.1 | Uranium-234 | 0.001 |
| Bismuth-210 | 1 | Uranium-235 | 0.001 |
| Bismuth-212 | 10 | Uranium-236 | 0.001 |
| Bismuth-213 | 10 | Uranium-237 | 100 |
| Bismuth-214 | 100 | Uranium-238 | 100 |
| Polonium-203 | 1,000 | Uranium-239 | 1,000 |
| Polonium-205 | 1,000 | Uranium-240 | 100 |
| Polonium-207 | 1,000 | Uranium-natural | 100 |
| Polonium-210 | 0.1 | Neptunium-232 | 100 |
| Astatine-207 | 100 | Neptunium-233 | 1,000 |
| Astatine-211 | 10 | Neptunium-234 | 100 |
| Radon-220 | 1 | Neptunium-235 | 100 |
| Radon-222 | 1 | Neptunium-236 | |
| Francium-222 | 100 | (1.15E+5) | 0.001 |
| Neptunium-236 | | Curium-242 | 0.01 |
| (22.5h) | 1 | Curium-243 | 0.001 |
| Neptunium-237 | 0.001 | Curium-244 | 0.001 |
| Neptunium-238 | 10 | Curium-245 | 0.001 |
| Neptunium-239 | 100 | Curium-246 | 0.001 |
| Neptunium-240 | 1,000 | Curium-247 | 0.001 |
| Plutonium-234 | 10 | Curium-248 | 0.001 |
| Plutonium-235 | 1,000 | Curium-249 | 1,000 |
| Plutonium-236 | 0.001 | Berkelium-245 | 100 |
| Plutonium-237 | 100 | Berkelium-246 | 100 |
| Plutonium-238 | 0.001 | Berkelium-247 | 0.001 |
| Plutonium-239 | 0.001 | Berkelium-249 | 0.1 |
| Plutonium-240 | 0.001 | Berkelium-250 | 10 |
| Plutonium-241 | 0.01 | Californium-244 | 100 |

| | | | |
|---|-------|--|-------|
| Plutonium-242 | 0.001 | Californium-246 | 1 |
| Plutonium-243 | 1,000 | Californium-248 | 0.01 |
| Plutonium-244 | 0.001 | Californium-249 | 0.001 |
| Plutonium-245 | 100 | Californium-250 | 0.001 |
| Americium-237 | 1,000 | Californium-251 | 0.001 |
| Americium-238 | 100 | Californium-252 | 0.001 |
| Americium-239 | 1,000 | Californium-253 | 0.1 |
| Americium-240 | 100 | Californium-254 | 0.001 |
| Americium-241 | 0.001 | Einsteinium-250 | 100 |
| Americium-242m | 0.001 | Einsteinium-251 | 100 |
| Americium-242 | 10 | Einsteinium-253 | 0.1 |
| Americium-243 | 0.001 | Einsteinium-254m | 1 |
| Americium-244m | 100 | Einsteinium-254 | 0.01 |
| Americium-244 | 10 | Fermium-252 | 1 |
| Americium-245 | 1,000 | Fermium-253 | 1 |
| Americium-246m | 1,000 | Fermium-254 | 10 |
| Americium-246 | 1,000 | Fermium-255 | 1 |
| Curium-238 | 100 | Fermium-257 | 0.01 |
| Curium-240 | 0.1 | Mendelevium-257 | 10 |
| Curium-241 | 1 | Mendelevium-258 | 0.01 |
| Any alpha-emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition | 0.001 | Any radionuclide other than alpha-emitting radionuclides not listed above, or mixtures of beta emitters of unknown composition | 0.01 |

*To convert μCi to kBq , multiply the μCi value by 37.

¹The quantities listed above were derived by taking 1/10th of the most restrictive ALI listed in Table I, Columns 1 and 2, of Appendix B to this chapter, rounding to the nearest factor of 10, and constraining the values listed between 37 Bq and 37 MBq (0.001 and 1,000 μCi). Values of 3.7 MBq (100 μCi) have been assigned for radionuclides having a radioactive half-life in excess of E+9 years, except rhenium, 37 MBq (1,000 μCi), to take into account their low specific activity.

NOTE: For purposes of 40.61(5), 40.64(1), and 40.95(1) where there is involved a combination of radionuclides in known amounts, the limit for the combination shall be derived as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific radionuclide when not in combination. The sum of such ratios for all radionuclides in the combination may not exceed "1"—that is, unity.

CHAPTER 40

APPENDIX D

REQUIREMENTS FOR TRANSFERS AND MANIFESTS OF LOW-LEVEL RADIOACTIVE WASTE INTENDED FOR DISPOSAL AT LICENSED LAND DISPOSAL FACILITIES

As used in this appendix, the following definitions apply:

“Chelating agent” means amine polycarboxylic acids (e.g., EDTA, DTPA), hydroxy-carboxylic acids, and polycarboxylic acids (e.g., citric acid, carboric acid, and glucinic acid).

“Chemical description” means a description of the principal chemical characteristics of a low-level radioactive waste.

“Computer-readable medium” means that the regulatory agency’s computer can transfer the information from the medium into its memory.

“Consignee” means the designated receiver of the shipment of low-level radioactive waste.

“Decontamination facility” means a facility operating under an agreement state or Nuclear Regulatory Commission license whose principal purpose is decontamination of equipment or materials to accomplish recycle, reuse, or other waste management objectives and, for purposes of this appendix, is not considered to be a consignee for LLW shipments.

“Disposal container” means a container principally used to confine low-level radioactive waste during disposal operations at a land disposal facility (also see “high integrity container”). Note that for some shipments, the disposal container may be the transport package.

“EPA identification number” means the number received by a transporter following application to the administrator of EPA as required by 40 CFR Part 263.

“Forms 540, 540A, 541, 541A, 542, and 542A” are official forms referenced in this appendix. Licensees need not use originals of these forms as long as any substitute forms are equivalent to the original documentation in respect to content, clarity, size, and location of information. Upon agreement between the shipper and consignee, Forms 541 (and 541A) and Forms 542 (and 542A) may be completed, transmitted, and stored in electronic media. The electronic media must have the capability for producing legible, accurate, and complete records in the format of the uniform manifest.

“Generator” means a licensee operating under an agreement state or Nuclear Regulatory Commission license who (1) is a waste generator as defined in this rule, or (2) is the licensee to whom waste can be attributed within the context of the Low-Level Radioactive Waste Policy Amendments Act of 1985 (e.g., waste generated as a result of decontamination or recycle activities).

“High integrity container (HIC)” means a container commonly designed to meet the structural stability requirements of 10 CFR 61.56, and to meet United States Department of Transportation requirements for a Type A package.

“Land disposal facility” means the land, buildings and structures, and equipment which are intended to be used for the disposal of radioactive wastes. For purposes of this appendix, a “geologic repository” as defined in 10 CFR Part 60 is not considered a land disposal facility.

“Package” means the assembly of components necessary to ensure compliance with the packaging requirements of United States Department of Transportation regulations, together with its radioactive contents, as presented for transport.

“Physical description” means the items called for on Form 541 to describe a low-level radioactive waste.

“Residual waste” means low-level radioactive waste resulting from processing or decontamination activities that cannot be easily separated into distinct batches attributable to specific waste generators. This waste is attributable to the processor or decontamination facility, as applicable.

“Shipper” means the licensed entity (i.e., the waste generator, waste collector, or waste processor) who offers low-level radioactive waste for transportation, typically consigning this type of waste to a licensed waste collector, waste processor, or land disposal facility operator.

“Shipping paper” means Form 540 and, if required, Form 540A which includes the information required by United States Department of Transportation in 49 CFR Part 172.

“Uniform Low-Level Radioactive Waste Manifest” or “uniform manifest” means the combination of Forms 540, 541 and, if necessary, 542, and their respective continuation sheets as needed, or equivalent.

“Waste collector” means an entity, operating under an agreement state or Nuclear Regulatory Commission license, whose principal purpose is to collect and consolidate waste generated by others, and to transfer this waste, without processing or repackaging the collected waste, to another licensed waste collector, licensed waste processor, or licensed land disposal facility.

“Waste description” means the physical, chemical and radiological description of a low-level radioactive waste as called for on Form 541.

“Waste generator” means an entity, operating under an agreement state or Nuclear Regulatory Commission license, who (1) possesses any material or component that contains radioactivity or is radioactively contaminated for which the licensee foresees no further use, and (2) transfers this material or component to a licensed land disposal facility or to a licensed waste collector or processor for handling or treatment prior to disposal. A licensee performing processing or decontamination services may be a “waste generator” if the transfer of low-level radioactive waste from its facility is defined as “residual waste.”

“Waste processor” means an entity, operating under an agreement state or Nuclear Regulatory Commission license, whose principal purpose is to process, repackage, or otherwise treat low-level radioactive material or waste generated by others prior to eventual transfer of waste to a licensed low-level radioactive waste land disposal facility.

“Waste type” means a waste within a disposal container having a unique physical description (i.e., a specific waste descriptor code or description; or a waste sorbed on or solidified in a specifically defined media).

I. Manifest

A waste generator, collector, or processor who transports, or offers for transportation, low-level radioactive waste intended for ultimate disposal at a licensed low-level radioactive waste land disposal facility must prepare a manifest reflecting information requested on applicable Forms 540 (Uniform Low-Level Radioactive Waste Manifest (Shipping Paper)) and 541 (Uniform Low-Level Radioactive Waste Manifest (Container and Waste Description)) and, if necessary, on an applicable Form 542 (Uniform Low-Level Radioactive Waste Manifest (Manifest Index and Regional Compact Tabulation)). Forms 540 and 540A must be completed and must physically accompany the pertinent low-level waste shipment. Upon agreement between shipper and consignee, Forms 541 and 541A and 542 and 542A may be completed, transmitted, and stored in electronic media with the capability for producing legible, accurate, and complete records on the respective forms. Licensees are not required by this agency to comply with the manifesting requirements of this part when they ship:

(a) LLW for processing and expect its return (i.e., for storage under their license) prior to disposal at a licensed land disposal facility;

(b) LLW that is being returned to the licensee who is the “waste generator” or “generator,” as defined in this part; or

(c) Radioactively contaminated material to a “waste processor” that becomes the processor’s “residual waste.”

For guidance in completing these forms, refer to the instructions that accompany the forms. Copies of manifests required by this appendix may be legible carbon copies, photocopies, or computer printouts that reproduce the data in the format of the uniform manifest.

NRC Forms 540, 540A, 541, 541A, 542, and 542A, and the accompanying instructions, in hard copy, may be obtained by writing or calling the Office of the Chief Information Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0111, telephone (301)415-5877 or by visiting the NRC’s website at www.nrc.gov and selecting forms from the index found on the home page.

This appendix includes information requirements of the United States Department of Transportation, as codified in 49 CFR Part 172. Information on hazardous, medical, or other waste required to meet Environmental Protection Agency regulations, as codified in 40 CFR Parts 259, 261, or elsewhere, is not addressed in this section, and must be provided on the required EPA forms. However, the required EPA forms must accompany the Uniform Low-Level Radioactive Waste Manifest required by this chapter.

Information Requirements

A. General Information

The shipper of the radioactive waste shall provide the following information on the uniform manifest:

1. The name, facility's address, and telephone number of the licensee shipping the waste;
2. An explicit declaration indicating whether the shipper is acting as a waste generator, collector, processor, or a combination of these identifiers for purposes of the manifested shipment; and
3. The name, address, and telephone number, or the name and EPA identification number, for the carrier transporting the waste.

B. Shipment Information

The shipper of the radioactive waste shall provide the following information regarding the waste shipment on the uniform manifest:

1. The date of the waste shipment;
2. The total number of packages/disposal containers;
3. The total disposal volume and disposal weight in the shipment;
4. The total radionuclide activity in the shipment;
5. The activity of each of the radionuclides, H-3, C-14, Tc-99, and I-129 contained in the shipment; and
6. The total masses of U-233, U-235, and plutonium in special nuclear material, and the total mass of uranium and thorium in source material.

C. Disposal Container and Waste Information

The shipper of the radioactive waste shall provide the following information on the uniform manifest regarding the waste and each disposal container of waste in the shipment:

1. An alphabetic or numeric identification that uniquely identifies each disposal container in the shipment;
2. A physical description of the disposal container, including the manufacturer and model of any high integrity container;
3. The volume displaced by the disposal container;
4. The gross weight of the disposal container, including the waste;
5. For waste consigned to a disposal facility, the maximum radiation level at the surface of each disposal container;
6. A physical and chemical description of the waste;
7. The total weight percentage of chelating agent for any waste containing more than 0.1 percent chelating agent by weight, plus the identity of the principal chelating agent;
8. The approximate volume of waste within a container;
9. The sorbing or solidification media, if any, and the identity of the solidification media vendor and brand name;
10. The identities and activities of individual radionuclides contained in each container, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material. For discrete waste types (i.e., activated materials, contaminated equipment, mechanical filters, sealed source/devices, and wastes in solidification/stabilization media), the identities and activities of individual radionuclides associated with or contained in these waste types within a disposal container shall be reported;
11. The total radioactivity within each container; and
12. For wastes consigned to a disposal facility, the classification of the waste pursuant to 10 CFR 61.55. Waste not meeting the structural stability requirements of 10 CFR 61.56(b) must be identified.

D. Uncontainerized Waste Information

The shipper of the radioactive waste shall provide the following information on the uniform manifest regarding a waste shipment delivered without a disposal container:

1. The approximate volume and weight of the waste;
2. A physical and chemical description of the waste;
3. The total weight percentage of chelating agent if the chelating agent exceeds 0.1 percent by weight, plus the identity of the principal chelating agent;

4. For waste consigned to a disposal facility, the classification of the waste pursuant to 10 CFR 61.55. Waste not meeting the structural stability requirements of 10 CFR 61.56(b) must be identified;

5. The identities and activities of individual radionuclides contained in the waste, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material; and

6. For wastes consigned to a disposal facility, the maximum radiation levels at the surface of the waste.

E. Multigenerator Disposal Container Information

This section applies to disposal containers enclosing mixtures of waste originating from different generators. (Note: The origin of the LLW resulting from a processor's activities may be attributable to one or more "generators" (including "waste generators") as defined in this appendix.) It also applies to mixtures of wastes shipped in an uncontainerized form, for which portions of the mixture within the shipment originate from different generators.

1. For homogeneous mixtures of waste, such as incinerator ash, provide the waste description applicable to the mixture and the volume of the waste attributed to each generator.

2. For heterogeneous mixtures of waste, such as the combined products from a large compactor, identify each generator contributing waste to the disposal container and, for discrete waste types (i.e., activated materials, contaminated equipment, mechanical filters, sealed source/devices, and wastes in solidification/stabilization media), the identities and activities of individual radionuclides contained in these waste types within the disposal container. For each generator, provide the following:

(a) The volume of waste within the disposal container;

(b) A physical and chemical description of the waste, including the solidification agent, if any;

(c) The total weight percentage of chelating agents for any disposal container containing more than 0.1 percent chelating agent by weight, plus the identity of the principal chelating agent;

(d) The sorbing or solidification media, if any, and the identity of the solidification media vendor and brand name if the media is claimed to meet stability requirements in 10 CFR 61.56(b); and

(e) Radionuclide identities and activities contained in the waste, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material if contained in the waste.

II. Certification

An authorized representative of the waste generator, processor, or collector shall certify by signing and dating the shipment manifest that the transported materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the United States Department of Transportation and this agency. A collector in signing the certification is certifying that nothing has been done to the collected waste that would invalidate the waste generator's certification.

III. Control and Tracking

A. Any licensee who transfers radioactive waste to a land disposal facility or a licensed waste collector shall comply with the requirements in paragraphs A.1. through A.9. of this appendix. Any licensee who transfers waste to a licensed waste processor for waste treatment or repackaging shall comply with the requirements of paragraphs A.4. through A.9. of this appendix. A licensee shall:

1. Prepare all wastes so that the waste is classified according to 10 CFR 61.55 and meets the waste characteristics requirements in 10 CFR 61.56;

2. Label each disposal container (or transport package if potential radiation hazards preclude labeling of the individual disposal container) of waste to identify whether it is Class A waste, Class B waste, Class C waste, or greater than Class C waste, in accordance with 10 CFR 61.55;

3. Conduct a quality assurance program to ensure compliance with 10 CFR 61.55 and 61.56 (the program must include management evaluation of audits);

4. Prepare the Uniform Low-Level Radioactive Waste Manifest as required by this appendix;

5. Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that either (1) receipt of the manifest precedes the LLW shipment or (2) the

manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using both (1) and (2) is also acceptable;

6. Include Form 540 (and Form 540A, if required) with the shipment regardless of the option chosen in paragraph A.5. of this section;

7. Receive acknowledgment of the receipt of the shipment in the form of a signed copy of Form 540;

8. Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by 641—subrule 39.4(41); and

9. For any shipments or any part of a shipment for which acknowledgment of receipt has not been received within the times set forth in this appendix, conduct an investigation in accordance with paragraph E of this appendix.

B. Any waste collector licensee who handles only prepackaged waste shall:

1. Acknowledge receipt of the waste from the shipper within one week of receipt by returning a signed copy of Form 540;

2. Prepare a new manifest to reflect consolidated shipments that meet the requirements of this appendix. The waste collector shall ensure that, for each container of waste in the shipment, the manifest identifies the generator of that container of waste;

3. Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that either: (1) receipt of the manifest precedes the LLW shipment or (2) the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using both (1) and (2) is also acceptable;

4. Include Form 540 (and Form 540A, if required) with the shipment regardless of the option chosen in paragraph B.3. of this section;

5. Receive acknowledgment of the receipt of the shipment in the form of a signed copy of Form 540;

6. Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by 641—subrule 39.4(41);

7. For any shipments or any part of a shipment for which acknowledgment of receipt has not been received within the times set forth in this appendix, conduct an investigation in accordance with paragraph E of this appendix; and

8. Notify the shipper and this agency when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

C. Any licensed waste processor who treats or repackages waste shall:

1. Acknowledge receipt of the waste from the shipper within one week of receipt by returning a signed copy of Form 540;

2. Prepare a new manifest that meets the requirements of this appendix. Preparation of the new manifest reflects that the processor is responsible for meeting these requirements. For each container of waste in the shipment, the manifest shall identify the waste generators, the preprocessed waste volume, and the other information as required in paragraph E.1. of this appendix;

3. Prepare all wastes so that the waste is classified according to 10 CFR 61.55 and meets the waste characteristics requirements in 10 CFR 61.56;

4. Label each package of waste to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with 10 CFR 61.55 and 61.57;

5. Conduct a quality assurance program to ensure compliance with 10 CFR 61.55 and 61.56 (the program shall include management evaluation of audits);

6. Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that either (1) receipt of the manifest precedes the LLW shipment or (2) the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using both (1) and (2) is also acceptable;

7. Include Form 540 (and Form 540A, if required) with the shipment regardless of the option chosen in paragraph C.6. of this section;

8. Receive acknowledgment of the receipt of the shipment in the form of a signed copy of Form 540;

9. Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgment of receipt as the record of transfer of licensed material as required by 641—subrule 39.4(41);

10. For any shipment or any part of a shipment for which acknowledgment of receipt has not been received within the times set forth in this appendix, conduct an investigation in accordance with paragraph E of this appendix; and

11. Notify the shipper and this agency of any shipment, or part of a shipment, that has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

D. The land disposal facility operator shall:

1. Acknowledge receipt of the waste within one week of receipt by returning, as a minimum, a signed copy of Form 540 to the shipper. The shipper to be notified is the licensee who last possessed the waste and transferred the waste to the operator. If any discrepancy exists between materials listed on the Uniform Low-Level Radioactive Waste Manifest and materials received, copies or electronic transfer of the affected forms must be returned indicating the discrepancy;

2. Maintain copies of all completed manifests and electronically store the information required by 10 CFR 61.80(l) until the license is terminated; and

3. Notify the shipper and this agency when any shipment, or part of a shipment, has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been canceled.

E. Any shipment or part of a shipment for which acknowledgment is not received within the times set forth in this section must:

1. Be investigated by the shipper if the shipper has not received notification or receipt within 20 days after transfer; and

2. Be traced and reported. The investigation shall include tracing the shipment and filing a report with this agency. Each licensee who conducts a trace investigation shall file a written report with this agency within two weeks of completion of the investigation.

[ARC 3746C, IAB 4/11/18, effective 5/16/18]

CHAPTER 40

APPENDIX E

CLASSIFICATION AND CHARACTERISTICS OF LOW-LEVEL
RADIOACTIVE WASTE

I. Classification of Radioactive Waste for Land Disposal

a) Considerations. Determination of the classification of radioactive waste involves two considerations. First, consideration must be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration must be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and disposal methods are effective.

b) Classes of waste.

1) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste must meet the minimum requirements set forth in Section II. (a). If Class A waste also meets the stability requirements set forth in Section II. (b), it is not necessary to segregate the waste for disposal.

2) Class B waste is waste that must meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste must meet both the minimum and stability requirements set forth in Section II.

3) Class C waste is waste that not only must meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste must meet both the minimum and stability requirements set forth in Section II.

c) Classification determined by long-lived radionuclides. If the radioactive waste contains only radionuclides listed in Table I, classification shall be determined as follows:

1) If the concentration does not exceed 0.1 times the value in Table I, the waste is Class A.

2) If the concentration exceeds 0.1 times the value in Table I, but does not exceed the value in Table I, the waste is Class C.

3) If the concentration exceeds the value in Table I, the waste is not generally acceptable for land disposal.

4) For wastes containing mixtures of radionuclides listed in Table I, the total concentration shall be determined by the sum of fractions rule described in Section I.(g).

TABLE I

| Radionuclide | Concentration | |
|--------------------------|--------------------------------|-----------------------------|
| | curie/cubic meter ^a | nanocurie/gram ^b |
| C-14 | 8 | |
| C-14 in activated metal | 80 | |
| Ni-59 in activated metal | 220 | |
| Nb-94 in activated metal | 0.2 | |

| | | |
|---|------|--------|
| Tc-99 | 3 | |
| I-129 | 0.08 | |
| Alpha emitting transuranic radionuclides with half-life greater than five years | | 100 |
| Pu-241 | | 3,500 |
| Cm-242 | | 20,000 |
| Ra-226 | | 100 |

^a To convert the Ci/m³ values to gigabecquerel (GBq) per cubic meter, multiply the Ci/m³ value by 37.

^bTo convert the nCi/g values to becquerel (Bq) per gram, multiply the nCi/g value by 37.

d) Classification determined by short-lived radionuclides. If the waste does not contain any of the radionuclides listed in Table I, classification shall be determined based on the concentrations shown in Table II. However, as specified in Section I.(f), if radioactive waste does not contain any nuclides listed in either Table I or II, it is Class A.

- 1) If the concentration does not exceed the value in Column 1, the waste is Class A.
- 2) If the concentration exceeds the value in Column 1 but does not exceed the value in Column 2, the waste is Class B.
- 3) If the concentration exceeds the value in Column 2 but does not exceed the value in Column 3, the waste is Class C.
- 4) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.
- 5) For wastes containing mixtures of the radionuclides listed in Table II, the total concentration shall be determined by the sum of fractions rule described in Section I.(g).

TABLE II

| Radionuclide | Concentration, Column 1 | curie/cubic meter * | |
|--|----------------------------|---------------------|----------|
| | | Column 2 | Column 3 |
| Total of all radionuclides with less than 5-year half-life | 700 | * | * |
| H-3 | 40 | * | * |
| Co-60 | 700 | * | * |
| Ni-63 | 3.5 | 70 | 700 |
| Ni-63 in activated metal | 35 | 700 | 7000 |
| Sr-90 | 0.04 | 150 | 7000 |
| Cs-137 | 1 | 44 | 4600 |

*AGENCY NOTE: To convert the Ci/m³ value to gigabecquerel (GBq) per cubic meter, multiply the Ci/m³ value by 37. There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other radionuclides in Table II determine the waste to be Class C independent of these radionuclides.

e) Classification determined by both long- and short-lived radionuclides. If the radioactive waste contains a mixture of radionuclides, some of which are listed in Table I and some of which are listed in Table II, classification shall be determined as follows:

- 1) If the concentration of a radionuclide listed in Table I is less than 0.1 times the value listed in Table I, the class shall be that determined by the concentration of radionuclides listed in Table II.

2) If the concentration of a radionuclide listed in Table I exceeds 0.1 times the value listed in Table I, but does not exceed the value in Table I, the waste shall be Class C, provided the concentration of radionuclides listed in Table II does not exceed the value shown in Column 3 of Table II.

f) Classification of wastes with radionuclides other than those listed in Tables I and II. If the waste does not contain any radionuclides listed in either Table I or II, it is Class A.

g) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as becquerel (nanocurie) per gram.

h) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each radionuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits must all be taken from the same column of the same table. The sum of the fractions for the column must be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a concentration of 1.85 TBq/m³ (50 Ci/m³) and Cs-137 in a concentration of 814 GBq/m³ (22 Ci/m³). Since the concentrations both exceed the values in Column 1, Table II, they must be compared to Column 2 values. For Sr-90 fraction, $50/150 = 0.33$; for Cs-137 fraction, $22/44 = 0.5$; the sum of the fractions = 0.83. Since the sum is less than 1.0, the waste is Class B.

II. Radioactive Waste Characteristics

a) The following are minimum requirements for all classes of waste and are intended to facilitate handling and provide protection of health and safety of personnel at the disposal site.

1) Wastes shall be packaged in conformance with the conditions of the license issued to the site operator to which the waste will be shipped. Where the conditions of the site license are more restrictive than the provisions of this chapter, the site license conditions shall govern.

2) Wastes shall not be packaged for disposal in cardboard or fiberboard boxes.

3) Liquid waste shall be packaged in sufficient absorbent material to absorb twice the volume of the liquid.

4) Solid waste containing liquid shall contain as little freestanding and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume.

5) Waste shall not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

6) Waste shall not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with Section II.(a)(8).

7) Waste must not be pyrophoric. Pyrophoric materials contained in wastes shall be treated, prepared, and packaged to be nonflammable.⁴

8) Wastes in a gaseous form shall be packaged at an absolute pressure that does not exceed 1.5 atmospheres at 20°C. Total activity shall not exceed 100 Ci (3.7 TBq) per container.

⁴See 641—38.2 of these rules for the definition of pyrophoric.

9) Wastes containing hazardous, biological, pathogenic, or infectious material shall be treated to reduce to the maximum extent practicable the potential hazard from the nonradiological materials.

b) The following requirements are intended to provide stability of the waste. Stability is intended to ensure that the waste does not degrade and affect overall stability of the site through slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.

1) Waste shall have structural stability. A structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and compaction equipment, the presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself,

processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.

2) Notwithstanding the provisions in Section II.(a)(3) and (4), liquid wastes, or wastes containing liquid, shall be converted into a form that contains as little freestanding and noncorrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.

3) Void spaces within the waste and between the waste and its package shall be reduced to the extent practicable.

III. Labeling

Each package of waste shall be clearly labeled to identify whether it is Class A, Class B, or Class C waste, in accordance with Section I.

CHAPTER 40

APPENDIX F

QUANTITIES FOR USE WITH DECOMMISSIONING

| <u>Material</u> | <u>Microcurie*</u> |
|-----------------|--------------------|
| Americium-241 | 0.01 |
| Antimony-122 | 100 |
| Antimony-124 | 10 |
| Antimony-125 | 10 |
| Arsenic-73 | 100 |
| Arsenic-74 | 10 |
| Arsenic-76 | 10 |
| Arsenic-77 | 100 |
| Barium-131 | 10 |
| Barium-133 | 10 |
| Barium-140 | 10 |
| Bismuth-210 | 1 |
| Bromine-82 | 10 |
| Cadmium-109 | 10 |
| Cadmium-115m | 10 |
| Cadmium-115 | 100 |
| Calcium-45 | 10 |
| Calcium-47 | 10 |
| Carbon-14 | 100 |
| Cerium-141 | 100 |
| Cerium-143 | 100 |
| Cerium-144 | 1 |
| Cesium-131 | 1,000 |
| Cesium-134m | 100 |
| Cesium-134 | 1 |
| Cesium-135 | 10 |
| Cesium-136 | 10 |
| Cesium-137 | 10 |
| Chlorine-36 | 10 |
| Chlorine-38 | 10 |
| Chromium-51 | 1,000 |
| Cobalt-58m | 10 |
| Cobalt-58 | 10 |
| Cobalt-60 | 1 |
| Copper-64 | 100 |
| Dysprosium-165 | 10 |
| Dysprosium-166 | 100 |

| <u>Material</u> | <u>Microcurie*</u> |
|----------------------|--------------------|
| Erbium-169 | 100 |
| Erbium-171 | 100 |
| Europium-152 (9.2 h) | 100 |
| Europium-152 (13 yr) | 1 |
| Europium-154 | 1 |
| Europium-155 | 10 |
| Florine-18 | 1,000 |
| Gadolinium-153 | 10 |
| Gadolinium-159 | 100 |
| Gallium-72 | 10 |
| Germanium-71 | 100 |
| Gold-198 | 100 |
| Gold-199 | 100 |
| Hafnium-181 | 10 |
| Holmium-166 | 100 |
| Hydrogen-3 | 1,000 |
| Indium-113m | 100 |
| Indium-114m | 10 |
| Indium-115m | 100 |
| Indium-115 | 10 |
| Iodine-125 | 1 |
| Iodine-126 | 1 |
| Iodine-129 | 0.1 |
| Iodine-131 | 1 |
| Iodine-132 | 10 |
| Iodine-133 | 1 |
| Iodine-134 | 10 |
| Iodine-135 | 10 |
| Iridium-192 | 10 |
| Iridium-194 | 100 |
| Iron-55 | 100 |
| Iron-59 | 10 |
| Krypton-85 | 100 |
| Krypton-87 | 10 |
| Lanthanum-140 | 10 |
| Lutetium-177 | 100 |
| Manganese-52 | 10 |
| Manganese-54 | 10 |
| Manganese-56 | 10 |
| Mercury-197m | 100 |
| Mercury-197 | 100 |

| <u>Material</u> | <u>Microcurie*</u> |
|------------------|--------------------|
| Mercury-203 | 10 |
| Molybdenum-99 | 100 |
| Neodymium-147 | 100 |
| Neodymium-149 | 100 |
| Nickel-59 | 100 |
| Nickel-63 | 10 |
| Nickel-65 | 100 |
| Niobium-93m | 10 |
| Niobium-95 | 10 |
| Niobium-97 | 10 |
| Osmium-185 | 10 |
| Osmium-191m | 100 |
| Osmium-191 | 100 |
| Osmium-193 | 100 |
| Palladium-103 | 100 |
| Palladium-109 | 100 |
| Phosphorus-32 | 10 |
| Platinum-191 | 100 |
| Platinum-193m | 100 |
| Platinum-193 | 100 |
| Platinum-197m | 100 |
| Platinum-197 | 100 |
| Plutonium-239 | 0.01 |
| Polonium-210 | 0.1 |
| Potassium-42 | 10 |
| Praseodymium-142 | 100 |
| Praseodymium-143 | 100 |
| Promethium-147 | 10 |
| Promethium-149 | 10 |
| Radium-226 | 0.01 |
| Rhenium-186 | 100 |
| Rhenium-188 | 100 |
| Rhodium-103m | 100 |
| Rhodium-105 | 100 |
| Rubidium-86 | 10 |
| Rubidium-87 | 10 |
| Ruthenium-97 | 100 |
| Ruthenium-103 | 10 |
| Ruthenium-105 | 10 |
| Ruthenium-106 | 1 |
| Samarium-151 | 10 |

| <u>Material</u> | <u>Microcurie*</u> |
|---------------------|--------------------|
| Samarium-153 | 100 |
| Scandium-46 | 10 |
| Scandium-47 | 100 |
| Scandium-48 | 10 |
| Selenium-75 | 10 |
| Silicon-31 | 100 |
| Silver-105 | 10 |
| Silver-110m | 1 |
| Silver-111 | 100 |
| Sodium-22 | 1 |
| Sodium-24 | 10 |
| Strontium-85 | 10 |
| Strontium-89 | 1 |
| Strontium-90 | 0.1 |
| Strontium-91 | 10 |
| Strontium-92 | 10 |
| Sulfur-35 | 100 |
| Tantalum-182 | 10 |
| Technetium-96 | 10 |
| Technetium-97m | 100 |
| Technetium-97 | 100 |
| Technetium-99m | 100 |
| Technetium-99 | 10 |
| Tellurium-125m | 10 |
| Tellurium-127m | 10 |
| Tellurium-127 | 100 |
| Tellurium-129m | 10 |
| Tellurium-129 | 100 |
| Tellurium-131m | 10 |
| Tellurium-132 | 10 |
| Terbium-160 | 10 |
| Thallium-200 | 100 |
| Thallium-201 | 100 |
| Thallium-202 | 100 |
| Thallium-204 | 10 |
| Thorium (natural)** | 100 |
| Thulium-170 | 10 |
| Thulium-171 | 10 |
| Tin-113 | 10 |
| Tin-125 | 10 |
| Tungsten-181 | 10 |

| <u>Material</u> | <u>Microcurie*</u> |
|---|--------------------|
| Tungsten-185 | 10 |
| Tungsten-187 | 100 |
| Uranium (natural)** | 100 |
| Uranium-233 | 0.01 |
| Uranium-234 | 0.01 |
| Uranium-235 | 0.01 |
| Vanadium-48 | 10 |
| Xenon-131m | 1,000 |
| Xenon-133 | 100 |
| Xenon-135 | 100 |
| Ytterbium-175 | 100 |
| Yttrium-90 | 10 |
| Yttrium-91 | 10 |
| Yttrium-92 | 100 |
| Yttrium-93 | 100 |
| Zinc-65 | 10 |
| Zinc-69m | 100 |
| Zinc-69 | 1,000 |
| Zirconium-93 | 10 |
| Zirconium-95 | 10 |
| Zirconium-97 | 10 |
| Any alpha-emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition | 0.01 |
| Any radionuclide other than alpha-emitting radionuclides, not listed above or mixtures of beta emitters of unknown composition | 0.1 |

*To convert μCi to kBq , multiply the μCi value by 37.

**Based on alpha disintegration rate of U-238, U-234, and U-235.

NOTE: This Appendix is retained for use by those agreement states that need to adopt decommissioning regulations compatible with the U.S. Nuclear Regulatory Commission.

NOTE: Where there is involved a combination of isotopes in known amounts, the limit for the combination should be derived as follows: Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1"—that is, unity.

CHAPTER 40

APPENDIX G

RADIONUCLIDES OF CONCERN
Rescinded **ARC 1479C**, IAB 6/11/14, effective 7/16/14

APPENDIX H

NATIONALLY TRACKED SOURCE THRESHOLDS

The Terabecquerel (TBq) values are the regulatory standard. The curie (Ci) values specified are obtained by converting from the TBq value. The curie values are provided for practical usefulness only and are rounded after conversion.

| Radioactive Material | Category 1 (TBq) | Category 1 (Ci) | Category 2 (TBq) | Category 2 (Ci) |
|----------------------|------------------|-----------------|------------------|-----------------|
| Actinium-227 | 20 | 540 | 0.2 | 5.4 |
| Americium-241 | 60 | 1,600 | 0.6 | 16.0 |
| Americium-241/Be | 60 | 1,600 | 0.6 | 16.0 |
| Californium-252 | 20 | 540 | 0.2 | 5.4 |
| Cobalt-60 | 30 | 810 | 0.3 | 8.1 |
| Curium-244 | 50 | 1,400 | 0.5 | 14.0 |
| Cesium-137 | 100 | 2,700 | 1.0 | 27.0 |
| Gadolinium-153 | 1,000 | 27,000 | 10.0 | 270.0 |
| Iridium-192 | 80 | 2,200 | 0.8 | 22.0 |
| Plutonium-238 | 60 | 1,600 | 0.6 | 16.0 |
| Plutonium-239/Be | 60 | 1,600 | 0.6 | 16.0 |
| Polonium-210 | 60 | 1,600 | 0.6 | 16.0 |
| Promethium-147 | 40,000 | 1,100,000 | 400.0 | 11,000.0 |
| Radium-226 | 40 | 1,100 | 0.4 | 11.0 |
| Selenium-75 | 200 | 5,400 | 2.0 | 54.0 |
| Strontium-90 | 1,000 | 27,000 | 10.0 | 270.0 |
| Thorium-228 | 20 | 540 | 0.2 | 5.4 |
| Thorium-229 | 20 | 540 | 0.2 | 5.4 |
| Thulium-170 | 20,000 | 540,000 | 200.0 | 5,400.0 |
| Ytterbium-169 | 300 | 8,100 | 3.0 | 81.0 |

These rules are intended to implement Iowa Code chapter 136C.

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CHAPTER 41
SAFETY REQUIREMENTS FOR THE USE OF
RADIATION MACHINES AND CERTAIN USES
OF RADIOACTIVE MATERIALS

641—41.1(136C) X-rays in the healing arts.

41.1(1) Scope. This rule establishes requirements, for which a registrant is responsible, for use of X-ray equipment and imaging systems by or under the supervision of an individual authorized by and licensed in accordance with state statutes to engage in the healing arts or veterinary medicine.

a. The provisions of Chapter 41 are in addition to, and not in substitution for, any other applicable portions of 641—Chapters 38 to 42.

b. All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

41.1(2) Definitions. For the purpose of this chapter, the definitions of 641—Chapters 38 and 40 may also apply. The following are specific to 641—Chapter 41.

“*Accessible surface*” means the external surface of the enclosure or housing of the radiation producing machine as provided by the manufacturer.

“*Added filtration*” means any filtration which is in addition to the inherent filtration.

“*Aluminum equivalent*” means the thickness of type 1100 aluminum alloy affording the same attenuation, under specified conditions, as the material in question.

“*Attenuation block*” means a block or stack, having dimensions 20 centimeters by 20 centimeters by 3.8 centimeters, of type 1100 aluminum alloy or other materials having equivalent attenuation.

“*Automatic exposure control (AEC)*” means a device which automatically controls one or more technique factors in order to obtain at a preselected location(s) a required quantity of radiation (see also “Phototimer”). (Includes devices such as phototimers and ion chambers.)

“*Base density*” means the optical density due to the supporting base of the film alone. The base density of a film is the optical density that would result if an unexposed film were processed through the fixer, wash, and dryer, without first passing through the developer.

“*Base plus fog density*” means the optical density of a film due to its base density plus any action of the developer on the unexposed silver halide crystals. The base plus fog density can be measured by processing an unexposed film through the entire processing cycle and measuring the resultant optical density.

“*Beam monitoring system*” means a system designed to detect and measure the radiation present in the useful beam.

“*C-arm X-ray system*” means an X-ray system in which the image receptor and X-ray tube housing assembly are connected by a common mechanical support system in order to maintain a desired spatial relationship. This system is designed to allow a change in the projection of the beam through the patient without a change in the position of the patient.

“*Cassette*” means a light-tight case, usually made of thin, low X-ray absorption plastic, for holding X-ray film. One or two intensifying screens for the conversion of X-rays to visible light photons are mounted inside the cassette so that they are in close contact to the film.

“*Cephalometric device*” means a device intended for the radiographic visualization and measurement of the dimensions of the human head.

“*Certified components*” means components of X-ray systems which are subject to regulations promulgated under Public Law 90-602, the “Radiation Control for Health and Safety Act of 1968,” the Food and Drug Administration.

“*Certified system*” means any X-ray system which has one or more certified component(s).

“*Coefficient of variation*” or “*C*” means the ratio of the standard deviation to the mean value of a population of observations. It is estimated using the following equation:

$$c = \frac{s}{\bar{x}} = \frac{1}{\bar{x}} \left[\sum_{i=1}^n \frac{(x_i - \bar{x})^2}{n-1} \right]^{1/2}$$

where:

\bar{s} = Estimated standard deviation of the population.

\bar{X} = Mean value of observations in sample.

X_i = i^{th} observation in sample.

n = Number of observations in sample.

“*Computed tomography*” means the production of a tomogram by the acquisition and computer processing of X-ray transmission data.

“*Control chart*” means a chart used to record (and control) the results of quality control testing as a function of time.

“*Control limit*” means the range of variation on a control chart beyond which action must be taken to correct the results of quality control testing.

“*Control panel*” (see X-ray control panel).

“*Cooling curve*” means the graphical relationship between heat units stored and cooling time.

“*CT*” (see “Computed tomography”).

“*Dead-man switch*” means a switch so constructed that a circuit closing contact can be maintained only by continuous pressure on the switch by the operator.

“*Dedicated mammography equipment*” means X-ray systems designed specifically for breast imaging, providing optimum imaging geometry, a device for breast compression and low dose exposure that can generate reproducible images of high quality.

“*Densitometer*” means an instrument which measures the degree of blackening (or radiographic density) of film due to radiation or light by measuring the ratio of the light intensity incident on the film to the light intensity transmitted by the film.

“*Detents*” means mechanical settings that limit or prevent the motion or rotation of an X-ray tube, cassette assembly, or image receptor system.

“*Developer*” means a chemical solution (alkaline) that changes the latent image (exposed silver halide crystals) on a film to a visible image composed of minute masses of black metallic silver.

“*Developer replenishment*” means the process, occurring as film travels past a certain point in the processor, triggering the activation of a pump, whereby fresh developer is added in small amounts to the solution in the developer tank of the processor. The purpose is to maintain the proper alkalinity, chemical activity, and level of solution in the developer tank.

“*Diagnostic mammography*” means mammography performed on an individual who, by virtue of symptoms or physical findings, is considered to have a substantial likelihood of having breast disease.

“*Diagnostic source assembly*” means the tube housing assembly with a beam-limiting device attached.

“*Direct scattered radiation*” means that scattered radiation which has been deviated in direction only by materials irradiated by the useful beam (see “Scattered radiation”).

“*Entrance exposure rate*” means the exposure free in air per unit time at the point where the center of the useful beam enters the patient.

“*Equipment*” (see “X-ray equipment”).

“*Field emission equipment*” means equipment which uses an X-ray tube in which electron emission from the cathode is due solely to the action of an electric field.

“*Filter*” means material placed in the useful beam to preferentially absorb selected radiations.

“*Fixer*” means a chemical solution (acidic) which removes the unexposed and undeveloped silver halide crystals from film so it will not discolor or darken with age or exposure to light. Fixer also hardens the gelatin containing the black metallic silver so film may be dried and resist damage from abrasions.

“*Fixer retention*” means the inadequate removal of fixer from the film by the water in the wash tank of the processor. Retained fixer causes eventual brown discoloration of the radiograph.

“*Fluoroscopic imaging assembly*” means a subsystem in which X-ray photons produce a visual image. It includes the image receptor(s) such as the image intensifier and spot-film device, electrical

interlocks, if any, and structural material providing linkage between the image receptor and diagnostic source assembly.

“Focal spot (actual)” means the area projected on the anode of the X-ray tube bombarded by the electrons accelerated from the cathode and from which the useful beam originates.

“Focal spot size” means the area of the target or anode that is bombarded by electrons from the cathode of the X-ray tube to produce X-rays. The smaller the focal spot, the better the limited spatial resolution of the X-ray system, especially in magnification mammography.

“Fog” means the density added to a radiograph due to unwanted action of the developer on the unexposed silver halide crystals or by light, radiation, chemical, or heat exposure during storage, handling, and processing.

“General purpose radiographic X-ray system” means any radiographic X-ray system which, by design, is not limited to radiographic examination of specific anatomical regions.

“Gonad shield” means a protective barrier for the testes or ovaries.

“Healing arts screening” means the use of radiation on human beings for the detection or evaluation of health indicators for which the individual is considered at high risk when such tests are not specifically and individually ordered by:

1. An individual authorized under 41.1(3)“a”(7), or
2. An individual licensed as a physician in Iowa and listed as an authorized user on an NRC or agreement state radioactive materials license.

“Heat unit” means a unit of energy equal to the product of the peak kilovoltage, milliamperes, and seconds, i.e., $kVp \times mA \times \text{second}$.

“Image contrast” means the amount of radiographic density difference between adjacent areas resulting from a fixed amount of attenuation difference or light exposure difference.

“Image intensifier” means a device, installed in its housing, which instantaneously converts an X-ray pattern into a corresponding light image of higher energy intensity.

“Image noise” See “Radiographic noise.”

“Image quality” means the overall clarity and detail of a radiographic image. Limiting spatial resolution (or resolving power), image sharpness, and image contrast are three common measures of image quality.

“Image receptor” means any device, such as a fluorescent screen or radiographic film, which transforms incident X-ray photons either into a visible image or into another form which can be made into a visible image by further transformations.

“Image sharpness” means the overall impression of detail and clarity in a radiographic image.

“Inherent filtration” means the filtration of the useful beam provided by the permanently installed components of the tube housing assembly.

“Kilovolts peak” (see “Peak tube potential”).

“kVp” (see “Peak tube potential”).

“kWs” means kilowatt second.

“Leakage technique factors” means the technique factors associated with the diagnostic or therapeutic source assembly which are used in measuring leakage radiation. They are defined as follows:

a. For diagnostic source assemblies intended for capacitor energy storage equipment, the maximum-rated peak tube potential and the maximum-rated number of exposures in an hour for operation at the maximum-rated peak tube potential with the quantity of charge per exposure being 10 millicoulombs, i.e., 10 milliamperere seconds, or the minimum obtainable from the unit, whichever is larger.

b. For diagnostic source assemblies intended for field emission equipment rated for pulsed operation, the maximum-rated peak tube potential and the maximum-rated number of X-ray pulses in an hour for operation at the maximum-rated peak tube potential.

c. For all other diagnostic or therapeutic source assemblies, the maximum-rated peak tube potential and the maximum-rated continuous tube current for the maximum-rated peak tube potential.

“*Linear attenuation coefficient*” or “ μ ” means the quotient of dN/N divided by dl when dN/N is the fraction of uncharged ionizing radiation that experience interactions in traversing a distance dl in a specified material.

“*Line-voltage regulation*” means the difference between the no-load and the load line potentials expressed as a percent of the load line potential. It is calculated using the following equation:

$$\text{Percent line-voltage regulation} = 100 (V_n - V_l) / V_l$$

where

V_n = No-load line potential and

V_l = Load line potential.

“*mAs*” means milliamperere second.

“*Maximum line current*” means the root-mean-square current in the supply line of an X-ray machine operating at its maximum rating.

“*Mobile X-ray equipment*” (see “X-ray equipment”).

“*PBL*” (see “Positive beam limitation”).

“*Phototimer*” means a method for controlling radiation exposures to image receptors by the amount of radiation which reaches a radiation-monitoring device(s). The radiation-monitoring device(s) is part of an electronic circuit which controls the duration of time the tube is activated (see “Automatic exposure control”).

“*PID*” (see “Position indicating device”).

“*Portable X-ray equipment*” (see “X-ray equipment”).

“*Position indicating device*” means a device on dental X-ray equipment used to indicate the beam position and to establish a definite source-surface (skin) distance. It may or may not incorporate or serve as a beam-limiting device.

“*Positive beam limitation*” means the automatic or semiautomatic adjustment of an X-ray beam to the size of the selected image receptor, whereby exposures cannot be made without such adjustment.

“*Processor*” means an automated device which transports film in a controlled manner by a system of rollers through specialized sections where developing, fixing, washing, and drying of the film occur.

“*Protective apron*” means an apron made of radiation-absorbing materials used to reduce radiation exposure.

“*Protective glove*” means a glove made of radiation-absorbing materials used to reduce radiation exposure.

“*Quality assurance*” means the overall program of testing and maintaining the highest possible standards of quality in the acquisition and interpretation of radiographic images.

“*Quality control*” means the actual process of testing and maintaining the highest possible standards of quality in equipment performance and the acquisition and interpretation of radiographic images.

“*Radiation therapy simulation system*” means a radiographic or fluoroscopic X-ray system intended for localizing the volume to be exposed during radiation therapy and confirming the position and size of the therapeutic irradiation field.

“*Radiograph*” means an image receptor on which the image is created directly or indirectly by an X-ray pattern and results in a permanent record.

“*Radiographic contrast*” means the magnitude of optical density difference between structures of interest and their surroundings, or between areas of film receiving different amount of X-ray or visible light exposure.

“*Radiographic noise*” means unwanted fluctuations in optical density on the screen-film image.

“*Rating*” means the operating limits as specified by the component manufacturer.

“*Recording*” means producing a permanent form of an image resulting from X-ray photons.

“*Repeat (or reject) analysis*” means a systematic approach to determine the causes for radiographs being discarded or repeated, or both.

“*Replenishment rate*” means the amount of chemicals added in order to maintain the proper chemical activity of developer and fixer solutions.

“*Response time*” means the time required for an instrument system to reach 90 percent of its final reading when the radiation-sensitive volume of the instrument system is exposed to a step change in radiation flux from zero sufficient to provide a steady state midscale reading.

“*Safelight*” means a source of minimal visible light in a darkroom, produced at frequencies (colors) to which the film is insensitive, protecting the film from unwanted exposure (fog) while allowing personnel to function more efficiently and safely.

“*Screen*” means microscopic phosphor crystals on a plastic support used in conjunction with either single or double emulsion film; the screen emits visible light when exposed to X-radiation, creating a latent image on X-ray film.

“*Screen-film combination*” means a particular intensifying screen used with a particular type of film. Care must be taken to match the number of screens (one or two) to the number of emulsions coating the film and to match the light output spectrum of the screen to the light sensitivity of the film.

“*Screen-film contact*” means the close proximity of the intensifying screen to the emulsion of the film, necessary in order to achieve a sharp image on the film.

“*Sensitometer*” means a device used to reproducibly expose a piece of film to a number of different levels of light intensity.

“*Sensitometric strip*” means a sheet of film exposed by a sensitometer, resulting in a gray scale range. Such strips are used to measure the range of densities, from minimum to maximum, resulting from a reproducible set of exposures.

“*Sensitometry*” means a quantitative measurement of the response of film to exposure and development. Sensitometry is used to test the processor setup and stability.

“*SID*” (see “*Source-image receptor distance*”).

“*Source*” means the focal spot of the X-ray tube.

“*Source-image receptor distance*” means the distance from the source to the center of the input surface of the image receptor.

“*Spot check*” means a procedure which is performed to ensure that a previous calibration continues to be valid.

“*Spot film*” means a radiograph which is made during a fluoroscopic examination to permanently record conditions which exist during that fluoroscopic procedure.

“*Spot-film device*” means a device intended to transport or position a radiographic image receptor between the X-ray source and fluoroscopic image receptor. It includes a device intended to hold a cassette over the input end of an image intensifier for the purpose of making a radiograph.

“*Stationary X-ray equipment*” (see “*X-ray equipment*”).

“*Technique factors*” means the following conditions of operation:

a. For capacitor energy storage equipment, peak tube potential in kV and quantity of charge in mAs;
b. For field emission equipment rated for pulsed operation, peak tube potential in kV, and number of X-ray pulses;

c. For CT X-ray systems designed for pulsed operation, peak tube potential in kV, scan time in seconds, and either tube current in mA, X-ray pulse width in seconds, and the number of X-ray pulses per scan, or the product of tube current, X-ray pulse width, and the number of X-ray pulses in mAs;

d. For CT X-ray systems not designed for pulsed operation, peak tube potential in kV, and either tube current in mA and scan time in seconds, or the product of tube current and exposure time in mAs and the scan time when the scan time and exposure time are equivalent; and

e. For all other equipment, peak tube potential in kV, and either tube current in mA and exposure time in seconds, or the product of tube current and exposure time in mAs.

“*Tomogram*” means the depiction of the X-ray attenuation properties of a section through the body.

“*Tube rating chart*” means the set of curves which specify the rated limits of operation of the tube in terms of the technique factors.

“*Useful beam*” means the radiation emanating from the tube housing port or the radiation head and passing through the aperture of the beam-limiting device when the exposure controls are in a mode to cause the system to produce radiation.

“*Variable-aperture beam-limiting device*” means a beam-limiting device which has capacity for stepless adjustment of the X-ray field size at a given SID.

“*Viewbox*” means a device by which a uniform field of white light is transmitted through an X-ray so that the image on the film may be seen.

“*Visible area*” means that portion of the input surface of the image receptor over which incident X-ray photons are producing a visible image.

“*X-ray control panel*” means a device which controls input power to the X-ray high-voltage generator and the X-ray tube. It includes equipment such as timers, phototimers, automatic brightness stabilizers, and similar devices, which control the technique factors of an X-ray exposure.

“*X-ray equipment*” means an X-ray system, subsystem, or component thereof. Types of X-ray equipment are as follows:

a. “*Mobile X-ray equipment*” means X-ray equipment mounted on a permanent base with wheels or casters for moving while completely assembled.

b. “*Portable X-ray equipment*” means X-ray equipment designed to be hand-carried but used with a tripod or other stabilization mechanism so the operator is not holding the equipment during exposure.

c. “*Stationary X-ray equipment*” means X-ray equipment which is installed in a fixed location.

d. “*Handheld X-ray equipment*” means X-ray equipment designed by the manufacturer to be handheld by the operator during the exposure. X-ray equipment designed without a backscatter shield is prohibited.

“*X-ray exposure control*” means a device, switch, button or similar means by which an operator initiates or terminates the radiation exposure. The X-ray exposure control may include such associated equipment as timers and backup timers.

“*X-ray field*” means that area of the intersection of the useful beam and any one of the set of planes parallel to and including the plane of the image receptor, whose perimeter is the locus of points at which the exposure rate is one-fourth of the maximum in the intersection.

“*X-ray high-voltage generator*” means a device which transforms electrical energy from the potential supplied by the X-ray control to the tube operating potential. The device may also include means for transforming alternating current to direct current, filament transformers for the X-ray tube(s), high-voltage switches, electrical protective devices, and other appropriate elements.

“*X-ray system*” means an assemblage of components for the controlled production of X-rays. It includes minimally an X-ray high-voltage generator, an X-ray control, a tube housing assembly, a beam-limiting device, and the necessary supporting structures. Additional components which function with the system are considered integral parts of the system.

“*X-ray table*” means a patient support device with its patient support structure (tabletop) interposed between the patient and the image receptor during radiography or fluoroscopy. This includes, but is not limited to, any stretcher equipped with a radiolucent panel and any table equipped with a cassette tray (or bucky), cassette tunnel, image intensifier, or spot-film device beneath the tabletop.

41.1(3) Administrative controls.

a. Registrant. The registrant shall be responsible for maintaining and directing the operation of the X-ray system(s) under the registrant’s administrative control, for ensuring that the requirements of these rules are met in the operation of the X-ray system(s), and for having the following minimum tests performed by a registered service facility according to the following schedule:

1. Medical/chiropractic: timer accuracy, exposure reproducibility, kVp accuracy as set forth in 41.1(6), and light field/X-ray field alignment as set forth in 41.1(6) every two years.

2. Dental/podiatry: timer accuracy, exposure reproducibility and kVp accuracy as set forth in 41.1(7) every four years.

3. Fluoroscopic: entrance exposure rate (41.1(5) “c”), and minimum SSD (41.1(5) “f”) annually.

4. Veterinary systems are exempt from the above testing requirements.

All service and installation shall be performed by persons registered under 641—subrule 39.3(3). The registrant or the registrant’s agent shall ensure that the requirements of these rules are met in the operation of the X-ray system(s).

(1) An X-ray system which does not meet the provisions of these rules shall not be operated for diagnostic or therapeutic purposes unless so directed by the agency. All position locking, holding, and centering devices on X-ray system components and systems shall function as intended. All X-ray systems shall be maintained in good mechanical repair and comply with all state and local electrical code requirements.

(2) Individuals who will be operating the X-ray systems shall be adequately instructed in safe operating procedures and be competent in the safe use of the equipment. In addition:

1. Operators in medical facilities shall meet the requirements of 641—Chapter 42, as applicable, and shall make the permit available at the individual's place of employment. If the permit holder works at more than one facility, a duplicate of the permit shall be kept at each facility.

(3) A chart shall be provided in the vicinity of the diagnostic X-ray system's control panel which specifies, for all examinations performed with that system, the following information:

1. Patient's body part and anatomical size, or body part thickness, or age (for pediatrics), versus technique factors to be utilized unless automatically set by the X-ray system;

2. Type and size of the film or film-screen combination to be used;

3. Type and focal distance of the grid to be used, if any;

4. Source to image receptor distance to be used, except for dental intraoral radiography; and

5. Type and location of placement of human patient shielding to be used (e.g., gonad).

(4) Written safety procedures shall be provided to each individual operating X-ray equipment, including patient holding and any restrictions of the operating technique required for the safe operation of the particular X-ray system. The operator shall be able to demonstrate familiarity with these procedures.

(5) Except for patients who cannot be moved out of the room, only the staff and ancillary personnel required for the medical procedure or training shall be in the room during the radiographic exposure. Other than the patient being examined:

1. All individuals shall be positioned such that no part of the body will be struck by the useful beam unless protected by 0.5 millimeter lead equivalent.

2. The X-ray operator, other staff, ancillary personnel, and other persons required for the medical procedure shall be protected from the scattered primary radiation by protective aprons or whole body protective barriers of not less than 0.25 millimeter lead equivalent.

3. Human patients who cannot be removed from the room shall be protected from the direct scatter radiation by whole body protective barriers of 0.25 millimeter lead equivalent or shall be so positioned that the nearest portion of the body is at least 2 meters from both the tube head and the nearest edge of the image receptor.

(6) Gonad shielding of not less than 0.50 millimeter lead equivalent shall be used for human patients, who have not passed the reproductive age, during radiographic procedures in which the gonads are in the useful beam, except for cases in which this would interfere with the diagnostic procedure.

(7) Individuals shall not be exposed to the useful beam unless (1) the radiation exposure occurs in the context of a previously established professional relationship between a licensed practitioner of the healing arts or a licensed registered nurse who is registered as an advanced registered nurse practitioner pursuant to Iowa Code chapter 152 and a patient, which includes a physical examination by the practitioner of the patient unless such examination is not clinically indicated; and (2) such practitioner issues a written order for the radiation exposure. The written order shall be issued prior to the exposure unless the exposure results from care provided in an emergency or surgery setting. A verbal order may be issued provided the licensed practitioner is supervising the procedure and the order is documented in the patient's record after the procedure is completed. This provision specifically prohibits deliberate exposure for the following purposes:

1. Exposure of an individual for training, demonstration, or other non-healing arts purposes; and

2. Exposure of an individual for the purpose of healing arts screening except as authorized by 41.1(3) "a"(11).

(8) When a patient or film must be provided with auxiliary support during a radiation exposure:

1. Mechanical holding devices shall be used when the technique permits. The written safety procedures, required by 41.1(3)“a”(4), shall list individual projections where holding devices cannot be utilized;

2. Written safety procedures, as required by 41.1(3)“a”(4), shall indicate the requirements for selecting a holder and the procedure the holder shall follow;

3. The human holder shall be instructed in personal radiation safety and protected as required by 41.1(3)“a”(5)“2”;

4. No individual shall be used routinely to hold film or patients; and

5. In those cases where the human patient must hold the film, except during intraoral examinations, any portion of the body other than the area of clinical interest struck by the useful beam shall be protected by not less than 0.5 millimeter lead equivalent material.

6. Each facility shall have leaded aprons and gloves available in sufficient numbers to provide protection to all personnel who are involved with X-ray operations and who are otherwise not shielded.

(9) Procedures and auxiliary equipment designed to minimize patient and personnel exposure commensurate with the needed diagnostic information shall be utilized.

1. The speed of film or screen and film combinations shall be the fastest speed consistent with the diagnostic objective of the examinations. Film cassettes without intensifying screens shall not be used for any routine diagnostic radiological imaging, with the exception of veterinary radiography and standard film packets for intraoral use in dental radiography.

2. The radiation exposure to the patient shall be the minimum exposure required to produce images of good diagnostic quality.

3. Portable or mobile X-ray equipment shall be used only for examinations, excluding intraoral dental imaging, where it is impractical to transfer the patient(s) to a stationary X-ray installation. Handheld mobile X-ray equipment may be used for routine intraoral dental imaging in place of stationary equipment. Handheld X-ray equipment shall be used only for intraoral dental radiography.

4. X-ray systems subject to 41.1(6) shall not be utilized in procedures where the source to human patient distance is less than 30 centimeters.

5. If grids are used between the patient and the image receptor to decrease scatter to the film and improve contrast, the grid shall:

- Be positioned properly, i.e., tube side facing the correct direction, and the grid centered to the central ray;

- If the grid is of the focused type, be at the proper focal distance for the SIDs being used.

(10) All individuals who are associated with the operation of an X-ray system are subject to the requirements of 641—subrule 40.36(4) and rules 641—40.15(136C) and 641—40.37(136C). In addition:

1. When protective clothing or devices are worn on portions of the body and a personnel monitoring device(s) is present, it (they) shall be worn in accordance with the recommendations found in Chapter 4 of the National Council of Radiation Protection and Measurements Report No. 57.

2. Exposure of a personnel monitoring device to deceptively indicate a dose delivered to an individual is prohibited.

(11) Healing arts screening. Any person proposing to conduct a healing arts screening program shall not initiate such a program in the state of Iowa without prior written approval of the agency. When requesting such approval, that person shall submit the information outlined in Appendix C of this chapter. The agency shall not approve a healing arts screening program unless the applicant submits data supporting the efficacy of the screening test in diagnosing the disease or condition being screened. If any information submitted to the agency becomes invalid or outdated, the applicant shall notify the agency in writing within five calendar days.

(12) Rescinded IAB 3/31/04, effective 5/5/04.

b. Information and maintenance record and associated information. Records in 41.1(3)“b”(1) and (3) below shall be maintained until the X-ray system is removed from the facility. There shall be two cycles of records on file for items in 41.1(3)“b”(2) below. The registrant shall maintain the following information for each X-ray system for inspection by the agency:

(1) User’s manual for the X-ray system;

(2) Records of surveys, calibrations, maintenance, and modifications performed on the X-ray system(s) with the names of persons who performed such services;

(3) A copy of all correspondence with this agency regarding that X-ray system.

c. X-ray utilization log. Except for veterinary facilities, each facility shall maintain an X-ray log containing the patient's name, the type of examinations, the dates the examinations were performed, the name of the individual performing the X-ray procedure, and the number of exposures and retakes involved. When the patient or film must be provided with human auxiliary support, the name of the human holder shall be recorded. These records shall be kept until the facility is inspected by this agency or until all films listed on the utilization log have been purged.

d. Plan review.

(1) Prior to construction of all new installations, or modifications of existing installations, or installation of equipment into existing facilities utilizing X-rays for diagnostic or therapeutic purposes, the floor plans and equipment arrangements shall be submitted to the agency for review and verification that national standards have been met. The required information is denoted in Appendices A and B of this chapter.

(2) The agency may require the applicant to utilize the services of a qualified expert to determine the shielding requirements prior to the plan review and approval.

(3) The approval of such plans shall not preclude the requirement of additional modifications should a subsequent analysis of operating conditions indicate the possibility of an individual receiving a dose in excess of the limits prescribed in 641—Chapter 40.

e. Federal performance standards. All X-ray equipment shall comply with the applicable performance standards of 21 CFR 1020.30 to 1020.40 which were in effect at the time the unit was manufactured. All equipment manufactured before the effective date of 21 CFR 1020.30 to 1020.40 shall meet the requirements of the Iowa rules. Persons registered to possess the affected radiation-emitting equipment in Iowa shall be responsible for maintaining the equipment in compliance with the appropriate federal performance standards.

f. X-ray film processing facilities and practices (except for mammography). Each installation using a radiographic X-ray system and using analog image receptors (e.g., radiographic film) shall have available suitable equipment for handling and processing radiographic film in accordance with the following provisions:

(1) Manually developed film.

1. Processing tanks shall be constructed of mechanically rigid, corrosion-resistant material; and

2. Film shall be processed in accordance with the time-temperature relationships recommended by the film developer manufacturer. The specified developer temperature and immersion time shall be posted in the darkroom. Deviations from the manufacturer's recommendations shall be in writing and on file at the facility. Documentation shall include justification for the deviation.

3. Devices shall be utilized which will indicate the actual temperature of the developer and signal the passage of a preset time appropriate to the developing time required.

(2) Automatic processors and other closed processing systems.

1. Film shall be processed in accordance with the time-temperature relationships recommended by the film developer manufacturer.

2. Processing deviations from the requirements of 41.1(3)“f” shall be documented by the registrant in such manner that the requirements are shown to be met or exceeded (e.g., extended processing and special rapid chemistry).

3. All processing equipment shall be in good mechanical working order.

(3) Other requirements.

1. Pass boxes, if provided, shall be so constructed as to exclude light from the darkroom when cassettes are placed in or removed from the boxes, and shall incorporate adequate shielding from stray radiation to prevent exposure of undeveloped film.

2. The darkroom shall be light tight and use proper safelighting such that any film type in use exposed in a cassette to X-radiation sufficient to produce an optical density from 1 to 2 when processed shall not suffer an increase in density greater than 0.1 when exposed out of the cassette in the darkroom

for 2 minutes with all safelights on. If used, daylight film handling boxes shall preclude fogging of the film.

3. Darkrooms typically used by more than one individual shall be provided a method to prevent accidental entry while undeveloped films are being handled or processed.

4. Film shall be stored in a cool, dry place and shall be protected from exposure to stray radiation. Film in open packages shall be stored in a light tight container.

5. Film cassettes and intensifying screens shall be inspected periodically and shall be cleaned and replaced as necessary to best ensure radiographs of good diagnostic quality.

6. Outdated X-ray film shall not be used for diagnostic radiographs, unless the film has been stored in accordance with the manufacturer's recommendations and a sample of the film passes a sensitometric test for normal ranges of base plus fog and speed.

7. Film developing solutions shall be prepared in accordance with the directions given by the manufacturer and shall be maintained in strength by replenishment or renewal so that full development is accomplished within the time specified by the manufacturer.

(4) Records shall be maintained to verify that the items in 41.1(3) "f" are performed according to the requirements. Records may be discarded only after an agency inspection has been completed and the facility determined to be in compliance.

g. Retention of films. Record retention of films shall be seven years for patients 18 years of age or older and seven years plus the difference between the patient's age and 18 for minors.

(1) If the facility is currently utilizing hard-copy film to store images, it may continue to use this method throughout the retention period.

(2) If the facility is currently utilizing computer media and also storing images in a hard-copy format, it may continue to use this method of retention throughout the retention period. If the images are also on computer media, the data should be backed up, or refreshed, at appropriate intervals as defined by the facility.

(3) If the facility is solely utilizing computer media to store study information for which a report is generated, the recording media is to be stored in conditions that will ensure that deterioration will not occur for the period required by this policy. The facility must maintain either retrieval or access or both to the stored images.

(4) If a patient's medical images are identified as being involved in a legal case, the records should immediately be coded appropriately, and maintained for the required time frame defined in this paragraph. At the time the records have reached the end of the appropriate time frame for retention, the previously identified responsible individuals involved in the legal action should be contacted for further instruction.

(5) If records are temporarily transferred to any party, appropriate information relating to location, date of release, and individual having custody of the records should be maintained.

(6) A facility that is ceasing operations must either transfer its film records to another facility or provide the film records to its patients. A certified letter as to the location, or disposition, of the film records must be sent to notify the patients of the transferal.

41.1(4) General requirements for all diagnostic X-ray systems. In addition to other requirements of this chapter, all diagnostic X-ray systems shall meet the following requirements:

a. Warning label. The control panel containing the main power switch shall bear the warning statement, legible and accessible to view: "WARNING: This X-ray unit may be dangerous to patient and operator unless safe exposure factors and operating instructions are observed."

b. Battery charge indicator. On battery-powered X-ray generators, visual means shall be provided on the control panel to indicate whether the battery is in a state of charge adequate for proper operation.

c. Leakage radiation from the diagnostic source assembly. The leakage radiation from the diagnostic source assembly measured at a distance of 1 meter in any direction from the source shall not exceed 100 milliroentgens (25.8 $\mu\text{C}/\text{kg}$) in one hour when the X-ray tube is operated at its leakage technique factors. Compliance shall be determined by measurements averaged over an area of 100 square centimeters with no linear dimension greater than 20 centimeters.

d. Radiation from components other than the diagnostic source assembly. The radiation emitted by a component other than the diagnostic source assembly shall not exceed 2 milliroentgens (0.516 $\mu\text{C}/\text{kg}$) in one hour at 5 centimeters from any accessible surface of the component when it is operated in an assembled X-ray system under any conditions for which it was designed. Compliance shall be determined by measurements averaged over an area of 100 square centimeters with no linear dimension greater than 20 centimeters.

e. Beam quality.

(1) Half-value layer.

1. The half-value layer of the useful beam for a given X-ray tube potential shall not be less than the values shown in Table I. If it is necessary to determine such half-value layer at an X-ray tube potential which is not listed in Table I, linear interpolation or extrapolation may be made.

Table I

| Design operating range (kVp) | Measured potential (kVp) | Half-value layer (mm of aluminum) |
|------------------------------|--------------------------|-----------------------------------|
| Below 50 | 30 | 0.3 |
| | 40 | 0.4 |
| | 49 | 0.5 |
| 50 to 70 | 50 | 1.2 |
| | 60 | 1.3 |
| | 70 | 1.5 |
| Above 70 | 71 | 2.1 |
| | 80 | 2.3 |
| | 90 | 2.5 |
| | 100 | 2.7 |
| | 110 | 3.0 |
| | 120 | 3.2 |
| | 130 | 3.5 |
| | 140 | 3.8 |
| | 150 | 4.1 |

2. and 3. Rescinded IAB 4/8/98, effective 7/1/98.

4. For capacitor energy storage equipment, compliance with the requirements of 41.1(4)“e” shall be determined with the system fully charged and a setting of 10 mAs for each exposure.

5. The required minimal half-value layer of the useful beam shall include the filtration contributed by all materials which are permanently between the source and the patient.

(2) Filtration controls. For X-ray systems which have variable kVp and variable filtration for the useful beam, a device shall link the kVp selector with the filter(s) and shall prevent an exposure unless the minimum amount of filtration required by 41.1(4)“e”(1)“1” is in the useful beam for the given kVp which has been selected.

f. Multiple tubes. Where two or more radiographic tubes are controlled by one exposure switch, the tube or tubes which have been selected shall be clearly indicated prior to initiation of the exposure. This indication shall be both on the X-ray control panel and at or near the tube housing assembly which has been selected.

g. Mechanical support of tube head. The tube housing assembly supports shall be adjusted such that the tube housing assembly will remain stable during an exposure unless tube housing movement is a designed function of the X-ray system.

h. Technique indicators.

(1) The technique factors to be used during an exposure shall be indicated before the exposure begins. If automatic exposure controls are used, the technique factors which are set prior to the exposure shall be indicated.

(2) The requirement of 41.1(4)“h”(1) may be met by permanent markings on equipment having fixed technique factors. Indication of technique factors shall be visible from the operator’s position except in the case of spot films made by the fluoroscopist.

(3) The technique indicators shall be accurate to within manufacturer’s standards.

i. Rescinded IAB 3/30/05, effective 5/4/05.

41.1(5) Fluoroscopic X-ray systems except for computed tomography X-ray systems. All fluoroscopic X-ray systems shall be image intensified and meet the following requirements:

a. Limitation of useful beam.

(1) Primary barrier.

1. The fluoroscopic imaging assembly shall be provided with a primary protective barrier which intercepts the entire cross section of the useful beam at any SID.

2. The X-ray tube used for fluoroscopy shall not produce X-rays unless the barrier is in position to intercept the entire useful beam.

(2) Fluoroscopic beam limitation.

1. For certified fluoroscopic systems with or without a spot film device, neither the length nor the width of the X-ray field in the plane of the image receptor shall exceed that of the visible area of the image receptor by more than 3 percent of the SID. The sum of the excess length and the excess width shall be no greater than 4 percent of the SID.

2. For uncertified fluoroscopic systems with a spot film device, the X-ray beam with the shutter fully opened (during fluoroscopy or spot filming) shall be no larger than the largest spot film size for which the device is designed. Measurements shall be made at the maximum SID available but at no less than 20 centimeters from the tabletop to the film plane distance.

3. For uncertified fluoroscopic systems without a spot film device, the requirements of 41.1(5)“a”(2)“1” apply.

4. Other requirements for fluoroscopic beam limitation:

- Means shall be provided to permit further limitation of the field. Beam-limiting devices manufactured after May 22, 1979, and incorporated in equipment with a variable SID or a visible area of greater than 300 square centimeters shall be provided with means for stepless adjustment of the X-ray field;

- All equipment with a fixed SID and a visible area of 300 square centimeters or less shall be provided either with stepless adjustment of the X-ray field or with means to further limit the X-ray field size at the plane of the image receptor to 125 square centimeters or less;

- If provided, stepless adjustment shall, at the greatest SID, provide continuous field sizes from the maximum attainable to a field size of 5 centimeters by 5 centimeters or less;

- For equipment manufactured after February 25, 1978, when the angle between the image receptor and beam axis is variable, means shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor;

- For noncircular X-ray fields used with circular image receptors, the error in alignment shall be determined along the length and width dimensions of the X-ray field which pass through the center of the visible area of the image receptor.

(3) Spot-film beam limitation. Spot-film devices shall meet the following requirements:

1. Means shall be provided between the source and the patient for adjustment of the X-ray field size in the plane of the film to the size of that portion of the film which has been selected on the spot-film selector. Such adjustment shall be automatically accomplished except when the X-ray field size in the plane of the film is smaller than that of the selected portion of the film. For spot-film devices

manufactured after June 21, 1979, if the X-ray field size is less than the size of the selected portion of the film, the means for adjustment of the field size shall be only at the operator's option;

2. Neither the length nor the width of the X-ray field in the plane of the image receptor shall differ from the corresponding dimensions of the selected portion of the image receptor by more than 3 percent of the SID when adjusted for full coverage of the selected portion of the image receptor. The sum, without regard to sign, of the length and width differences shall not exceed 4 percent of the SID;

3. It shall be possible to adjust the X-ray field size in the plane of the film to a size smaller than the selected portion of the film. The minimum field size at the greatest SID shall be equal to, or less than, 5 centimeters by 5 centimeters;

4. The center of the X-ray field in the plane of the film shall be aligned with the center of the selected portion of the film to within 2 percent of the SID; and

5. On spot-film devices manufactured after February 25, 1978, if the angle between the plane of the image receptor and beam axis is variable, means shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor, and compliance shall be determined with the beam axis indicated to be perpendicular to the plane of the image receptor.

(4) Override. If a means exists to override any of the automatic X-ray field size adjustments required in 41.1(5) "a"(2) and 41.1(5) "a"(3), that means:

1. Shall be designed for use only in the event of system failure;
2. Shall incorporate a signal visible at the fluoroscopist's position which will indicate whenever the automatic field size adjustment is overridden; and
3. Shall have a clear and durable label as follows:

FOR X-RAY FIELD LIMITATION SYSTEM FAILURE

b. Activation of the fluoroscopic tube. X-ray production in the fluoroscopic mode shall be controlled by a device which requires continuous pressure by the fluoroscopist for the entire time of any exposure. When recording serial fluoroscopic images, the fluoroscopist shall be able to terminate the X-ray exposure(s) at any time, but means may be provided to permit completion of any single exposure of the series in process.

c. Exposure rate limits.

(1) Entrance exposure rate allowable limits.

1. Fluoroscopic equipment which is provided with automatic exposure rate control shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 2.6 mC/kg (10 roentgens) per minute at the point where the center of the useful beam enters the patient, except

- During recording of fluoroscopic images; or
- When an optional high level control is provided. When so provided, the equipment shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens (1.3 mC/kg) per minute at the point where the center of the useful beam enters the patient unless the high level control is activated. Special means of activation of high level controls shall be required. The high level control shall only be operable when continuous manual activation is provided by the operator. A continuous signal audible to the fluoroscopist shall indicate that the high level control is being employed.

2. Fluoroscopic equipment which is not provided with automatic exposure rate control shall not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens (1.3 mC/kg) per minute at the point where the center of the useful beam enters the patient, except:

- During recording of fluoroscopic images; or
- When the mode or modes have an optional high level control, in which case the mode or modes shall not be operable at any combination of tube potential and current which shall result in an exposure rate in excess of 5 roentgens (1.3 mC/kg) per minute at the point where the center of the useful beam enters the patient, unless the high level control is activated. Special means of activation of high level controls

shall be required. The high level control shall only be operable when continuous manual activation is provided by the operator. A continuous signal audible to the fluoroscopist shall indicate that the high level control is being employed.

3. Compliance with the requirements of 41.1(5)“c” shall be determined as follows:

- If the source is below the table, exposure rate shall be measured 1 centimeter above the tabletop or cradle;

- If the source is above the table, the exposure rate shall be measured at 30 centimeters above the tabletop with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement;

- All C-arm fluoroscopes, both stationary and mobile, shall meet the entrance exposure rate limits at 30 centimeters from the input surface of the fluoroscopic imaging assembly with the source positioned at any available SID provided that the end of the spacer assembly or beam-limiting device is not closer than 30 centimeters from the input surface of the fluoroscopic imaging assembly.

- For a lateral type fluoroscope, the exposure rate shall be measured at a point 15 centimeters from the centerline of the X-ray table and in the direction of the X-ray source with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement. If the tabletop is movable, it shall be positioned as closely as possible to the lateral X-ray source, with the end of the beam-limiting device or spacer no closer than 15 centimeters to the centerline of the X-ray table.

4. Fluoroscopic equipment which is provided with both automatic exposure rate control mode and a manual mode shall not be operable at any combination of tube potential and current which shall result in an exposure rate in excess of 10 roentgens (2.6 mC/kg) per minute in either mode at the point where the center of the useful beam enters the patient, except:

- During recording of fluoroscopic images; or

- When the mode or modes have an optional high level control, in which case the mode or modes shall not be operable at any combination of tube potential and current which shall result in an exposure rate in excess of 5 roentgens (1.3 mC/kg) per minute at the point where the center of the useful beam enters the patient, unless the high level control is activated. Special means of activation of high level controls shall be required. The high level control shall only be operable when continuous manual activation is provided by the operator. A continuous signal audible to the fluoroscopist shall indicate that the high level control is being employed.

5. Any fluoroscopic equipment manufactured after May 19, 1995, which can exceed 5 roentgens (1.3 mC/kg) per minute shall be equipped with an automatic exposure rate control. All entrance exposure rate limits shall be 10 roentgens (2.6 mC/kg) per minute with an upper limit of 20 roentgens (5.2 mC/kg) per minute when the high level control is activated.

6. Conditions of periodic measurement of maximum entrance exposure rate are as follows:

- The measurement shall be made under the conditions that satisfy the requirements of 41.1(5)“c”(1)“3”;

- The kVp, mA, or other selectable parameters shall be adjusted to those settings which give the maximum entrance exposure rate;

- The X-ray system(s) that incorporates automatic exposure rate control shall have sufficient attenuative material placed in the useful beam to produce either a milliamperage or kilovoltage or both to satisfy the conditions of 41.1(5)“c”(1)“3.”

(2) Reserved.

d. Barrier transmitted radiation rate limits.

(1) The exposure rate due to transmission through the primary protective barrier with the attenuation block in the useful beam, combined with radiation from the image intensifier, if provided, shall not exceed 2 milliroentgens (0.516 μ C/kg) per hour at 10 centimeters from any accessible surface of the fluoroscopic imaging assembly beyond the plane of the image receptor for each roentgen per minute of entrance exposure rate.

(2) Measuring compliance of barrier transmission.

1. The exposure rate due to transmission through the primary protective barrier combined with radiation from the image intensifier shall be determined by measurements averaged over an area of 100 square centimeters with no linear dimension greater than 20 centimeters.

2. If the source is below the tabletop, the measurement shall be made with the input surface of the fluoroscopic imaging assembly positioned 30 centimeters above the tabletop.

3. If the source is above the tabletop and the SID is variable, the measurement shall be made with the end of the beam-limiting device or spacer as close to the tabletop as it can be placed, provided that it shall not be closer than 30 centimeters.

4. Movable grids and compression devices shall be removed from the useful beam during the measurement.

e. Indication of potential and current. During fluoroscopy and cinefluorography the kV and the mA shall be continuously indicated.

f. Source-to-skin distance. The SSD shall not be less than:

(1) 38 centimeters on stationary fluoroscopes installed on or after August 1, 1974,

(2) 35.5 centimeters on stationary fluoroscopes which were in operation prior to August 1, 1974,

(3) 30 centimeters on all mobile fluoroscopes, and

(4) 20 centimeters for mobile fluoroscopes used for specific surgical application.

(5) The written safety procedures must provide precautionary measures to be adhered to during the use of this device in addition to the procedures provided in 41.1(3)“a”(4).

g. Fluoroscopic timer.

(1) Means shall be provided to preset the cumulative on-time of the fluoroscopic X-ray tube. The maximum cumulative time of the timing device shall not exceed five minutes without resetting.

(2) A signal audible to the fluoroscopist shall indicate the completion of any preset cumulative on-time. Such signal shall continue to sound while X-rays are produced until the timing device is reset.

h. Control of scattered radiation.

(1) Fluoroscopic table designs when combined with procedures utilized shall be such that no unprotected part of any staff or ancillary individual's body shall be exposed to unattenuated scattered radiation which originates from under the table. The attenuation required shall be not less than 0.25 millimeter lead equivalent.

(2) Equipment configuration when combined with procedures shall be such that no portion of any staff or ancillary individual's body, except the extremities, shall be exposed to the unattenuated scattered radiation emanating from above the tabletop unless that individual:

1. Is at least 120 centimeters from the center of the useful beam, or

2. The radiation has passed through not less than 0.25 millimeter lead equivalent material including, but not limited to, drapes, Bucky-slot cover panel, or self-supporting curtains, in addition to any lead equivalency provided by the protective apron referred to in 41.1(3)“a”(5).

(3) The agency may grant exemptions to 41.1(5)“h”(2) where a sterile field will not permit the use of the normal protective barriers. Where the use of prefitted sterilized covers for the barriers is practical, the agency shall not permit such exemption.

i. Spot-film exposure reproducibility. Fluoroscopic systems equipped with spot-film (radiographic) mode shall meet the exposure reproducibility requirements of 41.1(6)“d” when operating in the spot-film mode.

j. Radiation therapy simulation systems. Radiation therapy simulation systems shall be exempt from all the requirements of 41.1(5)“a,” “c,” “d,” and “g” provided that:

(1) Such systems are designed and used in such a manner that no individual other than the patient is in the X-ray room during periods of time when the system is producing X-rays; and

(2) Systems which do not meet the requirements of 41.1(5)“g” are provided with a means of indicating the cumulative time that an individual patient has been exposed to X-rays. Procedures shall require in such cases that the timer be reset between examinations.

k. Dose-area-product monitor requirements.

(1) All fluoroscopic equipment installed after July 1, 2002, and used for special procedures (e.g., pacemaker implantation, diagnostic cardiac procedures (catheterization), and therapeutic cardiac

procedures (angioplasty-balloon; stent; directional coronary atherectomy; rotational atherectomy; laser atherectomy; radio frequency ablation; and intravascular brachytherapy)) shall be equipped with a dose-area-product monitor capable of recording the total radiation dose received by a patient when the fluoroscopic tube is used. Equipment used and installed prior to July 1, 2002, shall be retrofitted with the radiation exposure device by January 1, 2004.

(2) Each facility using fluoroscopic equipment for special procedures shall include in the patient's chart and in a log for agency review the patient radiation exposure received per procedure. Adult doses that exceed 300 rad and doses for children (under the age of 18) that exceed 100 rad must be reviewed by the facility's radiation safety committee. The review must document the reason why a dose exceeded 300 rad for adults or 100 rad for children, and the reason must be documented in the committee's minutes. If a facility does not have a radiation safety committee, the facility must provide the agency, within 30 days of the event, documentation stating why the patient's dose exceeded 300 rad for adults or 100 rad for children. Also, if the patient doses noted above are exceeded, the patient's physician must do a follow-up examination of the patient to determine if there is any evidence of dose recorded reaction and to ensure that proper treatment is rendered.

(3) All fluoroscopic radiation detection devices in this subrule shall be calibrated annually or after repair or replacement.

l. Equipment operation.

(1) All imaging formed by the use of fluoroscopic X-ray systems shall be directly viewed and interpreted by a licensed practitioner of the healing arts.

(2) Overhead fluoroscopy shall not be used as a positioning tool for general purpose radiographic examinations.

(3) Facilities that use fluoroscopic X-ray systems shall maintain a record of cumulative fluoroscopic exposure time used and the number of spot films for each examination. This record shall indicate patient identification, type of examination, date of examination, and operator's name.

m. Additional requirements for stationary fluoroscopic systems used for cardiac catheterization procedures.

(1) Protective barriers shall be available for use by individuals whose presence is required in the room during activation of the X-ray tube(s). If a protective barrier includes or consists of a transparent viewing panel, the viewing panel shall afford protection of not less than 0.5 millimeter of lead equivalent.

(2) Protective aprons of not less than 0.25 millimeter of lead equivalent shall be worn in the fluoroscopy room by all individuals (except the patient). Any individual required to be in the room for short periods of time may not be required to wear a protective apron if exposure levels below minimum as seen on film badge reports can be verified. Individuals not using protective aprons should follow ALARA by using time and distance to reduce exposure. Any declared pregnant individual must meet the requirements of 641—40.22(136C).

n. Supervision of fluoroscopy. The use of fluoroscopy by radiologic technologists and radiologic students shall be performed under the direct supervision of a licensed practitioner or an advanced registered nurse practitioner (ARNP), pursuant to 655—subrule 7.2(2), for the purpose of localization to obtain images for diagnostic or therapeutic purposes. The use of fluoroscopy by radiologist assistants shall be as defined in 641—42.6(136C).

41.1(6) *Radiographic systems other than fluoroscopic, dental intraoral, veterinary, or computed tomography X-ray systems.*

a. Beam limitation. The useful beam shall be limited to the area of clinical interest. This shall be considered met if a positive beam-limiting device meeting manufacturer's specifications and the requirements of 41.1(6)"h"(2) have been properly used or if evidence of collimation is shown on at least three sides or three corners of the film (for example, projections from the shutters of the collimator, cone cutting at the corners, or borders at the film's edge.)

(1) General purpose stationary and mobile X-ray systems and veterinarian systems (other than portable) installed after July 1, 1998.

1. Only X-ray systems provided with means for independent stepless adjustment of at least two dimensions of the X-ray field shall be used.

2. A method shall be provided for visually defining the perimeter of the X-ray field.
 - Illuminance shall be greater than 7.5 foot-candles or 80.3 LUX at 100 centimeters or maximum SID whichever is less.
 - The total misalignment of the edges of the visually defined field with the respective edges of the X-ray field along either the length or width of the visually defined field shall not exceed 2 percent of the distance from the source to the center of the visually defined field when the surface upon which it appears is perpendicular to the axis of the X-ray beam.
3. The agency may grant an exemption on noncertified X-ray systems to 41.1(6)“a”(1)“1” and “2” provided the registrant makes a written application for such exemption and in that application demonstrates it is impractical to comply with 41.1(6)“a”(1)“1” and “2”; and the purpose of 41.1(6)“a”(1)“1” and “2” will be met by other methods.
 - (2) Additional requirements for stationary general purpose X-ray systems. In addition to the requirements of 41.1(6)“a”(1), stationary general purpose X-ray systems, both certified and noncertified, shall meet the following requirements:
 1. A method shall be provided to indicate when the axis of the X-ray beam is perpendicular to the plane of the image receptor, to align the center of the X-ray field with respect to the center of the image receptor to within 2 percent of the SID, and to indicate the SID to within 2 percent;
 2. The beam-limiting device shall indicate numerically the field size in the plane of the image receptor to which it is adjusted; and
 3. Indication of field size dimensions and SIDs shall be specified in inches or centimeters, and shall be such that aperture adjustments result in X-ray field dimensions in the plane of the image receptor which correspond to those indicated by the beam-limiting device to within 2 percent of the SID when the beam axis is indicated to be perpendicular to the plane of the image receptor.
 - (3) X-ray systems designed for one image receptor size. Radiographic equipment designed for only one image receptor size at a fixed SID shall be provided with means to limit the field at the plane of the image receptor to dimensions no greater than those of the image receptor, and to align the center of the X-ray field with the center of the image receptor to within 2 percent of the SID, or shall be provided with means to both size and align the X-ray field such that the X-ray field at the plane of the image receptor does not extend beyond any edge of the image receptor.
 - (4) Systems designed for or provided with special attachments for mammography. Rescinded IAB 4/8/98, effective 7/1/98.
 - (5) X-ray systems other than those described in 41.1(6)“a”(1), (2), and (3), and veterinary systems installed prior to July 1, 1998, and all portable veterinary X-ray systems.
 1. Means shall be provided to limit the X-ray field in the plane of the image receptor so that such field does not exceed each dimension of the image receptor by more than 2 percent of the SID when the axis of the X-ray beam is perpendicular to the plane of the image receptor.
 2. Means shall be provided to align the center of the X-ray field with the center of the image receptor to within 2 percent of the SID, or means shall be provided to both size and align the X-ray field such that the X-ray field at the plane of the image receptor does not extend beyond any edge of the image receptor. Compliance shall be determined with the axis of the X-ray beam perpendicular to the plane of the image receptor.
 3. 41.1(6)“a”(5)“1” and “2” may be met with a system that meets the requirements for a general purpose X-ray system as specified in 41.1(6)“a”(1) or, when alignment means are also provided, may be met with either:
 - An assortment of removable, fixed-aperture, beam-limiting devices sufficient to meet the requirement for each combination of image receptor size and SID for which the unit is designed with each such device having clear and permanent markings to indicate the image receptor size and SID for which it is designed; or
 - A beam-limiting device having multiple fixed apertures sufficient to meet the requirement for each combination of image receptor size and SID for which the unit is designed. Permanent, clearly legible markings shall indicate the image receptor size and SID for which each aperture is designed and shall indicate which aperture is in position for use.

b. Radiation exposure control devices.

(1) Timers.

1. Means shall be provided to initiate the radiation exposure by a deliberate action on the part of the operator, such as the depression of a switch. Radiation exposure shall not be initiated without such an action.

2. Means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, a preset number of pulses, or a preset radiation exposure to the image receptor. In addition, it shall not be possible to make an exposure when the timer is set to a "zero" or "off" position if either position is provided. Except for dental panoramic systems, termination of an exposure shall cause automatic resetting of the timer to its initial setting or to "zero."

(2) X-ray control.

1. Manual exposure control. An X-ray control shall be incorporated into each X-ray system such that an exposure can be terminated by the operator at any time except for exposure of one-half second or less, or during serial radiography when means shall be provided to permit completion of any single exposure of the series in process.

2. Each X-ray control shall be located in such a way as to meet the following requirements: Stationary X-ray systems (except podiatry and veterinary units) shall be required to have the X-ray exposure switch permanently mounted in a protected area so that the operator is required to remain in that protected area during the entire exposure and so that the operator can view the patient while making any exposures; and mobile and portable X-ray systems which are:

- Used for greater than one week in the same location, i.e., a room or suite, shall meet the requirements of 41.1(6) "b"(2)"2"; or

- Used for greater than one hour and less than one week at the same location, i.e., a room or suite, or in a clinical setting for routine extremities only, or where moving the X-ray system from room to room is impractical, shall meet the requirement of the above paragraph or be provided with a 6.5 foot (1.98 m) high protective barrier which is placed at least 2.7 meters (9 feet) from the tube housing assembly. Written procedures must instruct the operator to remain in the protected area during the entire exposure. Stationary podiatric systems which do not meet the above requirements shall be provided with a 9-foot exposure button cord which allows the operator to remain behind a protective barrier during the entire exposure. If the protective barrier is moveable, written procedures must be on file at the facility, which dictate that the operator will remain behind the barrier during the entire exposure.

3. The X-ray control shall provide visual indication observable at or from the operator's protected position whenever X-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated.

(3) Automatic exposure controls. When an automatic exposure control is provided:

1. Indication shall be made on the control panel when this mode of operation is selected;

2. If the X-ray tube potential is equal to or greater than 50 kVp, the minimum exposure time for field emission equipment rated for pulsed operation shall be equal to or less than a time interval equivalent to 2 pulses;

3. The minimum exposure time for all equipment other than that specified in 41.1(6) "b"(3)"2" shall be equal to or less than one-sixtieth second or a time interval required to deliver 5 mAs, whichever is greater;

4. Either the product of peak X-ray tube potential, current, and exposure time shall be limited to not more than 60 kW per exposure, or the product of X-ray tube current and exposure time shall be limited to not more than 600 mAs per exposure except that, when the X-ray tube potential is less than 50 kVp, the product of X-ray tube current and exposure time shall be limited to not more than 2000 mAs per exposure; and

5. A visible signal shall indicate when an exposure has been terminated at the limits required by 41.1(6) "b"(3)"4," and manual resetting shall be required before further automatically timed exposures can be made.

(4) **Reproducibility.** With a timer setting of 0.5 seconds or less, the average exposure period (T) shall be greater than or equal to five times the maximum exposure period (T_{\max}) minus the minimum exposure period (T_{\min}) when four timer tests are performed:

$$\bar{T} \geq 5 (T_{\max} - T_{\min})$$

(5) **Exposure duration (timer) linearity.** For systems having independent selection of exposure time settings, the average ratios (X_1) of exposure to the indicated timer setting, in units of $C \text{ kg}^{-1}\text{s}^{-1}$ (mR/s), obtained at any two clinically used timer settings shall not differ by more than 0.10 times their sum. This is written as:

$$(X_1 - X_2) \leq 0.1 (X_1 + X_2)$$

where X_1 and X_2 are the average $C \text{ kg}^{-1}\text{s}^{-1}$ (mR/s) values.

c. **Source-to-skin distance.** All mobile or portable radiographic systems shall be provided with means to limit the source-to-skin distance to equal to or greater than 30 centimeters except for veterinary systems.

d. **Exposure reproducibility.** When all technique factors are held constant, including control panel selections associated with automatic exposure control systems, the coefficient of variation of exposure for both manual and automatic exposure control systems shall not exceed 0.05. This requirement applies to clinically used techniques.

e. **Radiation from capacitor energy storage equipment in standby status.** Radiation emitted from the X-ray tube when the system is fully charged and the exposure switch or timer is not activated shall not exceed a rate of 2 milliroentgens ($0.516 \mu\text{C}/\text{kg}$) per hour at 5 centimeters from any accessible surface of the diagnostic source assembly, with the beam-limiting device fully open.

f. **Accuracy.** Deviation of measured technique factors from indicated values of kVp and exposure time shall not exceed the limits specified for that system by its manufacturer. In the absence of manufacturer's specifications, the deviation shall not exceed 10 percent of the indicated value for kVp and 20 percent for time.

g. **mA/mAs linearity.** The following requirements apply when the equipment is operated on a power supply as specified by the manufacturer for any fixed X-ray tube potential within the range of 40 percent to 100 percent of the maximum rated:

(1) Equipment having independent selection of X-ray tube current (mA). The average ratios (X_i) of exposure to the indicated milliamperere-seconds product ($C \text{ kg}^{-1}\text{mAs}^{-1}$ (or mR/mAs)) obtained at any two consecutive tube current settings shall not differ by more than 0.10 times their sum:

$$X_1 - X_2 \leq 0.10 (X_1 + X_2)$$

where X_1 and X_2 are the average values obtained at each of two consecutive tube current settings, or at two settings differing by no more than a factor of 2 where the tube current selection is continuous.

(2) Equipment having a combined X-ray tube current-exposure time product (mAs) selector, but not a separate tube current (mA) selector. The average ratios (X_i) of exposure to the indicated milliamperere-seconds product, in units of mR/mAs (or $C \text{ kg}^{-1}\text{mAs}^{-1}$), obtained at any two consecutive mAs selector settings shall not differ by more than 0.10 times their sum:

$$X_1 - X_2 \leq 0.10 (X_1 + X_2)$$

where X_1 and X_2 are the average values obtained at any two consecutive mAs selector settings, or at two settings differing by no more than a factor of 2 where the mAs selector provides continuous selection.

(3) **Measuring compliance.** Determination of compliance shall be based on 10 exposures taken within a time period of one hour, at each of the two settings. These two settings may include any two focal spot sizes except where one is equal to or less than 0.45 millimeters and the other is greater than

0.45 millimeters. For purposes of this requirement, focal spot size is the nominal focal spot size specified by the X-ray tube manufacturer.

h. Additional requirements applicable to certified systems only. Diagnostic X-ray systems incorporating one or more certified component(s) shall be required to comply with the following additional requirement(s) which relate to that certified component(s).

(1) Beam limitation for stationary and mobile general purpose X-ray systems.

1. There shall be provided a means of stepless adjustment of the X-ray field. The minimum field size at an SID of 100 centimeters shall be equal to or less than 5 centimeters by 5 centimeters.

2. When a light localizer is used to define the X-ray field, it shall provide an average illumination of not less than 160 lux or 15 foot-candles at 100 centimeters or at the maximum SID, whichever is less. The average illumination shall be based upon measurements made in the approximate center of each quadrant of the light field. Radiation therapy simulation systems manufactured on and after May 27, 1980, are exempt from this requirement.

3. The edge of the light field at 100 centimeters or at the maximum SID, whichever is less, shall have a contrast ratio, corrected for ambient lighting, of not less than 4 in the case of beam-limiting devices designed for use on stationary equipment, and a contrast ratio of not less than 3 in the case of beam-limiting devices designed for use on mobile equipment. The contrast ratio is defined as I_1/I_2 where I_1 is the illumination 3 millimeters from the edge of the light field toward the center of the field; and I_2 is the illumination 3 millimeters from the edge of the light field away from the center of the field. Compliance shall be determined with a measuring instrument aperture of 1 millimeter in diameter.

(2) Beam limitation and alignment on stationary general purpose X-ray systems equipped with PBL. If PBL is being used, the following requirements shall be met:

1. PBL shall prevent the production of X-rays when

- Either the length or width of the X-ray field in the plane of the image receptor differs, except as permitted by 41.1(6) "h"(3), from the corresponding image receptor dimensions by more than 3 percent of the SID; or

- The sum of the length and width differences as stated in 41.1(6) "h"(2)"1" above without regard to sign exceeds 4 percent of the SID;

2. Compliance with 41.1(6) "h"(2)"1" shall be determined when the equipment indicates that the beam axis is perpendicular to the plane of the image receptor. Compliance shall be determined no sooner than 5 seconds after insertion of the image receptor;

3. The PBL system shall be capable of operation, at the discretion of the operator, such that the size of the field may be made smaller than the size of the image receptor through stepless adjustment of the field size. The minimum field size at an SID of 100 centimeters shall be equal to or less than 5 centimeters by 5 centimeters;

4. The PBL system shall be designed such that if a change in image receptor does not cause an automatic return to PBL function as described in 41.1(6) "h"(2)"1," then any change of image receptor size or SID must cause the automatic return.

(3) Beam limitation for portable X-ray systems. Beam limitation for portable X-ray systems shall meet the beam limitation requirements of 41.1(6) "a" or 41.1(6) "h"(2).

i. Tube stands for portable X-ray systems. A tube stand or other mechanical support shall be used for portable X-ray systems, so that the X-ray tube housing assembly need not be handheld during exposures.

j. Systems used in a clinical (nonsurgical) setting shall be restricted to one room within a location or suite which meets the requirements of 41.1(3) "d."

41.1(7) Intraoral dental radiographic systems. In addition to the provisions of 41.1(3) and 41.1(4), the requirements of 41.1(7) apply to X-ray equipment and associated facilities used for dental radiography. Requirements for extraoral dental radiographic systems are covered in 41.1(6). Only systems meeting the requirements of 41.1(7) shall be used. Additional requirements specific to handheld dental X-ray equipment are outlined in 41.1(7) "i."

a. Source-to-skin distance. X-ray systems designed for use with an intraoral image receptor shall be provided with means to limit source-to-skin distance to not less than:

(1) 18 centimeters if operable above 50 kVp, or

(2) 10 centimeters if not operable above 50 kVp.

b. Beam limitation. Radiographic systems designed for use with an intraoral image receptor shall be provided with means to limit the X-ray beam such that:

(1) If the minimum source-to-skin distance (SSD) is 18 centimeters or more, the X-ray field, at the minimum SSD, shall be containable in a circle having a diameter of no more than 7 centimeters; and

(2) If the minimum SSD is less than 18 centimeters, the X-ray field, at the minimum SSD, shall be containable in a circle having a diameter of no more than 6 centimeters.

(3) The position indicating device shall be shielded and open-ended. The shielding shall be equivalent to the requirements of 41.1(4)“c.”

c. Exposure control.

(1) Exposure initiation.

1. Means shall be provided to initiate the radiation exposure by a deliberate action on the part of the operator, such as the depression of a switch. Radiation exposure shall not be initiated without such an action; and

2. It shall not be possible to make an exposure when the timer is set to a “zero” or “off” position if either position is provided.

(2) Exposure indication. Means shall be provided for visual indication observable at or from the operator’s protected position whenever X-rays are produced. In addition, a signal audible to the operator shall indicate that the exposure has terminated except in X-ray systems that cannot be altered to meet this requirement.

(3) Exposure termination.

1. Means shall be provided to terminate the exposure at a preset time interval, preset product of current and time, a preset number of pulses, or a preset radiation exposure to the image receptor. In addition:

2. Termination of exposure shall cause automatic resetting of the timer to its initial setting or to “zero.”

3. An X-ray control shall be incorporated into each X-ray system such that an exposure can be terminated by the operator at any time, except for exposures of one-half ($\frac{1}{2}$) second or less.

(4) Exposure duration (timer) linearity. For systems having independent selection of exposure time settings, the average ratios (X_1) of exposure to the indicated timer setting, in units of $C\ kg^{-2}s^{-1}$ (mR/s), obtained at any two clinically used timer settings shall not differ by more than 0.10 times their sum. This is written as:

$$(X_1 - X_2) \leq 0.1 (X_1 + X_2)$$

where X_1 and X_2 are the average values.

(5) Each X-ray exposure switch shall be located in such a way as to meet the following requirements:

1. Stationary X-ray systems shall be required to have the X-ray exposure switch located in a protected area or have an exposure switch cord of sufficient length to permit the operator to activate the equipment while in a protected area, e.g., corridor outside the operator. The procedures required under 41.1(3)“a”(4) must instruct the operator to remain in the protected area during the entire exposure.

2. Mobile and portable X-ray systems which are:

- Used for greater than one week in the same location, i.e., a room or suite, shall meet the requirements of 41.1(7)“c”(5)“1.”

- Used for greater than one hour and less than one week at the same location, i.e., a room or suite, shall meet the requirements of the above paragraph or be provided with a 6.5 foot (1.98 m) high protective barrier or means to allow the operator to be at least 6 feet (1.8 meters) from the tube housing assembly while making exposure.

3. Portable dental X-ray systems designed with a backscatter shield may be used without an additional protective barrier, but the operator must stand directly behind the equipment to allow the shield to function as designed.

d. Reproducibility. When the equipment is operated on an adequate power supply as specified by the manufacturer, the estimated coefficient of variation of radiation exposures shall be no greater than 0.05, for any specific combination of selected technique factors.

e. mA/mS linearity. The following requirements apply when the equipment is operated on a power supply as specified by the manufacturer for any fixed X-ray tube potential within the range of 40 percent to 100 percent of the maximum rated.

(1) Equipment having independent selection of X-ray tube current (mA). The average ratios (X_1) of exposure to the indicated milliamperere-seconds product, in units of $C\text{ kg}^{-1}\text{ mAs}^{-1}$ (or mR/mAs), obtained at any two consecutive tube current settings shall not differ by more than 0.10 times their sum:

$$(X_1 - X_2) \leq 0.1 (X_1 + X_2)$$

where X_1 and X_2 are the average values obtained at each of two consecutive tube current settings, or at two settings differing by no more than a factor of 2 where the tube current selection is continuous.

(2) Equipment having a combined X-ray tube current-exposure time product (mAs) selector, but not a separate tube current (mA) selector. The average ratios (X_1) of exposure to the indicated milliamperere-seconds product, in units of $C\text{ kg}^{-1}\text{ mAs}^{-1}$ (or mR/mAs), obtained at any two consecutive mAs selector settings shall not differ by more than 0.10 times their sum:

$$(X_1 - X_2) \leq 0.1 (X_1 + X_2)$$

where X_1 and X_2 are the average values obtained at any two mAs selector settings, or at two settings differing by no more than a factor of 2 where the mAs selector provides continuous selection.

(3) Measuring compliance. Determination of compliance shall be based on 10 exposures taken within a time period of one hour, at each of the two settings. These two settings may include any two focal spot sizes except where one is equal to or less than 0.45 millimeters and the other is greater than 0.45 millimeters. For purposes of this requirement, focal spot size is the nominal focal spot size specified by the X-ray tube manufacturer.

f. Accuracy. Deviation of technique factors from indicated values for kVp and exposure time (if time is independently selectable) shall not exceed the limits specified for that system by its manufacturer. In the absence of manufacturer's specifications the deviation shall not exceed 10 percent of the indicated value for kVp and 20 percent for time.

g. kVp limitations. Dental X-ray machine with a nominal fixed kVp of less than 50 kVp shall not be used to make diagnostic dental radiographs of humans.

h. Administrative controls.

(1) Patient and film holding devices shall be used when the techniques permit.
 (2) The tube housing and the PID for stationary or mobile systems shall not be held by the operator during an exposure.
 (3) The X-ray system shall be operated in such a manner that the useful beam at the patient's skin does not exceed the requirements of 41.1(7) "b"(1).

(4) Dental fluoroscopy without image intensification shall not be used.

i. Handheld dental X-ray systems. Only equipment specifically designed by the manufacturer to be held by the operator for intraoral dental X-ray exposures is allowed to be operated pursuant to this subrule.

(1) Operators shall be specifically trained to operate the equipment. Records of training shall be kept at the facility until the operator is no longer an employee or until the equipment is removed from the facility.

(2) Protective aprons of not less than 0.25 millimeter lead equivalent shall be provided for operators to wear while operating the equipment.

(3) Dosimetry shall be provided for operators who are expected to exceed 10 percent of the annual occupational dose limit as outlined in 641—40.84(136C).

(4) Operators shall operate the equipment according to the manufacturer's instructions.

(5) The image receptor used must be digital radiography (DR), computed radiography (CR), or intraoral film with a speed class designated as “E/F” or a film with a faster speed designation than “F” or “E/F.”

(6) No individual except the equipment operator may be within a radius of at least 6 feet from the patient during exposures.

(7) The equipment shall not be operated unless the backscatter shield is in place as designed by the manufacturer.

(8) The equipment shall not be operated in hallways, waiting rooms, or other areas where access for individuals of the general public cannot be controlled.

(9) The equipment shall be held without any motion during a patient examination. If the operator has difficulty in holding the equipment stationary, the operator shall use a tube stand. The equipment shall be operated on a tube stand whenever practicable to avoid unnecessary motion and retakes.

(10) When not in use, the equipment shall be stored in a manner that would prevent inadvertent exposures or use by unauthorized individuals.

41.1(8) Rescinded IAB 6/4/97, effective 7/9/97.

41.1(9) *Bone densitometry units.*

a. No additional shielding for the room is required.

b. Film badges, OSL devices, or TLDs must be issued for the first six months to all personnel operating the unit. If monitoring indicates no exposure, the IDPH may allow discontinuance of monitoring upon written request. When new procedures are started that have not been previously monitored, monitoring must be reinstated for six months and another request for discontinuance submitted to the agency.

c. Rescinded IAB 2/6/13, effective 3/13/13.

d. Specific operating procedures must be prepared and made available at the operator’s position.

e. Bone densitometry on human patients shall be conducted only under a prescription of a licensed physician, a licensed physician assistant as defined in Iowa Code section 148C.1, subsection 6, or a licensed registered nurse who is registered as an advanced registered nurse practitioner pursuant to Iowa Code chapter 152.

f. During the operation of the bone densitometry system:

(1) The operator, ancillary personnel, and members of the general public shall be positioned at least one meter from the patient and bone densitometry system during the examination.

(2) The operator shall advise the patient that the bone densitometry examination is a type of X-ray procedure.

g. Equipment shall be maintained and operated in accordance with the manufacturer’s specifications. Records of maintenance shall be kept for inspection by the agency.

41.1(10) *Veterinary medicine radiographic installations.*

a. *Equipment.*

(1) The protective tube housing shall be equivalent to the requirements of 41.1(4)“c.”

(2) Diaphragms or cones shall be provided for collimating the useful beam to the area of clinical interest and shall provide the same degree of protection as is required of the housing.

(3) The total filtration permanently in the useful beam shall not be less than 0.5 millimeters aluminum equivalent for machines operating up to 50 kVp, 1.5 millimeters aluminum equivalent for machines operating between 50 and 70 kVp, and 2.5 millimeters aluminum equivalent for machines operating above 70 kVp.

b. *Operator protection.*

(1) All wall, ceiling, and floor areas shall be equivalent to or provided with applicable protective barriers to ensure compliance with 641—40.15(136C) and 40.21(136C) and subrule 40.26(1).

(2) All stationary, mobile or portable X-ray systems shall be provided with either a 2 meter (6.5 feet) high protective barrier for operator protections during exposures, or shall be provided with means to allow the operator to be at least 2.7 meters (9 feet) from the tube housing assembly during exposures.

c. *Operating procedures.* Veterinary medicine radiographic installations are exempt from the requirements of 641—41.1(136C) except for 641—subrules 41.1(3) and 41.1(10).

(1) No individual other than the operator shall be in the X-ray room while exposures are being made unless such individual's assistance is required, and

(2) The operator shall stand behind the protective barrier of 9 feet from the useful beam and the animal during radiographic exposures, or

(3) When an animal must be held in position during radiography, mechanical supporting or restraining devices should be used. If the animal must be held by an individual, that individual shall be protected with appropriate shielding devices, such as protective gloves and apron, and shall be so positioned that no part of the holder's body will be struck by the useful beam. The exposure of any individual used for this purpose shall be monitored.

41.1(11) Computed tomography X-ray systems.

a. Definitions. In addition to the definitions provided in 641—38.2(136C), 641—40.2(136C), and 41.1(2), the following definitions shall be applicable to 41.1(11):

“*Computed tomography dose index*” means the integral from $-7T$ to $+7T$ of the dose profile along a line perpendicular to the tomographic plane divided by the product of the nominal tomographic section thickness and the number of tomograms produced in a single scan, that is:

$$\overline{\text{CTDI}} = \frac{1}{nT} \int_{-7T}^{+7T} D(z) dz$$

where:

z = Position along a line perpendicular to the tomographic plane.

$D(z)$ = Dose at position z .

T = Nominal tomographic section thickness.

n = Number of tomograms produced in a single scan.

This definition assumes that the dose profile is centered around $z = 0$ and that, for a multiple tomogram system, the scan increment between adjacent scans is nT .

“*Contrast scale*” means the change in the linear attenuation coefficient per CTN relative to water, that is:

$$\overline{\text{CS}} = \frac{\mu_x - \mu_w}{\overline{\text{CTN}}_x - \overline{\text{CTN}}_w}$$

where:

μ_x = Linear attenuation coefficient of the material of interest.

μ_w = Linear attenuation coefficient of water.

$\overline{\text{CTN}}_x$ = of the material of interest.

$\overline{\text{CTN}}_w$ = of water.

“*CS*” (see “*Contrast scale*”).

“*CT conditions of operation*” means all selectable parameters governing the operation of a CT X-ray system including, but not limited to, nominal tomographic section thickness, filtration, and the technique factors as defined in 41.1(2).

“*CTDI*” (see “*Computed tomography dose index*”).

“*CT gantry*” means the tube housing assemblies, beam-limiting devices, detectors, and the supporting structures and frames which hold these components.

“*CTN*” (see “*CT number*”).

“*CT number*” means the number used to represent the X-ray attenuation associated with each elemental area of the CT image.

$$\overline{CTN} = \frac{k(\mu_x - \mu_w)}{\mu_w}$$

where:

k = A constant. (The constant has a normal value of 1,000 when the Hounsfield scale of CTN is used.)

μ_x = Linear attenuation coefficient of the material of interest.

μ_w = Linear attenuation coefficient of water.

“Dose profile” means the dose as a function of position along a line.

“Elemental area” means the smallest area within a tomogram for which the X-ray attenuation properties of a body are depicted (see also “Picture element”).

“Multiple tomogram system” means a computed tomography X-ray system which obtains X-ray transmission data simultaneously during a single scan to produce more than one tomogram.

“Noise” means the standard deviation of the fluctuation in CTN expressed as a percentage of the attenuation coefficient of water. Its estimate (S_n) is calculated using the following expression:

$$S_n = \frac{100 \cdot \overline{CS} \cdot s}{\mu_w}$$

where:

\overline{CS} = Linear attenuation coefficient of the material of interest.

μ_w = Linear attenuation coefficient of water.

s = Estimated standard deviation of the CTN of picture elements in a specified area of the CT image.

“Nominal tomographic section thickness” means the full width at half-maximum of the sensitivity profile taken at the center of the cross-sectional volume over which X-ray transmission data are collected.

“Picture element” means an elemental area of a tomogram.

“Reference plane” means a plane which is displaced from and parallel to the tomographic plane.

“Scan” means the complete process of collecting X-ray transmission data for the production of a tomogram. Data can be collected simultaneously during a single scan for the production of one or more tomograms.

“Scan increment” means the amount of relative displacement of the patient with respect to the CT X-ray system between successive scans measured along the direction of such displacement.

“Scan sequence” means a preselected set of two or more scans performed consecutively under preselected CT conditions of operation.

“Scan time” means the period of time between the beginning and end of X-ray transmission data accumulation for a single scan.

“Single tomogram system” means a CT X-ray system which obtains X-ray transmission data during a scan to produce a single tomogram.

“Tomographic plane” means that geometric plane which is identified as corresponding to the output tomogram.

“Tomographic section” means the volume of an object whose X-ray attenuation properties are imaged in a tomogram.

b. Requirements for equipment.

(1) Termination of exposure.

1. Means shall be provided to terminate the X-ray exposure automatically by either deenergizing the X-ray source or shuttering the X-ray beam in the event of equipment failure affecting data collection. Such termination shall occur within an interval that limits the total scan time to no more than 110 percent of its preset value through the use of either a backup timer or devices which monitor equipment function.

2. A visible signal shall indicate when the X-ray exposure has been terminated through the means required by 41.1(11)“b”(1)“1.”

3. The operator shall be able to terminate the X-ray exposure at any time during a scan, or series of scans under CT X-ray system control, of greater than one-half second duration.

(2) Tomographic plane indication and alignment.

1. For any single tomogram system, means shall be provided to permit visual determination of the tomographic plane or a reference plane offset from the tomographic plane.

2. For any multiple tomogram system, means shall be provided to permit visual determination of the location of a reference plane. This reference plane can be offset from the location of the tomographic planes.

3. If a device using a light source is used to satisfy 41.1(11) "b"(2)"1" or "2," the light source shall provide illumination levels sufficient to permit visual determination of the location of the tomographic plane or reference plane under ambient light conditions of up to 500 lux.

(3) Beam-on and shutter status indicators and control switches.

1. The CT X-ray control and gantry shall provide visual indication whenever X-rays are produced and, if applicable, whether the shutter is open or closed.

2. Each emergency button or switch shall be clearly labeled as to its function.

(4) Indication of CT conditions of operation. The CT X-ray system shall be designed such that the CT conditions of operation to be used during a scan or a scan sequence shall be indicated prior to the initiation of a scan or a scan sequence. On equipment having all or some of these conditions of operation at fixed values, this requirement may be met by permanent markings. Indication of CT conditions of operation shall be visible from any position from which scan initiation is possible.

(5) Extraneous radiation. When data are not being collected for image production, the radiation adjacent to the tube port shall not exceed that permitted by 41.1(4) "c."

(6) Maximum surface CTDI identification. The angular position where the maximum surface CTDI occurs shall be identified to allow for reproducible positioning of a CT dosimetry phantom.

(7) Additional requirements applicable to CT X-ray systems containing a gantry manufactured after September 3, 1985.

1. The total error in the indicated location of the tomographic plane or reference plane shall not exceed 5 millimeters.

2. If the X-ray production period is less than one-half second, the indication of X-ray production shall be actuated for at least one-half second. Indicators at or near the gantry shall be discernible from any point external to the patient opening where insertion of any part of the human body into the primary beam is possible.

3. The deviation of indicated scan increment versus actual increment shall not exceed plus or minus 1 millimeter with any mass from 0 to 100 kilograms resting on the support device. The patient support device shall be incremented from a typical starting position to the maximum incremented distance or 30 centimeters, whichever is less, and then returned to the starting position. Measurement of actual versus indicated scan increment may be taken anywhere along this travel.

4. Premature termination of the X-ray exposure by the operator shall necessitate resetting of the CT conditions of operation prior to the initiation of another scan.

c. Facility design requirements.

(1) Aural communication. Provision shall be made for two-way aural communication between the patient and the operator at the control panel.

(2) Viewing systems.

1. Windows, mirrors, closed-circuit television, or an equivalent shall be provided to permit continuous observation of the patient during irradiation and shall be so located that the operator can observe the patient from the control panel.

2. When the primary viewing system is by electronic means, an alternate viewing system (which may be electronic) shall be available for use in the event of failure of the primary viewing system.

d. Surveys, calibrations, spot checks, and operating procedures.

(1) Surveys.

1. All CT X-ray systems shall have a survey made by, or under the direction of, a qualified expert. In addition, such surveys shall be done after any change in the facility or equipment which might cause a significant increase in radiation hazard.

2. The registrant shall obtain a written report of the survey from the qualified expert, and a copy of the report shall be made available to the agency upon request.

(2) Radiation calibrations.

1. The calibration of the radiation output of the CT X-ray system shall be performed by, or under the direction of, a qualified expert who is physically present at the facility during such calibration.

2. The calibration of a CT X-ray system shall be performed at intervals specified by a qualified expert and after any change or replacement of components which, in the opinion of the qualified expert, could cause a change in the radiation output.

3. The calibration of the radiation output of a CT X-ray system shall be performed with a calibrated dosimetry system. The calibration of such system shall be traceable to a national standard. The dosimetry system shall have been calibrated within the preceding two years.

4. CT dosimetry phantom(s) shall be used in determining the radiation output of a CT X-ray system. Such phantom(s) shall meet the following specifications and conditions of use: CT dosimetry phantom(s) shall be right circular cylinders of polymethyl methacrylate of density 1.19 plus or minus 0.01 grams per cubic centimeter. The phantom(s) shall be at least 14 centimeters in length and shall have diameters of 32.0 centimeters for testing CT X-ray systems designed to image any section of the body and 16.0 centimeters for systems designed to image the head or for whole body scanners operated in the head scanning mode; CT dosimetry phantom(s) shall provide means for the placement of a dosimeter(s) along the axis of rotation and along a line parallel to the axis of rotation 1.0 centimeter from the outer surface and within the phantom. Means for the placement of dosimeters or alignment devices at other locations may be provided; any effects on the doses measured due to the removal of phantom material to accommodate dosimeters shall be accounted for through appropriate corrections to the reported data or included in the statement of maximum deviation for the values obtained using the phantom; and all dose measurements shall be performed with the CT dosimetry phantom placed on the patient couch or support device without additional attenuation materials present.

5. The calibration shall be required for each type of head, body, or whole-body scan performed at the facility.

6. Calibration shall meet the following requirements: The dose profile along the center axis of the CT dosimetry phantom for the minimum, maximum, and midrange values of the nominal tomographic section thickness used by the registrant shall be measurable. Where less than three nominal tomographic thicknesses can be selected, the dose profile determination shall be performed for each available nominal tomographic section thickness; the CTDI^{3/4} along the two axes specified in 41.1(11)“d”(2)“4” shall be measured. (For the purpose of determining the CTDI, the manufacturer’s statement as to the nominal tomographic section thickness for that particular system may be utilized.) The CT dosimetry phantom shall be oriented so that the measurement point 1.0 centimeter from the outer surface and within the phantom is in the same angular position within the gantry as the point of maximum surface CTDI identified. The CT conditions of operation shall correspond to typical values used by the registrant; and the spot checks specified in 41.1(11)“d”(3) shall be made.

7. Calibration procedures shall be in writing. Records of calibrations performed shall be maintained for inspection by the agency.

(3) Spot checks.

1. The spot-check procedures shall be in writing and shall have been developed by a qualified expert.

2. The spot-check procedures shall incorporate the use of a CT dosimetry phantom which has a capability of providing an indication of contrast scale, noise, nominal tomographic section thickness, the resolution capability of the system for low and high contrast objects, and measuring the mean CTN for water or other reference material.

3. All spot checks shall be included in the calibration required by 41.1(11)“d”(2) and at time intervals and under system conditions specified by a qualified expert.

4. Spot checks shall include acquisition of images obtained with the CT dosimetry phantom(s) using the same processing mode and CT conditions of operation as are used to perform calibrations required by 41.1(11)“d”(2). The images shall be retained, until a new calibration is performed, in two forms as follows: photographic copies of the images obtained from the image display device; and images stored in digital form on a storage medium compatible with the CT X-ray system.

5. Written records of the spot checks performed shall be maintained for inspection by the agency.

(4) Operating procedures.

1. The CT X-ray system shall not be operated except by a licensed practitioner or an individual who has been specifically trained in its operation and holds a current permit to practice as a general radiologic technologist as defined under the provisions of 641—Chapter 42.

41.1(12) X-ray machines used for mammography. Rescinded IAB 4/8/98, effective 7/1/98.
[ARC 8659B, IAB 4/7/10, effective 5/12/10; ARC 0577C, IAB 2/6/13, effective 3/13/13; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3103C, IAB 6/7/17, effective 7/12/17; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—41.2(136C) Use of radionuclides in the healing arts.

41.2(1) Purpose and scope.

a. This rule establishes requirements and provisions for the use of radionuclides in the healing arts and for issuance of licenses authorizing the medical use of this material. These requirements and provisions provide for the protection of the public health and safety. The requirements and provisions of this rule are in addition to, and not in substitution for, the applicable portions of 641—Chapters 38 to 40. The requirements and provisions of these rules apply to applicants and licensees subject to this rule unless specifically exempted.

b. All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

41.2(2) Definitions. For the purpose of this chapter, the definitions of 641—Chapters 38 to 40 may also apply. As used in 41.2(136C), the following definitions apply:

“*Area of use*” means a portion of a physical structure that has been set aside for the purpose of receiving, using, or storing radioactive material.

“*Authorized medical physicist*” means an individual who:

- a. Meets the requirements of 41.2(74) and 41.2(77); or
- b. Is identified as an authorized medical physicist or teletherapy physicist on:
 1. A specific medical use license issued by this agency, the NRC, or an agreement state;
 2. A medical use permit issued by an NRC master material licensee;
 3. A permit issued by an NRC or agreement state broad scope medical use licensee; or
 4. A permit issued by an NRC master material license broad scope medical use permittee.

“*Authorized nuclear pharmacist*” means a pharmacist who:

a. Has met the appropriate requirements of 41.2(77) and 41.2(78), or before May 3, 2006, meets the requirements in 10 CFR 35.980(a) and 10 CFR 35.59; or:

b. Is identified as an authorized nuclear pharmacist on:

1. A specific license issued by the agency, NRC or agreement state that authorizes medical use or the practice of nuclear pharmacy;
2. A permit issued by an NRC master material licensee that authorizes medical use or the practice of nuclear pharmacy;
3. A permit issued by the NRC or agreement state broad scope medical use licensee that authorizes medical use or the practice of nuclear pharmacy; or
4. A permit issued by an NRC master material license broad scope medical use permittee that authorizes medical use or the practice of nuclear pharmacy; or

c. Is identified as an authorized nuclear pharmacist by a commercial nuclear pharmacy that has been authorized to identify authorized nuclear pharmacists; or

d. Is designated as an authorized nuclear pharmacist in accordance with 641—39.4(29)“j”(2)“3.”

“*Authorized user*” means a physician, dentist, or podiatrist who has met the appropriate requirements of 41.2(67)“a,” 41.2(68)“a,” 41.2(69)“a,” 41.2(70)“a,” 41.2(72)“a,” 41.2(73)“a,” 41.2(81)“a,” or

41.2(82) “a,” or before May 3, 2006, meets the requirements in 10 CFR 35.910(a), 35.920(a), 35.930(c), 35.940(a), 35.950(a), or 35.960(a) and 10 CFR 35.59; or who is identified on:

1. A current Iowa, NRC, or agreement state license that authorizes the medical use of radioactive material;
2. A permit issued by an NRC master material licensee that is authorized to permit the medical use of radioactive material;
3. A permit issued by an NRC, agreement state, or Iowa-specific licensee of broad scope that is authorized to permit medical use of radioactive material; or
4. A permit issued by an NRC master material license broad scope permittee that is authorized to permit medical use of radioactive material.

“*Dedicated check source*” means a radioactive source that is used to ensure the constant operation of a radiation detection or measurement device over several months or years. This source may also be used for other purposes.

“*Management*” means the chief executive officer or that individual’s designee.

“*Medical institution*” means an organization in which several medical disciplines are practiced.

“*Mobile nuclear medicine service*” means the transportation and medical use of radioactive material.

“*Output*” means the exposure rate, dose rate, or a quantity related in a known manner to these rates from a teletherapy unit for a specified set of exposure conditions.

“*Pharmacist*” means an individual licensed by a state or territory of the United States, the District of Columbia, or the Commonwealth of Puerto Rico to practice pharmacy.

“*Radiation safety officer*” means an individual who, in addition to the definition in 641—38.2(136C), meets the requirements of 41.2(77) and 41.2(65)“a,” or 41.2(65)“c”(1), or before May 3, 2006, meets the requirements in 10 CFR 35.900(a) and 10 CFR 35.59; or is identified as a radiation safety officer on a specific medical use license issued by Iowa, the NRC, or agreement state or a medical use permit issued by an NRC master material licensee.

“*Teletherapy physicist*” means an individual identified as the qualified teletherapy physicist on an agency license.

“*Unit dosage*” means a dosage prepared for medical use for administration as a single dosage to a patient or human research subject without any further manipulation of the dosage after it is initially prepared.

“*Visiting authorized user*” means an authorized user who is not identified on the license of the licensee being visited.

41.2(3) License required.

a. No person shall manufacture, produce, acquire, receive, possess, use, or transfer radioactive material for medical use except in accordance with a specific license issued pursuant to these rules.

b. Unless prohibited by license condition, an individual may receive, possess, use, or transfer radioactive material in accordance with these rules under the supervision of an authorized user as provided in 41.2(11).

c. An individual may prepare unsealed radioactive material for medical use in accordance with these rules under the supervision of an authorized nuclear pharmacist or authorized user as provided in 41.2(11) unless prohibited by license condition.

d. A licensee may conduct research involving human subjects using radioactive material provided that the research is conducted, funded, supported, or regulated by another federal agency which has implemented the Federal Policy for the Protection of Human Subjects. Otherwise, a licensee shall apply for and receive approval of a specific amendment to its license before conducting such research. Both types of licensees shall, at a minimum, obtain informed consent from the human subjects and obtain prior review and approval of the research activities by an Institutional Review Board in accordance with the meaning of these terms as defined and described in the Federal Policy for the Protection of Human Subjects.

Nothing in this subrule relieves the licensee from complying with applicable FDA, federal, and other state requirements governing radioactive drugs or devices.

e. An applicant that satisfies the requirements of 641—paragraph 39.4(28) “*b*” may apply for a Type A specific license of broad scope.

41.2(4) License amendments. A licensee shall apply for and receive a license amendment:

a. Before using radioactive material for a method or type of medical use not permitted by the license issued under this rule;

b. Before permitting anyone, except a visiting authorized user or visiting authorized nuclear pharmacist described in 41.2(12), to work as an authorized user or authorized nuclear pharmacist under the license;

c. Before changing a radiation safety officer, teletherapy physicist or authorized medical physicist;

d. Before receiving radioactive material in excess of the amount authorized on the license;

e. Before adding to or changing the address or addresses of use identified in the application or on the license; and

f. Before changing statements, representations, and procedures which are incorporated into the license.

41.2(5) Notifications.

a. A licensee shall provide to the agency a copy of the board certification, the NRC or agreement state license, or the permit issued by a licensee of broad scope for each individual no later than 30 days after the date that the licensee permits the individual to work as a visiting authorized user or a visiting authorized nuclear pharmacist.

b. A licensee shall notify the agency by letter no later than 30 days after:

(1) An authorized user, an authorized nuclear pharmacist, radiation safety officer, or teletherapy physicist permanently discontinues performance of duties under the license or has a name change; or

(2) The licensee’s mailing address changes.

c. The licensee shall mail the documents required in this subrule to the Iowa Department of Public Health, Des Moines, Iowa.

d. Exemptions regarding Type A specific licenses of broad scope. A licensee possessing a Type A specific license of broad scope for medical use is exempt from the following:

(1) The provision of 41.2(4) “*b*”;

(2) The provisions of 41.2(4) “*e*” regarding additions to or changes in the areas of use only at the addresses specified in the license;

(3) The provision of 41.2(5) “*a*”;

(4) The provisions of 41.2(5) “*b*”(1) for authorized user or an authorized nuclear pharmacist.

41.2(6) Maintenance of records.

a. Each record required by this rule must be legible throughout the retention period specified by each subrule. The record may be original or reproduced copy or a microform, provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period.

b. The record may also be stored on electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records such as letters, drawings, and specifications must include all pertinent information such as stamps, initials, and signatures.

c. The licensee shall maintain adequate safeguards against tampering with and loss of records specified in 41.2(6) “*a*” and “*b*.”

41.2(7) ALARA program.

a. Each licensee shall develop and implement a written program to maintain radiation doses and releases of radioactive material in effluents to unrestricted areas as low as reasonably achievable in accordance with 641—subrule 40.1(3).

b. To satisfy the requirement of 41.2(7) “*a*”:

(1) The management, radiation safety officer, and all authorized users shall participate in the establishment, implementation, and operation of the program as required by these rules or the radiation safety committee; or

(2) For licensees that are not medical institutions, management and all authorized users shall participate in the program as required by the radiation safety officer.

c. The ALARA program shall include an annual review by the radiation safety committee for licensees that are medical institutions, or management and the radiation safety officer for licensees that are not medical institutions, of summaries of the types and amounts of radioactive material used, occupational dose reports, and continuing education and training for all personnel who work with or in the vicinity of radioactive material. The purpose of the review is to ensure that individuals make every reasonable effort to maintain occupational doses, doses to the general public, and releases of radioactive material as low as reasonably achievable, taking into account the state of technology, and the cost of improvements in relation to benefits.

d. The licensee shall retain a current written description of the ALARA program for the duration of the license. The written description shall include:

- (1) A commitment by management to keep occupational doses as low as reasonably achievable;
- (2) A requirement that the radiation safety officer brief management once each year on the radiation safety program;
- (3) Personnel exposure investigational levels as established in accordance with 41.2(9) "b"(8) that, when exceeded, will initiate an investigation by the radiation safety officer of the cause of the exposure; and
- (4) Personnel exposure investigational levels that, when exceeded, will initiate a prompt investigation by the radiation safety officer of the cause of the exposure and a consideration of actions that might be taken to reduce the probability of recurrence.

41.2(8) Radiation safety officer.

a. A licensee shall appoint a radiation safety officer responsible for implementing the radiation safety program. The licensee, through the radiation safety officer, shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's radioactive material program.

b. The radiation safety officer shall:

- (1) Investigate overexposures, accidents, spills, losses, thefts, unauthorized receipts, uses, transfers, and disposals, and other deviations from approved radiation safety practice and implement corrective actions as necessary;
- (2) Implement written policy and procedures for:
 1. Authorizing the purchase of radioactive material;
 2. Receiving and opening packages of radioactive material;
 3. Storing radioactive material;
 4. Keeping an inventory record of radioactive material;
 5. Using radioactive material safely;
 6. Taking emergency action if control of radioactive material is lost;
 7. Performing periodic radiation surveys;
 8. Performing checks and calibrations of survey instruments and other safety equipment;
 9. Disposing of radioactive material;
 10. Training personnel who work in or frequent areas where radioactive material is used or stored;

and

11. Keeping a copy of all records and reports required by the agency rules, a copy of these rules, a copy of each licensing request and license and amendments, and the written policy and procedures required by the rules; and

- (3) For medical use not sited at a medical institution, approve or disapprove radiation safety program changes with the advice and consent of management prior to submittal to the agency for licensing action; or

- (4) For medical use sited at a medical institution, assist the radiation safety committee in the performance of its duties.

41.2(9) Radiation safety committee. Each medical institution licensee shall establish a radiation safety committee to oversee the use of radioactive material.

a. The committee shall meet the following administrative requirements:

(1) Membership must consist of at least three individuals and shall include an authorized user of each type of use permitted by the license, the radiation safety officer, a representative of the nursing service, and a representative of management who is neither an authorized user nor a radiation safety officer. Other members may be included as the licensee deems appropriate.

(2) The committee shall meet at least once each calendar quarter.

(3) Rescinded IAB 10/1/14, effective 11/5/14.

(4) The minutes of each radiation safety committee meeting shall include:

1. The date of the meeting;

2. Members present;

3. Members absent;

4. Summary of deliberations and discussions;

5. Recommended actions and the numerical results of all ballots; and

6. Document any reviews required in 41.2(7) "c" and 41.2(9) "b."

(5) The committee shall provide each member with a copy of the meeting minutes and retain one copy until the agency authorizes its disposition.

b. To oversee the use of licensed material, the committee shall:

(1) Be responsible for monitoring the institutional program to maintain occupational doses as low as reasonably achievable;

(2) Review:

1. Review, on the basis of safety and with regard to the training and experience standards of this rule, and approve or disapprove any individual who is to be listed as an authorized user, an authorized nuclear pharmacist, the radiation safety officer, or teletherapy physicist before submitting a license application or request for amendment or renewal;

2. Review on the basis of the board certification, the license, or the permit identifying an individual, and approve or disapprove any individual prior to allowing that individual to work as an authorized user or authorized nuclear pharmacist.

(3) Review on the basis of safety and approve or disapprove each proposed method of use of radioactive material;

(4) Review on the basis of safety, and approve with the advice and consent of the radiation safety officer and the management representative, or disapprove procedures and radiation safety program changes prior to submittal to the agency for licensing action;

(5) Review quarterly, with the assistance of the radiation safety officer, occupational radiation exposure records of all personnel working with radioactive material;

(6) Review quarterly, with the assistance of the radiation safety officer, all incidents involving radioactive material with respect to cause and subsequent actions taken;

(7) Review annually, with the assistance of the radiation safety officer, the radioactive material program; and

(8) Establish a table of investigational levels for occupational dose that, when exceeded, will initiate investigations and considerations of action by the radiation safety officer.

41.2(10) Authority and responsibilities for the radiation protection program.

a. In addition to the radiation protection program requirements of 641—40.10(136C), a licensee's management shall approve in writing:

(1) Requests for a license application, renewal, or amendment before submittal to this agency;

(2) Any individual before allowing that individual to work as an authorized user, authorized nuclear pharmacist, or authorized medical physicist; and

(3) Radiation protection program changes that do not require a license amendment.

b. A licensee's management shall appoint a radiation safety officer, who agrees, in writing, to be responsible for implementing the radiation protection program. The licensee, through the radiation safety officer, shall ensure that the radiation safety activities are being performed in accordance with licensee-approved procedures and regulatory requirements.

c. For up to 60 days each year, a licensee may permit an authorized user or an individual qualified to be a radiation safety officer under 41.2(65) or 41.2(75) to function as a temporary radiation safety

officer to perform the functions of radiation safety officer, as provided in 41.2(10) “g,” if the licensee takes the actions required in 41.2(10) “b,” “e,” “g,” and “h” and notifies this agency in accordance with 41.2(5).

d. A licensee may simultaneously appoint more than one temporary radiation safety officer in accordance with 41.2(10) “c” if needed to ensure that the licensee has a temporary radiation safety officer who satisfies the requirements to be a radiation safety officer for each of the different types of by-product material permitted on the license.

e. A licensee shall establish the authority, duties, and responsibilities of the radiation safety officer in writing.

f. Licensees that are authorized for two or more different types of uses of radioactive materials or two or more types of units under this rule shall establish a radiation safety committee to oversee all uses of radioactive material permitted by the license.

g. A licensee shall provide the radiation safety officer sufficient authority, organizational freedom, time, resources, and management prerogative to:

- (1) Identify radiation safety problems;
- (2) Initiate, recommend, or provide corrective solutions;
- (3) Verify implementation of corrective actions; and
- (4) Stop unsafe operations.

h. A licensee shall retain a record of actions taken under 41.2(10) in accordance with 641—40.80(136C).

41.2(11) Supervision.

a. A licensee that permits the receipt, possession, use, or transfer of radioactive material by an individual under the supervision of an authorized user as allowed by 41.2(3) shall, in addition to the requirements in 641—40.111(136C):

(1) Instruct the supervised individual in the licensee’s written radiation protection procedures, written directive procedures, rules of this chapter, and license conditions appropriate to that individual’s use of radioactive material;

(2) Review the supervised individual’s use of radioactive material, provide reinstruction as needed and review records kept to reflect this use;

(3) Require the authorized user to be immediately available to communicate with the supervised individual;

(4) Require the authorized user to be able to be physically present and available to the supervised individual on one hour’s notice (the supervising authorized user need not be present for each use of radioactive material); and

(5) Require that only those individuals certified and issued a current permit to practice in accordance with 641—Chapter 42 as a nuclear medicine technologist or a radiation therapist, as applicable, or an Iowa-licensed physician and designated by the authorized user, shall be permitted to administer radionuclides (sealed sources only for radiation therapists) or radiation to patients or human research subjects. For a nuclear medicine technologist or a radiation therapist, the individual’s permit to practice shall be made available at the individual’s place of employment. If the permit holder works at more than one facility, a duplicate of the permit shall be kept at each facility.

b. A license shall require the supervised individual receiving, possessing, using or transferring radioactive material under 41.2(3) to:

(1) Follow the instructions of the supervising authorized user for the medical uses of by-product material;

(2) Follow the written radiation protection and written directive procedures established by the radiation safety officer; and

(3) Comply with these rules and the license conditions with respect to the use of radioactive material.

c. A licensee that permits the preparation of radioactive material for medical use by an individual under the supervision of an authorized nuclear pharmacist or physician who is an authorized user, as allowed by 41.2(3) “c,” shall, in addition to the requirements in 641—40.111(136C):

(1) Instruct the supervised individual in the preparation of radioactive material for medical use and the principles of and procedures for radiation safety and in the licensee's written procedures for maintaining written directives, as appropriate to that individual's use of radioactive material;

(2) Require the supervised individual to follow the instructions of the supervising authorized user or authorized nuclear pharmacist regarding the preparation of radioactive material for medical use, written radiation protection procedures established by the licensee, the regulations of this chapter and license conditions; and

(3) Require the supervising authorized nuclear pharmacist or physician who is an authorized user to periodically review the work of the supervised individual as it pertains to preparing radioactive material for medical use and the records kept to reflect that work.

d. A licensee that supervises an individual is responsible for the acts and omissions of the supervised individual.

41.2(12) *Visiting authorized user and visiting authorized nuclear pharmacist.*

a. A licensee may permit any visiting authorized user or visiting authorized nuclear pharmacist to use licensed material for medical use under the terms of the licensee's license for 60 days each year if:

(1) The visiting authorized user or visiting authorized nuclear pharmacist has the prior written permission of the licensee's management and, if the use occurs on behalf of an institution, the institution's radiation safety committee;

(2) The licensee has a copy of an agency, agreement state, licensing state or U.S. Nuclear Regulatory Commission license that identifies the visiting authorized user or visiting authorized nuclear pharmacist by name as an authorized user for medical use; and

(3) Only those procedures for which the visiting authorized user or visiting authorized nuclear pharmacist is specifically authorized by an agency (agreement state, licensing state or U.S. Nuclear Regulatory Commission) license are performed by that individual.

b. A licensee need not apply for a license amendment in order to permit a visiting authorized user or visiting authorized nuclear pharmacist to use licensed material as described in 41.2(12) "a."

c. A licensee shall retain copies of the records specified in 41.2(12) "a" for five years from the date of the last visit.

41.2(13) *Mobile nuclear medicine service administrative requirements.*

a. The agency will only license mobile nuclear medicine services in accordance with this rule and other applicable requirements of these rules.

b. Mobile nuclear medicine service licensees shall retain for the duration of service a letter signed by the management of each location where services are rendered that authorizes use of radioactive material and clearly delineates the authority of the licensee and client.

c. If a mobile nuclear medicine service provides services that the client is also authorized to provide, the client is responsible for ensuring that services are conducted in accordance with the rules in this chapter while the mobile nuclear medicine service is under the client's direction.

d. A mobile nuclear medicine service shall not have radioactive material delivered directly from the manufacturer or the distributor to the client's address of use.

e. Mobile nuclear medicine service licensees shall also perform the following:

(1) Check instruments used to measure the activity of unsealed radioactive material for proper function before use at each client's address or on each day of use, whichever is more frequent. At a minimum, the check for proper function required by this rule must include a constancy check;

(2) Check survey instruments for proper operation with a dedicated check source before use at each client's address;

(3) Before leaving a client's address, survey all areas of use to ensure compliance with the requirements of 641—Chapters 40 and 41.

41.2(14) *Records and reports of misadministrations and reportable medical events.*

a. When a misadministration or reportable medical event, as defined in 641—38.2(136C), occurs, the licensee shall notify the agency by telephone. The licensee shall also notify the referring physician of the affected patient or human research subject and the patient or human research subject or a responsible relative or guardian, unless the referring physician agrees to inform the patient or human

research subject or believes, based on medical judgment, that telling the patient or human research subject or the patient's or human research subject's responsible relative or guardian would be harmful to one or the other, respectively. These notifications must be made within 24 hours after the licensee discovers the misadministration or reportable medical event. If the referring physician, patient or human research subject, or the patient's or human research subject's responsible relative or guardian cannot be reached within 24 hours, the licensee shall notify them as soon as practicable. The licensee is not required to notify the patient or human research subject or the patient's or human research subject's responsible relative or guardian without first consulting the referring physician; however, the licensee shall not delay medical care for the patient or human research subject because of this notification requirement including remedial care as a result of the misadministration or reportable medical event because of any delay in notification.

b. Written reports.

(1) The licensee shall submit a written report to the agency within 15 days after discovery of the misadministration or reportable medical event. The written report must include the licensee's name, the prescribing physician's name, a brief description of the event, why the event occurred, the effect on the patient or the human research subject, what improvements are needed to prevent recurrence, actions taken to prevent recurrence, whether the licensee notified the patient or the human research subject or the patient's or the human research subject's responsible relative or guardian (this individual will subsequently be referred to as "the patient or the human research subject"), and if not, why not, and if the patient or the human research subject was notified, what information was provided to that individual. The report must not include the patient's or the human research subject's name or other information that could lead to identification of the patient or the human research subject.

(2) If the patient or the human research subject was notified, the licensee shall also furnish, within 15 days after discovery of the misadministration or reportable medical event, a written report to the patient or the human research subject and the referring physician by sending either:

1. A copy of the report that was submitted to the agency; or

2. A brief description of both the event and the consequences as they may affect the patient or the human research subject, provided a statement is included that the report submitted to the agency can be obtained from the licensee.

c. Rescinded IAB 4/4/01, effective 5/9/01.

d. Each licensee shall retain a record of each misadministration for ten years and each reportable medical event for three years. The record shall contain the names of all individuals involved in the event, including the physician, allied health personnel, the patient or human research subject, and the patient's or human research subject's referring physician, the patient's or human research subject's social security number or identification number if one has been assigned, a brief description of the event, why it occurred, the effect on the patient or human research subject, what improvements are needed to prevent recurrence, and the action taken, if any, to prevent recurrence.

e. Aside from the notification requirement, nothing in 41.2(14) "a" to 41.2(14) "d" shall affect any rights or duties of licensees and physicians in relation to each other, patients or human research subjects, or responsible relatives or guardians.

f. Report and notification of a dose to an embryo/fetus or a nursing child.

(1) A licensee shall report any dose to an embryo/fetus that is greater than 5 rem (50 mSv) dose equivalent that is a result of an administration of by-product material or radiation from by-product material to a pregnant individual unless the embryo/fetus was specifically approved, in advance, by the authorized user.

(2) A licensee shall report any dose to a nursing child that is a result of an administration of by-product material to a breast-feeding individual that:

1. Is greater than 5 rem (50 mSv) total effective dose equivalent; or

2. Has resulted in unintended permanent functional damage to an organ or a physiological system of the child, as determined by a physician.

(3) The licensee shall notify this agency by telephone no later than the next calendar day after a dose to the embryo/fetus or nursing child that requires a report in 41.2(14) "f"(1) or (2).

(4) The licensee shall submit a written report to the agency within 15 days after discovery of a dose to the embryo/fetus or nursing child that requires a report in 41.2(14) "f"(1) or (2).

1. The written report must include:

- The licensee's name;
- The name of the prescribing physician;
- A brief description of the event;
- Why the event occurred;
- The effect, if any, on the embryo/fetus or the nursing child;
- What actions, if any, have been taken or are planned to prevent recurrence; and
- Certification that the licensee notified the pregnant individual or mother (or the mother's or child's responsible relative or guardian), and if not, why not.

2. The report must not contain the individual's or child's name or any other information that could lead to identification of the individual or child.

(5) The licensee shall provide notification of the event to the referring physician and also notify the pregnant individual or mother, both hereafter referred to as the mother, no later than 24 hours after discovery of an event that would require reporting under 41.2(14) "f"(1) or (2), unless the referring physician personally informs the licensee either that the physician will inform the mother or that, based on medical judgment, telling the mother would be harmful. The licensee is not required to notify the mother without first consulting with the referring physician. If the referring physician or mother cannot be reached within 24 hours, the licensee shall make the appropriate notifications as soon as possible thereafter. The licensee may not delay any appropriate medical care for the embryo/fetus or for the nursing child, including any necessary remedial care as a result of the event, because of any delay in notification. To meet the requirements of this paragraph, the notification may be made to the mother's or child's responsible relative or guardian instead of the mother. If a verbal notification is made, the licensee shall inform the mother, or the mother's or child's responsible relative or guardian, that a written description of the event can be obtained from the licensee upon request. The licensee shall provide such a written description if requested.

(6) A licensee shall:

1. Annotate a copy of the report provided to the agency with the:

- Name of the pregnant individual or the nursing child who is the subject of the event; and
- Social security number or other identification number, if one has been assigned, of the pregnant individual or the nursing child who is the subject of the event; and

2. Provide a copy of the annotated report to the referring physician, if other than the licensee, no later than 15 days after the discovery of the event.

41.2(15) Suppliers. A licensee shall use for medical use only:

a. Radioactive material manufactured, labeled, packaged, and distributed in accordance with a license issued pursuant to these rules or the equivalent regulations of another agreement state, a licensing state or the U.S. Nuclear Regulatory Commission; and

b. Reagent kits that have been manufactured, labeled, packaged, and distributed in accordance with an approval issued by the U.S. Food and Drug Administration;

c. Teletherapy sources manufactured and distributed in accordance with a license issued pursuant to these rules, or the equivalent regulations of another agreement state, a licensing state, or the U.S. Nuclear Regulatory Commission.

41.2(16) Quality control of imaging equipment. Each licensee shall establish written quality control procedures for all equipment used to obtain images from radionuclide studies. As a minimum, the procedures shall include quality control procedures recommended by equipment manufacturers or procedures which have been approved by the agency. The licensee shall conduct quality control procedures in accordance with written procedures.

41.2(17) Possession, use, calibration, and check of dose calibrators.

a. A medical use licensee authorized to administer radiopharmaceuticals shall possess a dose calibrator and use it to measure the amount of activity administered to each patient or human research subject.

b. A licensee shall:

(1) Check each dose calibrator for constancy with a dedicated check source at the beginning of each day of use. To satisfy the requirement of this section, the check shall be done on frequently used settings with a sealed source of not less than 10 microcuries (370 kBq) of radium-226 or 50 microcuries (1.85 MBq) of any other photon-emitting radionuclide with a half-life greater than 90 days;

(2) Test each dose calibrator for accuracy upon installation and at 12-month intervals thereafter by assaying at least two sealed sources containing different radionuclides, the activity of which the manufacturer has determined within 5 percent of the stated activity, with minimum activity of 10 microcuries (370 kBq) for radium-226 and 50 microcuries (1.85 MBq) for any other photon-emitting radionuclide, and at least one of which has a principal photon energy between 100 keV and 500 keV;

(3) Test each dose calibrator for linearity upon installation and at 3-month intervals thereafter over the range of use between 30 microcuries (1.1 megabecquerels) and the highest dosage that will be administered; and

(4) Test each dose calibrator for geometry dependence upon installation over the range of volumes and volume configurations for which it will be used. The licensee shall keep a record of this test for the duration of the use of the dose calibrator.

c. A licensee shall mathematically correct dosage readings for any geometry or linearity error that exceeds 10 percent if the dosage is greater than 10 microcuries (370 kBq) and shall repair or replace the dose calibrator if the accuracy or constancy error exceeds 10 percent.

d. A licensee shall also perform checks and tests required by 41.2(17)“b” following adjustment or repair of the dose calibrator.

e. A licensee shall retain a record of each check and test required by 41.2(17) for three years. The records required by 41.2(17)“b” shall include:

(1) For 41.2(17)“b”(1), the model and serial number of the dose calibrator, the identity and calibrated activity of the radionuclide contained in the check source, the date of the check, the activity measured, the instrument settings, and the initials of the individual who performed the check;

(2) For 41.2(17)“b”(2), the model and serial number of the dose calibrator, the model and serial number of each source used and the identity of the radionuclide contained in the source and its activity, the date of the test, the results of the test, the instrument settings, the identity of the individual performing the test, and the signature of the radiation safety officer;

(3) For 41.2(17)“b”(3), the model and serial number of the dose calibrator, the calculated activities, the measured activities, the date of the test, the identity of the individual performing the test, and the signature of the radiation safety officer; and

(4) For 41.2(17)“b”(4), the model and serial number of the dose calibrator, the configuration calibrated activity of the source measured, the activity of the source, the activity measured and the instrument setting for each volume measured, the date of the test, the identity of the individual performing the test, and the signature of the radiation safety officer.

41.2(18) Calibration and check of survey instruments.

a. A licensee shall ensure that the survey instruments used to show compliance with this rule have been calibrated before first use, annually, and following repair.

b. To satisfy the requirements of 41.2(18)“a,” the licensee shall:

(1) Calibrate all required scale readings up to 1000 millirems (10 mSv) per hour with a radiation source;

(2) For each scale that shall be calibrated, calibrate two readings separated by at least 50 percent of scale rating; and

(3) Conspicuously note on the instrument the apparent dose rate from a dedicated check source as determined at the time of calibration, and the date of calibration.

c. To satisfy the requirements of 41.2(18)“b,” the licensee shall consider a point as calibrated if the indicated exposure rate differs from the calculated exposure rate by not more than 20 percent and shall conspicuously attach a correction chart or graph to the instrument. A licensee may not use survey instruments if the difference between the indicated exposure rate and the calculated exposure rate is more than 20 percent.

d. A licensee shall check each survey instrument for proper operation with the dedicated check source before each use. The licensee is not required to keep records of these checks.

e. The licensee shall retain a record of each calibration required in 41.2(18)“*a*” for three years. The record shall include:

- (1) A description of the calibration procedure; and
- (2) A description of the source used and the certified dose rates from the source, the rates indicated by the instrument being calibrated, the correction factors deduced from the calibration data, the signature of the individual who performed the calibration, and the date of calibration.

f. To meet the requirements of 41.2(18)“*a*,” “*b*,” and “*c*,” the licensee may obtain the services of individuals licensed by the agency, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state to perform calibrations of survey instruments. Records of calibrations which contain information required by 41.2(18)“*e*” shall be maintained by the licensee.

g. Rescinded IAB 8/1/07, effective 9/5/07.

41.2(19) Assay of radiopharmaceutical dosages. A licensee shall:

a. Assay, prior to medical use, the activity of each radiopharmaceutical dosage that contains a photon-emitting radionuclide;

b. Measure, by direct measurement or by combination of measurements and calculations, the activity of each dosage of an alpha- or beta-emitting radionuclide prior to medical use, except for unit dosages obtained from a manufacturer or preparer licensed pursuant to 641—paragraph 39.4(29)“*j*” or equivalent NRC or agreement state requirements;

c. Not use a dosage if the dosage does not fall within the prescribed dosage range or if the dosage differs from the prescribed dosage by more than 20 percent unless otherwise directed by the authorized user; and

d. Retain a record of the assays required by 41.2(19)“*a*” for three years. To satisfy this requirement, the record shall contain the:

- (1) Generic name, trade name, or abbreviation of the radiopharmaceutical, its lot number, and expiration dates and the radionuclide;
- (2) Patient’s or human research subject’s name and identification number if one has been assigned;
- (3) Prescribed dosage and activity of the dosage at the time of assay, or a notation that the total activity is less than 30 microcuries (1.1 megabecquerels);
- (4) Date and time of the assay and administration; and
- (5) Initials of the individual who performed the assay.

41.2(20) Authorization for calibration and reference sources. Any person authorized by 41.2(3) for medical use of radioactive material may receive, possess, and use the following radioactive material for check, calibration and reference use:

a. Sealed sources manufactured and distributed by persons specifically licensed pursuant to 641—Chapter 39 or equivalent provisions of the U.S. Nuclear Regulatory Commission, agreement state or licensing state and that do not exceed 30 millicuries (1.11 GBq) each;

b. Any radioactive material listed in 41.2(31) or 41.2(33) with a half-life of 120 days or less in individual amounts not to exceed 15 millicuries (555 MBq);

c. Any radioactive material listed in 41.2(31) or 41.2(33) with a half-life greater than 120 days in individual amounts not to exceed 200 microcuries (7.4 MBq) each; and

d. Technetium-99m amounts as needed.

41.2(21) Requirements for possession of sealed sources and brachytherapy sources.

a. A licensee in possession of any sealed source or brachytherapy source shall follow the radiation safety and handling instructions supplied by the manufacturer or equivalent instructions approved by the agency and shall maintain the instructions for the duration of source use in a legible form convenient to users.

b. A licensee in possession of a sealed source shall ensure that:

- (1) The source is tested for leakage before its first use unless the licensee has a certificate from the supplier indicating that the source was tested within six months before transfer to the licensee; and

(2) The source is tested for leakage at intervals not to exceed six months or at intervals approved by the agency, another agreement state, a licensing state or the U.S. Nuclear Regulatory Commission.

c. To satisfy the leak test requirements of 41.2(21) “*b*,” the licensee shall ensure that:

(1) Leak tests are capable of detecting the presence of 0.005 microcurie (185 Bq) of radioactive material on the test sample or, in the case of radium, the escape of radon at the rate of 0.001 microcurie (37 Bq) per 24 hours;

(2) Test samples are taken from the source or from the surfaces of the device in which the source is mounted or stored on which radioactive contamination might be expected to accumulate; and

(3) Test samples are taken when the source is in the “off” position.

d. A licensee shall retain leak test records for five years. The records shall contain the model number, and serial number, if assigned, of each source tested, the identity of each source radionuclide and its estimated activity, the measured activity of each test sample expressed in microcuries (becquerels), a description of the method used to measure each test sample, the date of the test, the signature of the radiation safety officer and the signature of the individual performing the leak test.

e. If the leak test reveals the presence of 0.005 microcurie (185 Bq) or more of removable contamination, the licensee shall:

(1) Immediately withdraw the sealed source from use and store it in accordance with the requirements of these rules; and

(2) File a report with the agency within five days of receiving the leak test results. The report shall describe the equipment involved, the model and serial number of the leaking source, the radionuclide and its estimated activity, the test results, the date of the test, and the action taken.

f. A licensee need not perform a leak test on the following sources:

(1) Sources containing only radioactive material with a half-life of less than 30 days;

(2) Sources containing only radioactive material as a gas;

(3) Sources containing 100 microcuries (3.7 MBq) or less of beta or photon-emitting material or 10 microcuries (370 kBq) or less of alpha-emitting material; [and]

(4) Seeds of iridium-192 encased in nylon ribbon; and

(5) Sources stored and not being used. The licensee shall, however, test each such source for leakage before any use or transfer unless it has been tested for leakage within six months before the date of use or transfer.

g. A licensee in possession of a sealed source or brachytherapy source shall conduct a physical inventory of all such sources at 6-month intervals. The licensee shall retain each inventory record for five years. The inventory records shall contain the model number of each source, and serial number if one has been assigned, the identity of each source radionuclide and its estimated activity, the location of each source, date of the inventory, the signature of the radiation safety officer and the signature of the individual performing the physical inventory.

h. A licensee in possession of a sealed source or brachytherapy source shall survey with a radiation survey instrument at intervals not to exceed three months all areas where such sources are stored. This does not apply to teletherapy sources in teletherapy units or sealed sources in diagnostic devices.

i. A licensee shall retain a record of each survey required in 41.2(21) “*h*” for three years. The record shall include the date of the survey, a sketch of each area that was surveyed, the measured dose rate at several points in each area expressed in millirems (microsieverts) per hour, the model number and serial number of the survey instrument used to make the survey, and the signature of the radiation safety officer.

41.2(22) Syringe shields.

a. A licensee shall keep syringes that contain radioactive material to be administered in a radiation shield.

b. Unless otherwise approved by this agency, a licensee shall require each individual who prepares or administers radiopharmaceuticals to use a syringe radiation shield unless the use of the shield is contraindicated for that patient or human research subject.

41.2(23) Syringe labels. Unless utilized immediately, a licensee shall conspicuously label each syringe, or syringe radiation shield that contains a syringe with a radiopharmaceutical, with the

radiopharmaceutical name or its abbreviation, the type of diagnostic study or therapy procedure to be performed, or the patient's or human research subject's name.

41.2(24) Vial shields. A licensee shall require each individual preparing or handling a vial that contains a radiopharmaceutical to keep the vial in a vial radiation shield.

41.2(25) Vial shield labels. A licensee shall conspicuously label each vial radiation shield that contains a vial of a radiopharmaceutical with the radiopharmaceutical name or its abbreviation.

41.2(26) Surveys for contamination and ambient radiation dose rate.

a. A licensee shall survey with a radiation detection survey instrument at the end of each day of use all areas where radiopharmaceuticals are routinely prepared for use or administered.

b. A licensee shall survey with a radiation detection survey instrument at least once each week all areas where radiopharmaceuticals or radioactive wastes are stored.

c. A licensee shall conduct the surveys required by 41.2(26) "a" and "b" so as to be able to measure dose rates as low as 0.1 millirem (1 μ Sv) per hour.

d. A licensee shall establish dose rate action levels for the surveys required by 41.2(26) "a" and "b" and shall require that the individual performing the survey immediately notify the radiation safety officer if a dose rate exceeds an action level.

e. A licensee shall survey for removable contamination each day of use all areas where radiopharmaceuticals are routinely prepared for use or administered and each week where radioactive materials are stored.

f. A licensee shall conduct the surveys required by 41.2(26) "e" so as to be able to detect contamination on each wipe sample of 2000 disintegrations per minute (33.3 Bq).

g. A licensee shall establish removable contamination action levels for the surveys required by 41.2(26) "e" and shall require that the individual performing the survey immediately notify the radiation safety officer if contamination exceeds action levels.

h. A licensee shall retain a record of each survey required by 41.2(26) "a," "b," and "e" for two years. The record must include the date of the survey, a sketch of each area surveyed, action levels established for each area, the measured dose rate at several points in each area expressed in millirems (microsieverts) per hour or the removable contamination in each area expressed in disintegrations per minute (becquerels) per 100 square centimeters, the serial number and the model number of the instrument used to make the survey or analyze the samples, and the initials of the individual who performed the survey.

i. A licensee does not need to perform the surveys required in this subrule in an area where the patient or human research subject is confined and cannot be released under 41.2(27).

41.2(27) Release of patients or human research subjects containing radiopharmaceuticals or permanent implants.

a. The licensee may authorize the release from its control of any individual who has been administered unsealed radioactive materials or permanent implants containing radioactive material if the total effective dose equivalent to any other individual from exposure to the released individual is not likely to exceed 0.5 rem (5 mSv). (NUREG-1556, Vol. 9, "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Medical Licenses," describes methods for calculating doses to other individuals and contains tables of activities not likely to cause doses exceeding 0.5 rem (5 mSv).)

b. The licensee shall provide the released individual with instructions, including written instructions, on actions recommended to maintain doses to other individuals as low as is reasonably achievable if the total effective dose equivalent to any other individual is likely to exceed 0.1 rem (1 mSv). If the dose to a breast-feeding infant or child could exceed 0.1 rem (1 mSv) assuming there were no interruption of breast feeding, the instructions shall also include:

- (1) Guidance on the interruption or discontinuation of breast feeding, and
- (2) Information on the consequences of failure to follow the guidance.

c. The licensee shall maintain a record of the basis for authorizing the release of an individual, for three years after the date of release, if the total effective dose equivalent is calculated by:

- (1) Using the retained activity rather than the activity administered,

- (2) Using an occupancy factor less than 0.25 at 1 meter,
- (3) Using the biological or effective half-life, or
- (4) Considering the shielding by tissue.

d. The licensee shall maintain a record for three years after the date of release that instructions were provided to a breast-feeding woman if the radiation dose to the infant or child from continued breast feeding could result in a total effective dose equivalent exceeding 0.5 rem (5 mSv). IDPH Regulatory Guide, Release of Patients Administered Radioactive Materials describes methods for calculating doses to other individuals and contains tables of activities not likely to cause doses exceeding 0.5 rem (5 mSv).

41.2(28) *Mobile nuclear medicine service technical requirements.* A licensee providing mobile nuclear medicine service shall:

a. Transport to each address of use only syringes or vials containing prepared radiopharmaceuticals or radiopharmaceuticals that are intended for reconstitution of radiopharmaceutical kits;

b. Bring into each location of use all radioactive material to be used and, before leaving, remove all unused radioactive material and associated radioactive waste;

c. Secure or keep under constant surveillance and immediate control all radioactive material when in transit or at a location of use;

d. Check survey instruments and dose calibrators as required in 41.2(17) “*b*”(1) “*d*” and “*e*” and 41.2(18) “*d*” and check all other transported equipment for proper function before medical use at each location of use;

e. Carry a calibrated survey meter in each vehicle that is being used to transport radioactive material and, before leaving a client location of use, survey all areas of radiopharmaceutical use with a radiation detection survey instrument to ensure that all radiopharmaceuticals and all associated radioactive waste have been removed; and

f. Retain a record of each survey required by 41.2(28) “*e*” for three years. The record must include the date of the survey, a plan of each area that was surveyed, the measured dose rate at several points in each area of use expressed in millirems (microsieverts) per hour, the model and serial number of the instrument used to make the survey, and the initials of the individual who performed the survey.

41.2(29) *Storage of volatiles and gases.*

a. A licensee shall store volatile radiopharmaceuticals and radioactive gases in the shippers’ radiation shield and container.

b. A licensee shall store and use a multidose container in a properly functioning fume hood.

41.2(30) *Decay-in-storage.*

a. A licensee may hold radioactive material with a physical half-life of less than or equal to 120 days for decay-in-storage before disposal without regard to its radioactivity if the licensee:

(1) Holds radioactive material for decay a minimum of ten half-lives;

(2) Monitors radioactive material at the container surface before disposal as ordinary trash and determines that its radioactivity cannot be distinguished from the background radiation level with a radiation detection survey instrument set on its most sensitive scale and with no interposed shielding;

(3) Removes or obliterates all radiation labels; and

(4) Separates and monitors each generator column individually with all radiation shielding removed to ensure that its contents have decayed to background radiation level before disposal.

b. For radioactive material disposed in accordance with 41.2(30) “*a*,” the licensee shall retain a record of each disposal for three years. The record must include the date of the disposal, the date on which the radioactive material was placed in storage, the radionuclides disposed, the model and serial number of the survey instrument used, the background dose rate, the radiation dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

41.2(31) *Use of unsealed radioactive material for uptake, dilution, or excretion studies for which a written directive is not required.* Except for quantities that require a written directive under 41.2(87), a licensee may use for uptake, dilution, or excretion studies any unsealed radioactive material prepared for medical use that:

a. Is obtained from a manufacturer or preparer licensed pursuant to 641—paragraph 39.4(29) “j” or equivalent NRC or agreement state requirements or from a PET radioactive drug producer licensed pursuant to 641—paragraph 39.4(24) “h” or equivalent NRC or agreement state requirements; or

b. Excludes production of PET radionuclides, prepared by:

(1) An authorized nuclear pharmacist;

(2) A physician who is an authorized user and who meets the requirements specified in 41.2(68) or 41.2(69) and has work experience in eluting generator systems appropriate for preparation of radioactive drugs for imaging and localization studies, measuring and testing the eluate for radionuclidic purity, and processing the eluate with reagent kits to prepare labeled radioactive drugs; or

(3) An individual under the supervision, as specified in 41.2(11), of the authorized nuclear pharmacist in 41.2(31) “b”(1) or the physician who is an authorized user in 41.2(31) “b”(2); or

c. Is obtained from and prepared by an NRC or agreement state licensee for use in research in accordance with Radioactive Drug Research Committee-approved protocol or an Investigational New Drug (IND) protocol accepted by FDA; or

d. Is prepared by the licensee for use in research in accordance with a Radioactive Drug Research Committee-approved application or an Investigational New Drug (IND) protocol accepted by FDA.

41.2(32) Possession of survey instrument. A licensee authorized to use radioactive material for uptake, dilution, and excretion studies shall possess a portable radiation detection survey instrument capable of detecting dose rates over the range 0.1 millirem (1.0 μ Sv) per hour to 50 millirems (500 μ Sv) per hour. The instrument shall be operable and calibrated in accordance with 41.2(18).

41.2(33) Use of unsealed by-product material for imaging and localization studies for which a written directive is not required. Except for quantities that require a written directive under 41.2(87), a licensee may use for imaging and localization studies any unsealed by-product material prepared for medical use that:

a. Is obtained from a manufacturer or preparer licensed pursuant to 641—paragraph 39.4(29) “j” or equivalent NRC or agreement state requirements or a PET radioactive drug producer licensed pursuant to 641—paragraph 39.4(24) “h” or equivalent NRC or agreement state requirements; or

b. Excludes production of PET radionuclides, prepared by:

(1) An authorized nuclear pharmacist;

(2) A physician who is an authorized user and who meets the requirements specified in 41.2(68) or 41.2(69);

(3) An individual under the supervision, as specified in 41.2(11), of the authorized nuclear pharmacist in 41.2(33) “b”(1) or the physician who is an authorized user in 41.2(33) “b”(2); or

c. Is obtained from and prepared by an NRC or agreement state licensee for use in research in accordance with Radioactive Drug Research Committee-approved protocol or an Investigational New Drug (IND) protocol accepted by FDA; or

d. Is prepared by the licensee for use in research in accordance with a Radioactive Drug Research Committee-approved application or an Investigational New Drug (IND) protocol accepted by FDA.

41.2(34) Permissible molybdenum-99, strontium-82, and strontium-85 concentrations.

a. A licensee shall not administer to humans a radiopharmaceutical that contains:

(1) More than 0.15 microcurie of molybdenum-99 per millicurie of technetium-99m (0.15 kilobecquerel of molybdenum-99 per megabecquerel of technetium-99m); or

(2) More than 0.02 microcurie of strontium-82 per millicurie of rubidium-82 chloride injection (0.02 kilobecquerel strontium-82 per megabecquerel rubidium-82 chloride); or more than 0.2 microcurie of strontium-85 per millicurie of rubidium-82 chloride injection (0.2 kilobecquerel strontium-85 per megabecquerel rubidium-82 chloride).

b. A licensee preparing:

(1) Technetium-99m radiopharmaceuticals from molybdenum-99/technetium-99m generators shall measure the molybdenum-99 concentration in each eluate or extract; or

(2) Rubidium-82 radiopharmaceuticals from strontium-82/rubidium-82 generators shall measure the strontium-82 and strontium-85 concentration before the first patient use of the day.

c. A licensee who must measure molybdenum-99, strontium-82, or strontium-85 concentration shall retain a record of each measurement for three years. The record shall include:

(1) For each elution or extraction of technetium-99m, the ratio of the measures expressed as microcuries of molybdenum per millicurie of technetium (kilobecquerels of molybdenum per megabecquerel of technetium), the date of the test, and the initials of the individual who performed the test.

(2) For each elution or extraction of rubidium-82, the ratio of the measures expressed as microcuries of strontium-82 per millicurie of rubidium-82 (kilobecquerels of strontium-82 per megabecquerel of rubidium-82), microcuries of strontium-85 per millicurie of rubidium-82 (kilobecquerels of strontium-85 per millicurie of rubidium-82), the date of the test, and the initials of the individual who performed the test.

d. A licensee shall report immediately to the agency each occurrence of molybdenum-99 concentration exceeding the limits specified in 41.2(34)“a”(1) and strontium-82 or strontium-85 concentration exceeding the limits specified in 41.2(34)“a”(2).

41.2(35) Control of aerosols and gases.

a. A licensee who administers radioactive aerosols or gases shall do so with a system that will keep airborne concentrations within the limits prescribed by 641—40.15(136C) and 641—40.26(136C) of these rules.

b. The system shall either be directly vented to the atmosphere through an air exhaust or provide for collection and decay or disposal of the aerosol or gas in a shielded container.

c. A licensee shall only administer radioactive gases in rooms that are at negative pressure compared to surrounding rooms.

d. Before receiving, using, or storing a radioactive gas, the licensee shall calculate the amount of time needed after a release to reduce the concentration in the area of use to the occupational limit listed in Appendix B of 641—Chapter 40. The calculation shall be based on the highest activity of gas handled in a single container and the measured available air exhaust rate.

e. A licensee shall post the time calculated in 41.2(35)“a” at the area of use and require that, in case of a gas spill, individuals evacuate the room until the posted time has elapsed.

f. A licensee shall check the operation of collection systems monthly and measure the ventilation rates in areas of use at intervals not to exceed six months. Records of these checks and measurements shall be maintained for three years.

g. A copy of the calculations required in 41.2(35)“d” shall be recorded and retained for the duration of the license.

41.2(36) Possession of survey instruments. A licensee authorized to use radioactive material for imaging and localization studies shall possess a portable radiation detection survey instrument capable of detecting dose rates over the range of 0.1 millirem (1 μ Sv) per hour to 50 millirems (500 μ Sv) per hour, and a portable radiation measurement survey instrument capable of measuring dose rates over the range of 1 millirem (10 μ Sv) per hour to 1000 millirems (10 mSv) per hour. The instruments shall be operable and calibrated in accordance with 41.2(18).

41.2(37) Use of unsealed by-product material for which a written directive is required. A licensee may use any unsealed by-product material prepared for medical use and for which a written directive is required that:

a. Is obtained from:

(1) A manufacturer or preparer licensed under 641—paragraph 39.4(29)“j” or equivalent NRC or agreement state requirements; or

(2) A PET radioactive drug producer licensed under 641—paragraph 39.4(24)“h” or equivalent NRC or agreement state requirements; or

b. Excludes production of PET radionuclides, prepared by:

(1) An authorized nuclear pharmacist;

(2) A physician who is an authorized user and who meets the requirements of 41.2(68) or 41.2(69);

or

(3) An individual under the supervision, as specified in 41.2(11), of the authorized nuclear pharmacist in 41.2(37) “b”(1) or the physician who is an authorized user in 41.2(37) “b”(2); or

c. Is obtained from and prepared by an NRC or agreement state licensee for use in research in accordance with the Investigational New Drug (IND) protocol accepted by FDA; or

d. Is prepared by the licensee for use in research in accordance with an Investigational New Drug (IND) protocol accepted by FDA.

41.2(38) Safety instruction.

a. A licensee shall provide oral and written radiation safety instruction for all personnel caring for patients or human research subjects undergoing radiopharmaceutical therapy and hospitalized for compliance with 41.2(27). Refresher training shall be provided initially and at 12-month intervals or as required for patient care.

b. To satisfy 41.2(38) “a,” the instruction shall describe the licensee’s procedures for:

(1) Patient or human research subject control;

(2) Visitor control;

(3) Contamination control;

(4) Waste control;

(5) Notification of the radiation safety officer, radiation safety officer designee, or authorized user in case of the patient’s or human research subject’s death or medical emergency; and

(6) Training requirements specified in 641—40.110(136C) and 40.116(136C) and adopted by reference and included herein.

c. A licensee shall keep a record of individuals receiving instruction required by 41.2(38) “a,” a description of the instruction, the date of instruction, and the name of the individual who gave the instruction. Such record shall be maintained for inspection by the agency for three years.

41.2(39) Safety precautions.

a. For each patient or human research subject receiving radiopharmaceutical therapy and hospitalized for compliance with 41.2(27), a licensee shall:

(1) Provide a private room with a private sanitary facility or a room, with a private sanitary facility, with another individual who also has received therapy with unsealed radioactive material and who also cannot be released under 41.2(27);

(2) Post the patient’s or human research subject’s door with a “Caution: Radioactive Material” sign and note on the door or on the patient’s or human research subject’s chart where and how long visitors may stay in the patient’s or human research subject’s room;

(3) Authorize visits by individuals under 18 years of age only on a case-by-case basis with the approval of the authorized user after consultation with the radiation safety officer;

(4) Promptly after administration of the dosage, measure the dose rates in contiguous restricted and unrestricted areas with a radiation measurement survey instrument to demonstrate compliance with the requirements of 641—subrule 40.26(1) which is adopted by reference and included herein and retain for three years a record of each survey that includes the time and date of the survey, a plan of the area or list of points surveyed, the measured dose rate at several points expressed in millirems (μSv) per hour, the instrument used to make the survey, and the initials of the individual who made the survey;

(5) Either monitor material and items removed from the patient’s or human research subject’s room to determine that any contamination cannot be distinguished from the natural background radiation level with a radiation detection survey instrument set on its most sensitive scale and with no interposed shielding, or handle these materials and items as radioactive waste;

(6) Provide the patient or human research subject with radiation safety guidance that will help to keep radiation dose to household members and the public as low as reasonably achievable before authorizing release of the patient or human research subject;

(7) Survey the patient’s or human research subject’s room and private sanitary facility for removable contamination with a radiation detection survey instrument before assigning another patient or human research subject to the room. The room must not be reassigned until removable contamination is less than 200 disintegrations per minute (3.33 Bq) per 100 square centimeters; and

b. A licensee shall notify the radiation safety officer or the authorized user immediately if the patient or human research subject dies or has a medical emergency.

41.2(40) Possession of survey instruments. A licensee authorized to use radioactive material for radiopharmaceutical therapy shall possess a portable radiation detection survey instrument capable of detecting dose rates over the range of 0.1 millirem (1 μ Sv) per hour to 50 millirems (500 μ Sv) per hour, and a portable radiation measurement survey instrument capable of measuring dose rates over the range of 1 millirem (10 μ Sv) per hour to 1000 millirems (10 mSv) per hour. The instruments shall be operable and calibrated in accordance with 41.2(18).

41.2(41) Use of sealed sources for diagnosis. A licensee shall use only sealed sources for diagnostic medical uses as approved in the Sealed Source and Device Registry.

41.2(42) Availability of survey instrument. A licensee authorized to use radioactive material as a sealed source for diagnostic purposes shall have available for use a portable radiation detection survey instrument capable of detecting dose rates over the range of 0.1 millirem (1 μ Sv) per hour to 50 millirems (500 μ Sv) per hour or a portable radiation measurement survey instrument capable of measuring dose rates over the range of 1 millirem (10 μ Sv) per hour to 1000 millirems (10 mSv) per hour. The instrument shall be operable and calibrated in accordance with 41.2(18).

41.2(43) Use of sources for brachytherapy. A licensee shall use only brachytherapy sources for therapeutic medical uses:

- a. As approved in the Sealed Source and Device Registry; or
- b. In research in accordance with an active Investigational Device Exemption (IDE) application accepted by the FDA provided the requirements of 41.2(15) are met.

41.2(44) Safety instruction.

a. The licensee shall provide oral and written radiation safety instruction to all personnel caring for a patient or human research subject receiving implant therapy. Refresher training shall be provided initially and at 12-month intervals or as required for patient care.

b. To satisfy 41.2(44) "a," the instruction shall describe:

- (1) Size and appearance of the brachytherapy sources;
- (2) Safe handling and shielding instructions in case of a dislodged source;
- (3) Procedures for patient or human research subject control;
- (4) Procedures for visitor control, to include routine visitation of hospitalized individuals in accordance with 641—40.26(136C) and visitation authorized in accordance with 641—40.26(136C);
- (5) Procedures for notification of the radiation safety officer, radiation safety officer designee, or authorized user if the patient or human research subject dies or has a medical emergency; and
- (6) Training requirements specified in 641—40.110(136C) and 40.116(136C) as adopted by reference and included herein.

c. A licensee shall maintain a record of individuals receiving instruction required by 41.2(44) "a," a description of the instruction, the date of instruction, and the name of the individual who gave the instruction for three years.

41.2(45) Safety precautions.

a. For each patient or human research subject receiving implant therapy a licensee shall:

- (1) Not place the patient or human research subject in the same room with a patient who is not receiving radiation therapy unless the licensee can demonstrate compliance with the requirement of 641—40.26(136C) as adopted by reference and included herein at a distance of 1 meter from the implant;
- (2) Post the patient's or human research subject's door with a "Caution: Radioactive Materials" sign and note on the door or the patient's or human research subject's chart where and how long visitors may stay in the patient's or human research subject's room;
- (3) Authorize visits by individuals under 18 years of age only on a case-by-case basis with the approval of the authorized user after consultation with the radiation safety officer;
- (4) Promptly after implanting the sources, survey the dose rates in contiguous restricted and unrestricted areas with a radiation measurement survey instrument to demonstrate compliance with 641—40.26(136C) as adopted by reference and included herein; and retain for three years a record of each survey that includes the time and date of the survey, a sketch of the area or list of points surveyed,

the measured dose rate at several points expressed in millirems (mSv) per hour, the instrument used to make the survey, and the initials of the individual who made the survey;

(5) Provide the patient or human research subject with radiation safety guidance that will help keep the radiation dose to household members and the public as low as reasonably achievable before releasing the patient or human research subject if the patient or human research subject was administered a permanent implant; and

(6) Have applicable emergency response equipment available near each treatment room to respond to a source dislodged from the patient or lodged within the patient following removal of the source applicators.

b. A licensee shall notify the radiation safety officer, radiation safety officer designee, or authorized user immediately if the patient or human research subject dies or has a medical emergency.

41.2(46) Brachytherapy sources inventory.

a. Each time brachytherapy sources are returned to an area of storage from an area of use, the licensee shall immediately count or otherwise verify the number returned to ensure that all sources taken from the storage area have been returned.

b. A licensee shall make a record of brachytherapy source utilization which includes:

(1) The names of the individuals permitted to handle the sources;

(2) The number and activity of sources removed from storage, the room number of use and patient's or human research subject's name, the time and date they were removed from storage, the number and activity of sources in storage after the removal, and the initials of the individual who removed the sources from storage; and

(3) The number and activity of sources returned to storage, the room number of use and patient's or human research subject's name, the time and date they were returned to storage, the number and activity of sources in storage after the return, and the initials of the individual who returned the sources to storage.

c. Immediately after implanting sources in a patient or human research subject and immediately after removal of sources from a patient or human research subject, the licensee shall make a radiation survey of the patient or human research subject and the area of use to confirm that no sources have been misplaced. The licensee shall make a record of each survey.

d. A licensee shall maintain the records required in 41.2(46) "b" and "c" for three years.

e. A licensee shall maintain accountability at all times for all brachytherapy sources in storage or use. As soon as possible after removing sources from a patient or a human research subject, a licensee shall return brachytherapy sources to a secure storage area.

41.2(47) Release of patients or human research subjects treated with temporary implants.

a. Immediately after removing the last temporary implant source from a patient or human research subject, the licensee shall perform a radiation survey of the patient or human research subject with a radiation detection survey instrument to confirm that all sources have been removed and, for remote afterloaders, returned to the safe shielded position. The licensee shall not release from confinement for medical care a patient or human research subject treated by temporary implant until all sources have been removed.

b. A licensee shall maintain a record of patient or human research subject surveys which demonstrate compliance with 41.2(47) "a" for three years. Each record shall include the date of the survey, the name of the patient or human research subject, the dose rate from the patient or human research subject expressed as millirems (microsieverts) per hour and measured within 1 meter from the patient or human research subject, and the initials of the individual who made the survey.

41.2(48) Possession of survey instruments. A licensee authorized to use radioactive material for implant therapy shall possess a portable radiation detection survey instrument capable of detecting dose rates over the range of 0.1 millirem (1 μ Sv) per hour to 50 millirems (500 μ Sv) per hour, and a portable radiation measurement survey instrument capable of measuring dose rates over the range of 1 millirem (10 μ Sv) per hour to 1000 millirems (10 mSv) per hour. The instruments shall be operable and calibrated in accordance with 41.2(18).

41.2(49) Use of a sealed source in a remote afterloader unit, teletherapy unit, or gamma stereotactic radiosurgery unit. A licensee shall use sealed sources in photon emitting remote afterloader units,

teletherapy units, or gamma stereotactic radiosurgery units for therapeutic medical uses as approved in the Sealed Source and Device Registry or in research in accordance with an active Investigational Device Exemption (IDE) application accepted by the FDA provided the requirements of 41.2(15) are met.

41.2(50) *Installation, maintenance, adjustment, and repair.*

a. Only a person specifically licensed by the NRC or an agreement state shall install, maintain, adjust, or repair a remote afterloader unit, teletherapy unit, or gamma stereotactic radiosurgery unit that involves work on the source shielding, the source(s) driving unit, or other electronic or mechanical component that could expose the source(s), or reduce the shielding around the source(s), or compromise the radiation safety of the unit or the source(s).

b. Except for low-dose-rate remote afterloader units, only a person specifically licensed by the NRC or an agreement state shall install, replace, relocate, or remove a sealed source or source contained in other remote afterloader units, teletherapy units, or gamma stereotactic radiosurgery units.

c. For low-dose-rate remote afterloader units, only a person specifically licensed by the NRC or an agreement state or an authorized medical physicist shall install, replace, relocate, or remove a sealed source(s) contained in the unit.

d. A licensee shall retain a record of the installation, maintenance, adjustment, and repair of remote afterloader units, teletherapy units and gamma stereotactic radiosurgery units for three years. The record must include the date, description of the service, and the name of the individual who performed the work.

41.2(51) *Amendments.* In addition to the requirements specified in 41.2(4), a licensee shall apply for and receive a license amendment before:

- a.* Making any change in the treatment room shielding;
- b.* Making any change in the location of the teletherapy unit within the treatment room;
- c.* Using the teletherapy unit in a manner that could result in increased radiation levels in areas outside the teletherapy treatment room;
- d.* Relocating the teletherapy unit; or
- e.* Allowing an individual not listed on the licensee's license to perform the duties of the teletherapy physicist.

41.2(52) *Safety procedures and instructions for remote afterloader units, teletherapy units, and gamma stereotactic radiosurgery units.*

- a.* A licensee shall:
 - (1) Secure the unit, the console, the console keys, and the treatment room when not in use or unattended;
 - (2) Permit only individuals approved by the authorized user, radiation safety officer, or authorized medical physicist to be present in the treatment room during treatment with the source;
 - (3) Prevent dual operation of more than one radiation producing device in a treatment room, if applicable; and
 - (4) Develop, implement, and maintain written procedures for responding to an abnormal situation when the operator is unable to place the source in the shielded position, or to remove the patient or human research subject from the radiation field with controls from outside the treatment room. These procedures must include:
 1. Instructions for responding to equipment failures and the names of the individuals responsible for implementing corrective actions;
 2. The process for restricting access to and posting of the treatment area to minimize the risk of inadvertent exposure; and
 3. The names and telephone numbers of the authorized users, the authorized medical physicist, and the radiation safety officer to be contacted if the unit or console operates abnormally.
- b.* A copy of the procedures required by 41.2(52) "a"(4) must be physically located at the unit console.
- c.* A licensee shall post instructions at the unit console to inform the operator of:
 - (1) The location of the procedures required by 41.2(52) "a"(4); and

(2) The names and telephone numbers of the authorized users, the authorized medical physicist, and the radiation safety officer to be contacted if the unit or console operates abnormally.

d. A licensee shall provide instruction, initially and at least annually, to all individuals who operate the unit, appropriate to the individual's assigned duties, in:

- (1) The procedures identified in 41.2(52)“a”(4); and
- (2) The operating procedures for the unit.

e. The licensee shall ensure that operators, authorized medical physicists, and authorized users participate in drills of emergency procedures, initially and at least annually.

f. A licensee shall retain a record for three years of individuals receiving instruction required by 41.2(52)“d,” a description of the instruction, the date of instruction, and the name of the individual who gave the instruction. A copy of the procedures required in 41.2(52)“a”(4) and 41.2(52)“d”(2) shall be retained for three years.

41.2(53) *Safety precautions for remote afterloader units, teletherapy units, and gamma stereotactic radiosurgery units.*

a. A licensee shall control access to the teletherapy room by a door at each entrance.

b. A licensee shall equip each entrance to the teletherapy room with an electrical interlock system that shall:

(1) Prevent the operator from turning the primary beam of radiation “on” unless each treatment room entrance door is closed;

(2) Turn the beam of radiation “off” immediately when an entrance door is opened; and

(3) Prevent the primary beam of radiation from being turned “on” following an interlock interruption until all treatment room entrance doors are closed and the beam “on-off” control is reset at the console.

c. A licensee shall require any individual entering the treatment room to ensure, through the use of appropriate monitors, that radiation levels have returned to ambient levels.

d. Except for low-dose-rate remote afterloader units, a licensee shall construct or equip each treatment room with viewing and intercom systems to permit continuous observation of the patient or human research subject from the treatment console during irradiation.

e. For licensed activities where sources are placed within the patient's or human research subject's body, the licensee shall only conduct treatments which allow for expeditious removal of a decoupled or jammed source.

f. In addition to the requirements specified in 41.2(53)“a” through “e,” a licensee shall:

(1) For medium-dose-rate and pulsed-dose-rate remote afterloader units, require:

1. An authorized medical physicist and either an authorized user or a physician, under the supervision of an authorized user, who have been trained in the operation of and emergency response for the unit to be physically present during the initiation of all patient treatments involving the unit; and

2. An authorized medical physicist and either an authorized user or an individual, under the supervision of an authorized user, who have been trained to remove the source applicator in the event of an emergency involving the unit to be immediately available during continuation of all patient treatments involving the unit.

(2) For high-dose-rate remote afterloader units, require:

1. An authorized user and an authorized medical physicist to be physically present during the initiation of all patient treatments involving the unit; and

2. An authorized medical physicist and either an authorized user or a physician, under the supervision of an authorized user, who have been trained in the operation and emergency response for the unit, to be physically present during the continuation of all patient treatments involving the unit.

(3) For gamma stereotactic radiosurgery units, require an authorized user and an authorized medical physicist to be physically present throughout all patient treatments involving the unit. As used in this subparagraph, “physically present” means to be within hearing distance of normal voice.

(4) Notify the radiation safety officer, or the radiation safety officer designee, and an authorized user as soon as possible if the patient or human research subject has a medical emergency or dies.

g. A licensee shall have applicable emergency response equipment available near each treatment room to respond to a source remaining in the unshielded position or lodged within the patient following completion of the treatment.

41.2(54) Possession of survey instrument. A licensee authorized to use radioactive material in a teletherapy unit shall possess either a portable radiation detection survey instrument capable of detecting dose rates over the range of 0.1 millirem ($1 \mu\text{Sv}$) per hour to 50 millirems ($500 \mu\text{Sv}$) per hour or a portable radiation measurement survey instrument capable of measuring dose rates over the range of 1 millirem ($10 \mu\text{Sv}$) per hour to 1000 millirems (10 mSv) per hour. The instruments shall be operable and calibrated in accordance with 41.2(18).

41.2(55) Radiation monitoring device.

a. A licensee shall have in each teletherapy room a permanent radiation monitor capable of continuously monitoring beam status.

b. Each radiation monitor shall be capable of providing visible notice of a teletherapy unit malfunction that results in an exposed or partially exposed source. The visible indicator of high radiation levels shall be observable by an individual entering the teletherapy room.

c. Each radiation monitor shall be equipped with a backup power supply separate from the power supply to the teletherapy unit. This backup power supply may be a battery system.

d. A radiation monitor shall be checked with a dedicated check source for proper operation each day before the teletherapy unit is used for treatment of patients or human research subjects.

e. A licensee shall maintain a record of the check required by 41.2(55)“d” for three years. The record shall include the date of the check, notation that the monitor indicates when the source is exposed, and the initials of the individual who performed the check.

f. If a radiation monitor is inoperable, the licensee shall require any individual entering the teletherapy room to use a survey instrument or audible alarm personal dosimeter to monitor for any malfunction of the source exposure mechanism. The instrument or dosimeter shall be checked with a dedicated check source for proper operation at the beginning of each day of use. The licensee shall keep a record as described in 41.2(55)“e.”

g. A licensee shall promptly repair or replace the radiation monitor if it is inoperable.

41.2(56) Viewing system. A licensee shall construct or equip each teletherapy room to permit continuous observation of the patient or human research subject from the teletherapy unit console during irradiation.

41.2(57) Dosimetry equipment.

a. Except for low-dose-rate remote afterloader sources where the source output or activity is determined by the manufacturer, a licensee shall have a calibrated dosimetry system available for use. To satisfy this requirement, one of the following two conditions shall be met:

(1) The system must have been calibrated using a system or source traceable to the National Institute of Standards and Technology and published protocols accepted by nationally recognized bodies, or by a calibration laboratory accredited by the American Association of Physicists in Medicine. The calibration must have been performed within the previous two years and after any servicing that may have affected system calibration; or

(2) The system must have been calibrated within the previous four years; 18 to 30 months after that calibration, the system must have been intercompared with another dosimetry system that was calibrated within the past 24 months by the National Institute of Standards and Technology or by a calibration laboratory accredited by the American Association of Physicists in Medicine. The results of the intercomparison must indicate that the calibration factor of the licensee’s system has not changed by more than 2 percent. The licensee may not use the intercomparison result to change the calibration factor. When intercomparing dosimetry systems to be used for calibrating sealed sources for therapeutic units, the licensee shall use a comparable unit with beam attenuators or collimators, if applicable, and sources of the same radionuclide as the source used at the licensee’s facility.

b. The licensee shall have available for use a dosimetry system for spot-check measurements. To meet this requirement, the system may be compared with a system that has been calibrated in accordance with 41.2(57)“a.” This comparison must have been performed within the previous year and after each

servicing that may have affected system calibration. The spot-check system may be the same system used to meet the requirement in 41.2(57)“a.”

c. The licensee shall maintain a record of each calibration, intercomparison, and comparison for the duration of the license. For each calibration, intercomparison, or comparison, the record shall include the date, the model numbers and serial numbers of the instruments that were calibrated, intercompared, or compared as required by 41.2(57)“a” and “b,” the correction factors that were determined, the names of the individuals who performed the calibration, intercomparison, or comparison, and evidence that the intercomparison meeting was sanctioned by a calibration laboratory or radiologic physics center accredited by the American Association of Physicists in Medicine.

41.2(58) *Full calibration measurements on teletherapy units, remote afterloader units, and gamma stereotactic radiosurgery units.*

a. *Teletherapy units.*

(1) A licensee authorized to use a teletherapy unit for medical use shall perform full calibration measurements for each teletherapy unit:

1. Before the first medical use of the unit; and

2. Before medical use under the following conditions:

- Whenever spot-check measurements indicate that the output differs by more than 5 percent from the output of the last full calibration corrected mathematically for radioactive decay;

- Following replacement of the source or following reinstallation of the teletherapy unit in a new location;

- Following any repair of the teletherapy unit that includes removal of the source or major repair of the components associated with the source exposure assembly; and

3. At intervals not exceeding one year.

(2) To satisfy the requirements of 41.2(58)“a”(1), full calibration measurements must include determination of:

1. The output within ± 3 percent for the range of field sizes and for the distance or range of distances used for medical use;

2. The coincidence of the radiation field and the field indicated by the light beam localizing device;

3. The uniformity of the radiation field and its dependence on the orientation of the useful beam;

4. Timer accuracy and linearity over the range of use;

5. On-off error; and

6. The accuracy of all distance measuring and localization devices in medical use.

(3) A licensee shall use the dosimetry system described in 41.2(57) to measure the output for one set of exposure conditions. The remaining radiation measurements required in 41.2(58)“a”(2)“1” may be made using the dosimetry system that indicates relative dose rates.

(4) A licensee shall make full calibration measurements required by 41.2(58)“a” in accordance with published protocols accepted by nationally recognized bodies.

(5) A licensee shall mathematically correct the outputs determined in 41.2(58)“a”(2)“1” for physical decay for intervals not exceeding one month for cobalt-60, six months for cesium-137, or at intervals consistent with 1 percent of all other radionuclides.

(6) Full calibration measurements required by 41.2(58)“a”(1) and physical decay corrections required in 41.2(58)“a”(5) must be performed by the authorized medical physicist.

(7) A licensee shall maintain a record of each calibration for the duration of the license. The record shall include the date of the calibration; the manufacturer’s name, model number, and serial number for both the unit and the source; tables that describe the output of the unit over the range of field sizes and for the range of distances used in radiation therapy; a determination of the coincidence of the radiation field and the field indicated by the light beam localizing device; the measured timer accuracy for a typical treatment time; the calculated “on-off” error; the estimated accuracy of each distance measuring or localization device; and the signature of the authorized medical physicist.

b. *Remote afterloader units.*

(1) A licensee authorized to use a remote afterloader unit for medical use shall perform full calibration measurements for each unit:

1. Before the first medical use of the unit; and
 2. Before medical use under the following conditions:
 - Following replacement of the source or following reinstallation of the unit in a new location outside the facility; and
 - Following any repair of the unit that includes removal of the source or major repair of the components associated with the source exposure assembly; and
 3. At intervals not exceeding one quarter of a year for high-dose-rate, medium-dose-rate, and pulsed-dose-rate remote afterloader units with sources whose half-life exceeds 75 days; and
 4. At intervals not exceeding one year for low-dose-rate remote afterloader units.
- (2) To satisfy the requirements of 41.2(58) "b"(1), full calibration measurements must include, as applicable, determination of:
1. The output within ± 5 percent;
 2. Source positioning accuracy to within ± 1 millimeter;
 3. Source retraction with backup battery upon power failure;
 4. Length of the source transfer tubes;
 5. Timer accuracy and linearity over the typical range of use;
 6. Length of the applicators; and
 7. Function of the source transfer tubes, applicators, and transfer tube-applicator interfaces.
- (3) A licensee shall use the dosimetry system described in 41.2(57) to measure the output.
- (4) A licensee shall make full calibration measurements required by 41.2(58) "b"(1) in accordance with published protocols accepted by nationally recognized bodies.
- (5) In addition to the requirements for full calibrations for low-dose-rate remote afterloader units in 41.2(58) "b"(2), a licensee shall perform an autoradiograph of the source to verify inventory and source arrangement at intervals not exceeding one quarter of a year.
- (6) For low-dose-rate remote afterloader units, a licensee may use measurements provided by the source manufacturer that are made in accordance with 41.2(58) "b."
- (7) A licensee shall mathematically correct the outputs determined in 41.2(58) "b"(2) "1" for physical decay intervals consistent with 1 percent physical decay.
- (8) Full calibration measurements required by 41.2(58) "b"(1) and physical decay corrections required by 41.2(58) "b"(7) must be performed by the authorized medical physicist.
- (9) A licensee shall retain a record of each calibration in accordance with 41.2(58) "a"(7).
- c. Gamma stereotactic radiosurgery units.*
- (1) A licensee authorized to use a gamma stereotactic radiosurgery unit for medical use shall perform full calibration measurements on each unit:
 1. Before the first medical use of the unit;
 2. Before medical use under the following conditions:
 - Whenever spot-check measurements indicate that the output differs by more than 5 percent from the output obtained at the last full calibration corrected mathematically for radioactive decay;
 - Following replacement of the sources or following reinstallation of the gamma stereotactic radiosurgery unit in a new location; and
 - Following any repair of the gamma stereotactic radiosurgery unit that includes removal of the sources or major repair of the components associated with the source assembly; and
 3. At intervals not exceeding one year, with the exception that relative helmet factors need only be determined before the first medical use of a helmet and following any damage to a helmet.
 - (2) To satisfy the requirement of 41.2(58) "c"(1), full calibration measurements must include determination of:
 1. The output within ± 3 percent;
 2. Relative helmet factors;
 3. Isocenter coincidence;
 4. Timer accuracy and linearity over the range of use;
 5. On-off error;
 6. Trunnion centricity;

7. Treatment table retraction mechanism, using backup battery power or hydraulic backups with the unit off;

8. Helmet microswitches;

9. Emergency timing circuits; and

10. Stereotactic frames and localizing devices (trunnions).

(3) A licensee shall use the dosimetry system described in 41.2(57) to measure the output for one set of exposure conditions. The remaining radiation measurements required in 41.2(58) "c"(2)"1" may be made using a dosimetry system that indicates relative dose rates.

(4) A licensee shall make full calibration measurements required by 41.2(58) "c"(1) in accordance with published protocols accepted by nationally recognized bodies.

(5) A licensee shall mathematically correct the outputs determined in 41.2(58) "c"(2)"1" at intervals not exceeding one month for cobalt-60 and at intervals consistent with 1 percent physical decay for all other radionuclides.

(6) Full calibration measurements required by 41.2(58) "c"(1) and physical decay corrections required in 41.2(58) "c"(5) must be performed by the authorized medical physicist.

(7) A licensee shall retain a record of each calibration in accordance with 41.2(58) "a"(7).

41.2(59) Periodic spot checks for teletherapy units, remote afterloader units, and gamma stereotactic radiosurgery units.

a. Teletherapy units.

(1) A licensee authorized to use teletherapy units for medical use shall perform output spot checks on each teletherapy unit once in each calendar month that include determination of:

1. Timer accuracy and timer linearity over the range of use;

2. On-off error;

3. The coincidence of the radiation field and the field indicated by the light beam localizing device;

4. The accuracy of all distance measuring and localization devices used for medical use;

5. The output for one typical set of operating conditions measured with the dosimetry system described in 41.2(57); and

6. The difference between the measurement made in 41.2(59) "a"(1)"5" and the anticipated output expressed as a percentage of the anticipated output (i.e., the value obtained at last full calibration corrected mathematically for physical decay).

(2) A licensee shall perform measurements required by 41.2(59) "a"(1) in accordance with written procedures established by the authorized medical physicist. That individual need not actually perform the spot-check measurements.

(3) A licensee shall have the authorized medical physicist review the results of each spot check within 15 days. The authorized medical physicist shall notify the licensee as soon as possible in writing of the result of each spot check.

(4) A licensee authorized to use a teletherapy unit for medical use shall perform safety spot checks of each teletherapy facility once in each calendar month and after each source installation to ensure proper operation of:

1. Electrical interlocks at each teletherapy room entrance;

2. Electrical or mechanical stops installed for the purpose of limiting use of the primary beam of radiation (restriction of source housing angulation or elevation, carriage or stand travel and operation of the beam on-off mechanism);

3. Source exposure indicator lights on the teletherapy unit, on the control console, and in the facility;

4. Viewing and intercom systems;

5. Treatment room doors from inside and outside the treatment room; and

6. Electrically assisted treatment room doors with the teletherapy unit electrical power turned off.

(5) If the results of the spot checks required in 41.2(59) "a"(4) indicate the malfunction of any system, the licensee shall lock the control console in the off position and not use the unit except as may be necessary to repair, replace, or check the malfunctioning system.

(6) A licensee shall retain for three years a record of each spot check required in 41.2(59) "a." The record must include:

1. The date of the spot check;
2. The manufacturer's name, model number, and serial number of the teletherapy unit, source and instrument used to measure the output of the teletherapy unit;
3. An assessment of timer linearity and constancy;
4. The calculated on-off error;
5. A determination of the coincidence of the radiation field and the field indicated by the light beam localizing device;
6. The determined accuracy of each distance measuring and localization device;
7. The difference between the anticipated output and the measured output;
8. Notations indicating the operability of each entrance door electrical interlock, each electrical or mechanical source exposure indicator light, and the viewing and intercom system and doors; and
9. The name of the individual who performed the periodic spot check and the signature of the authorized medical physicist who reviewed the record of the spot check.

(7) A licensee shall retain a copy of the procedures required by 41.2(59) "a"(2) until the licensee no longer possesses the teletherapy unit.

b. Remote afterloader units.

(1) A licensee authorized to use a remote afterloader unit for medical use shall perform spot checks of each remote afterloader facility and on each unit:

1. Before the first use of a high-dose-rate, medium-dose-rate, or pulsed-dose-rate remote afterloader unit on a given day;
2. Before each patient treatment with a low-dose-rate remote afterloader unit; and
3. After each source installation.

(2) A licensee shall perform the measurements required by 41.2(59) "b"(1) in accordance with written procedures established by the authorized medical physicist. That individual need not actually perform the spot-check measurements.

(3) A licensee shall have the authorized medical physicist review the results of each spot check within 15 days. The authorized medical physicist shall notify the licensee as soon as possible in writing of the results of each spot check.

(4) To satisfy the requirements of 41.2(59) "b"(1), spot checks must, at a minimum, ensure proper operation of:

1. Electrical interlocks at each remote afterloader unit room entrance;
2. Source exposure indicator lights on the remote afterloader unit, on the control console, and in the facility;
3. Viewing and intercom systems in each high-dose-rate, medium-dose-rate, and pulsed-dose-rate remote afterloader facility;
4. Emergency response equipment;
5. Radiation monitors used to indicate the source position;
6. Timer accuracy;
7. Clock (date and time) in the unit's computer; and
8. Decayed source(s) activity in the unit's computer.

(5) If the results of the spot checks required in 41.2(59) "b"(4) indicate the malfunction of any system, the licensee shall lock the control console in the off position and not use the unit except as may be necessary to repair, replace, or spot check the malfunctioning system.

(6) A licensee shall retain for three years a record of each spot check required in 41.2(59) "b"(4). The record must include:

1. The date of the spot check;
2. The manufacturer's name, model number, and serial number for the remote afterloader unit and source;
3. An assessment of timer accuracy;

4. Notations indicating the operability of each entrance door electrical interlock, radiation monitors, source exposure indicator lights, viewing and intercom systems, and clock and decayed source activity in the unit's computer; and

5. The name of the individual who performed the periodic spot check and the signature of the authorized medical physicist who reviewed the record of the spot check.

(7) A licensee shall retain a copy of the procedures required in 41.2(59) "b"(2) until the licensee no longer possesses the remote afterloader unit.

c. Gamma stereotactic radiosurgery units.

(1) A licensee authorized to use a gamma stereotactic radiosurgery unit for medical use shall perform spot checks for the gamma stereotactic radiosurgery facility and on each unit:

1. Monthly;
2. Before the first use of the unit on a given day; and
3. After each source installation.

(2) A licensee shall:

1. Perform the measurements required by 41.2(59) "c"(1) in accordance with written procedures established by the authorized medical physicist. That individual need not actually perform the spot-check measurements.

2. Have the authorized medical physicist review the results of each spot check within 15 days. The authorized medical physicist shall notify the licensee as soon as possible in writing of the results of each spot check.

(3) To satisfy the requirements of 41.2(59) "c"(1) "1," spot checks must, at a minimum:

1. Ensure proper operation of treatment table retraction mechanism, using backup battery power or hydraulic backups with the unit off; helmet microswitches; emergency timing circuits; and stereotactic frames and localizing devices (trunnions).

2. Determine:

- The output for one typical set of operating conditions measured with the dosimetry system described in 41.2(57);

- The difference between the measurement made in the above bulleted point and the anticipated output expressed as a percentage of the anticipated output (i.e., the value obtained at last full calibration corrected mathematically for physical decay);

- Source output against computer calculation;
- Timer accuracy and linearity over the range of use;
- On-off error; and
- Trunnion centricity.

(4) To satisfy the requirements of 41.2(59) "c"(1) "2" and "3," spot checks must ensure proper functioning of:

1. Electrical interlocks at each gamma stereotactic radiosurgery room entrance;
2. Source exposure indicator lights on the gamma stereotactic radiosurgery unit, on the control console, and in the facility;
3. Viewing and intercom systems;
4. Timer termination;
5. Radiation monitors used to indicate room exposures; and
6. Emergency off buttons.

(5) A licensee shall arrange as soon as possible for the repair of any system identified in 41.2(59) "c"(3) that is not operating properly.

(6) If the results of the spot checks required in 41.2(59) "c"(4) indicate the malfunction of any system, the licensee shall lock the control console in the off position and not use the unit except as may be necessary to repair, replace, or check the malfunctioning system.

(7) A licensee shall retain for three years a record of each spot check required by 41.2(59) "c"(3) and (4). The record must include:

1. The date of the spot check;

2. The manufacturer's name, model number, and serial number for the gamma stereotactic radiosurgery unit and the survey instrument used to measure the output of the unit;
3. An assessment of timer linearity and accuracy;
4. The calculated on-off error;
5. A determination of trunnion centricity;
6. The difference between the anticipated output and the measured output;
7. An assessment of source output against computer calculations;
8. Notations indicating the operability of radiation monitors, helmet microswitches, emergency timing circuits, on-off buttons, electrical interlocks, source exposure indicator lights, viewing and intercom systems, timer termination, treatment table retraction mechanism, and stereotactic frames and localizing devices (trunnions); and
9. The name of the individual who performed the periodic spot check and the signature of the authorized medical physicist who reviewed the record of the spot check.

(8) A licensee shall retain a copy of the procedures required in 41.2(59) "c"(2) until the licensee no longer possesses the gamma stereotactic radiosurgery unit.

41.2(60) Radiation surveys for teletherapy facilities.

a. In addition to the survey requirements in 641—40.36(136C), a person licensed under 641—41.2(136C) shall make surveys to ensure that the maximum radiation levels and average radiation levels from the surface of the main source safe with the source in the shielded position do not exceed the levels stated in the Sealed Source and Device Registry.

b. The licensee shall make the survey required in 41.2(60) "a" at installation of a new source, and following repairs to the source shielding, the source driving unit, or other electronic or mechanical component that could expose the source, reduce the shielding around the source, or compromise the radiation safety of the source.

c. A licensee shall maintain a record of the radiation measurements made following installation of a source for the duration of the license. The record shall include the date of the measurements, the reason the survey is required, the manufacturer's name, model number and serial number of the teletherapy unit, the source, and the instrument used to measure radiation levels, each dose rate measured around the teletherapy source while in the "off" position and the average of all measurements, a plan of the areas surrounding the treatment room that were surveyed, the measured dose rate at several points in each area expressed in millirems (μSv) per hour, the calculated maximum level of radiation over a period of one week for each restricted and unrestricted area, and the signature of the radiation safety officer.

41.2(61) Safety spot checks for teletherapy facilities.

a. A licensee shall promptly check all systems listed in 41.2(59) "g" for proper function after each installation of a teletherapy source and after making any change for which an amendment is required by 41.2(51).

b. If the results of the safety spot checks required in 41.2(61) "a" indicate the malfunction of any system specified in 41.2(59), the licensee shall lock the control console in the "off" position and not use the unit except as may be necessary to repair, replace, or check the malfunctioning system.

c. A licensee shall maintain a record of the safety spot checks following installation of a source for three years. The record shall include notations indicating the operability of each entrance door interlock, each electrical or mechanical stop, each beam condition indicator light, the viewing system, doors, and the signature of the radiation safety officer.

41.2(62) Modification of teletherapy unit or room before beginning a treatment program. If the survey required by 41.2(60) indicates that any individual member of the public is likely to receive a dose greater than those permitted by 641—40.26(136C) before beginning the treatment program, the licensee shall:

a. Either equip the unit with stops or add additional radiation shielding to ensure compliance with 641—40.26(136C);

b. Perform the survey required by 41.2(60) again; and

c. Include in the report required by 41.2(63) the results of the initial survey, a description of the modification made to comply with 41.2(62) "a," and the results of the second survey; or

d. Request and receive a license amendment under 641—40.26(136C) that authorizes radiation levels in unrestricted areas greater than those permitted by 641—40.26(136C).

41.2(63) Reports of teletherapy surveys, checks, tests, and measurements. A licensee shall furnish a copy of the records required in 41.2(60), 41.2(61), and 41.2(62) and the output from the teletherapy source expressed as rems (sieverts) per hour at 1 meter from the source as determined during the full calibration required in 41.2(58) to the agency within 30 days following completion of the action that initiated the record requirement.

41.2(64) Five-year inspection.

a. A licensee shall have each teletherapy unit and gamma stereotactic radiosurgery unit fully inspected and serviced during teletherapy source replacement or at intervals not to exceed five years, whichever comes first, to ensure proper functioning of the source exposure mechanism.

b. This inspection and servicing shall be performed only by persons specifically licensed to do so by the agency, an agreement state, or the U.S. Nuclear Regulatory Commission.

c. A licensee shall maintain a record of the inspection and servicing for the duration of the license. The record shall contain the inspector's name, the inspector's license number, the date of inspection, the manufacturer's name and model number and serial number for both the teletherapy unit and gamma stereotactic radiosurgery unit and source, a list of components inspected, a list of components serviced and the type of service, a list of components replaced, and the signature of the inspector.

41.2(65) Training for radiation safety officer. Except as provided in 41.2(75), the licensee shall require an individual fulfilling the responsibilities of the radiation safety officer as provided in 41.2(8) to be an individual who:

a. Is certified by a specialty board whose certification process has been recognized by this agency, NRC, or an agreement state and who meets the requirements in 41.2(65) "d" and "e." (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC's web page.) To have its certification process recognized, a specialty board shall:

(1) Require all candidates for certification to:

1. Hold a bachelor's or graduate degree from an accredited college or university in physical science or engineering or biological science with a minimum of 20 college credits in physical science;

2. Have five or more years of professional experience in health physics (graduate training may be substituted for no more than two years of the required experience) including at least three years in applied health physics; and

3. Pass an examination administered by diplomats of the specialty board, which evaluates knowledge and competence in radiation physics and instrumentation, radiation protection, mathematics pertaining to the use and measurement of radioactivity, radiation biology, and radiation dosimetry; or

(2) Require all candidates for certification to:

1. Hold a master's or doctor's degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university;

2. Have two years of either full-time practical training or supervised experience in medical physics under the supervision of a medical physicist who is certified in medical physics by a specialty board recognized by the agency, NRC, or an agreement state, or in clinical nuclear medicine facilities providing either diagnostic or therapeutic services under the direction of physicians who meet the requirements for authorized users in 41.2(68), 41.2(69), or 41.2(75); and

3. Pass an examination administered by diplomats of the specialty board that assesses knowledge and competence in clinical diagnostic radiological or nuclear medicine physics and in radiation safety; or

b. Has completed a structured educational program consisting of both:

(1) 200 hours of classroom and laboratory training in the following areas:

1. Radiation physics and instrumentation;

2. Radiation protection;

3. Mathematics pertaining to the use and measurement of radioactivity;

4. Radiation biology; and

5. Radiation dosimetry; and

(2) One year of full-time radiation safety experience under the supervision of the individual identified as the radiation safety officer on an agency, NRC, or agreement state license or permit issued by the NRC master material licensee that authorizes similar types of use of radioactive material involving the following:

1. Shipping, receiving, and performing related radiation surveys;
2. Using and performing checks for proper operation of instruments used to determine the activity of dosages, survey meters, and instruments used to measure radionuclides;
3. Securing and controlling radioactive material;
4. Using administrative controls to avoid mistakes in the administration of radioactive material;
5. Using procedures to prevent or minimize radioactive contamination and using proper decontamination procedures;
6. Using emergency procedures to control radioactive material; and
7. Disposing of radioactive material; or

c. (1) Is a medical physicist who has been certified by a specialty board whose certification process has been recognized by the agency, NRC, or an agreement state under 41.2(74) and has experience in radiation safety for similar types of use of radioactive material for which the licensee is seeking the approval of the individual as a radiation safety officer and who meets the requirements in 41.2(65)“d” and “e”; or

(2) Is an authorized user, authorized medical physicist, or authorized nuclear pharmacist identified on the licensee’s license and has experience with the radiation safety aspects of similar types of use of radioactive material for which the individual has radiation safety officer responsibilities; and

d. Has obtained written attestation, signed by a preceptor radiation safety officer, that the individual has satisfactorily completed the requirements in 41.2(65)“e” and 41.2(65)“a”(1)“1” and “2” or 41.2(65)“a”(2)“1” and “2” or 41.2(65)“b”(1) or 41.2(65)“c”(1), and has achieved a level of radiation safety knowledge sufficient to function independently as a radiation safety officer for a medical use licensee; and

e. Has training in the radiation safety, regulatory issues, and emergency procedures for the types of use for which the licensee is seeking approval. This training requirement may be satisfied by completing training that is supervised by a radiation safety officer, authorized medical physicist, authorized nuclear pharmacist, or authorized user, as appropriate, who is authorized for the type of use for which the licensee is seeking approval.

41.2(66) Training for experienced radiation safety officer. Rescinded IAB 3/29/06, effective 5/3/06.

41.2(67) Training for uptake, dilution, and excretion studies. Except as provided in 41.2(75), the licensee shall require an authorized user of unsealed radioactive material for the uses authorized under 41.2(31) to be a physician who:

a. Is certified by a medical specialty board whose certification process has been recognized by the agency, NRC, or an agreement state and who meets the requirements in 41.2(67)“c.” (The names of specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC’s web page.) To have its certification process recognized, a specialty board shall require all candidates for certification to:

(1) Complete 60 hours of training and experience in basic radionuclide handling techniques and radiation safety applicable to the medical use of unsealed radioactive material for uptake, dilution, and excretion studies as described in 41.2(67)“c”(1)“1” and “2”; and

(2) Pass an examination administered by diplomats of the specialty board that assesses knowledge and competence in radiation safety, radionuclide handling, and quality control; or

b. Is an authorized user under 41.2(68) or 41.2(69) or meets equivalent NRC or agreement state requirements; or

c. (1) Has completed 60 hours of training and experience, including a minimum of 8 hours of classroom and laboratory training, in basic radionuclide handling techniques applicable to the medical use of unsealed radioactive material for uptake, dilution, and excretion studies. The training and experience must include:

1. Classroom and laboratory training in radiation physics and instrumentation; radiation protection; mathematics pertaining to the use and measurement of radioactivity, chemistry of radioactive material for medical use, and radiation biology; and

2. Work experience, under the supervision of an authorized user who meets the requirements in 41.2(67), 41.2(68), 41.2(69) or 41.2(75) or equivalent NRC or agreement state requirements, involving:

- Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
- Performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters;
- Calculating, measuring, and safely preparing patient or human research subject dosages;
- Using administrative controls to prevent a medical event involving the use of unsealed radioactive material;
- Using procedures to contain spilled radioactive material safely and using proper decontamination procedures;
- Administering dosages of radioactive drugs to patients or human research subjects; and

(2) Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in 41.2(67), 41.2(68), 41.2(69) or 41.2(75) or equivalent NRC or agreement state requirements, that the individual has satisfactorily completed the requirements in 41.2(67) "a"(1) or 41.2(67) "c"(1) and has achieved a level of competency sufficient to function independently as an authorized user for the medical uses authorized in 41.2(31).

41.2(68) Training for imaging and localization studies. Except as provided in 41.2(75), the licensee shall require the authorized user of unsealed radioactive material for the uses authorized under 41.2(33) to be a physician who:

a. Is certified by a medical specialty board whose certification process has been recognized by the agency, NRC, or an agreement state and who meets the requirements in 41.2(68) "c." (The names of specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC's web page.) To have its certification process recognized, a specialty board shall require all candidates for certification to:

(1) Complete 700 hours of training and experience in basic radionuclide handling techniques and radiation safety applicable to the medical use of unsealed radioactive material for imaging and localization studies as described in 41.2(68) "c"(1)"1" and "2"; and

(2) Pass an examination administered by diplomats of the specialty board, which assesses knowledge and competence in radiation safety, radionuclide handling, and quality control; or

b. Is an authorized user under 41.2(69) and meets the requirements in 41.2(68) "c"(1)"2," seventh bulleted paragraph, or equivalent NRC or agreement state requirements; or

c. (1) Has completed 700 hours of training and experience, including a minimum of 80 hours of classroom and laboratory training, in basic radionuclide handling techniques applicable to the medical use of unsealed radioactive material for imaging and localization studies. The training and experience must include, at a minimum:

1. Classroom and laboratory training in the following areas:

- Radiation physics and instrumentation;
- Radiation protection;
- Mathematics pertaining to the use and measurement of radioactivity;
- Chemistry of radioactive material for medical use;
- Radiation biology, and

2. Work experience, under the supervision of an authorized user who meets the requirements in 41.2(68); 41.2(68) "c"(1)"2," seventh bulleted paragraph, and 41.2(69); 41.2(75); or equivalent NRC or agreement state requirements, involving:

- Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
- Performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters;

- Calculating, measuring, and safely preparing patient or human research subject dosages;
- Using administrative controls to prevent a medical event involving the use of unsealed radioactive material;
- Using procedures to contain spilled radioactive material safely and using proper decontamination procedures;
- Administering dosages of radioactive drugs to patients or human research subjects; and
- Eluting generator systems appropriate for preparation of radioactive drugs for imaging and localization studies, measuring and testing the eluate for radionuclidic purity, and processing the eluate with reagent kits to prepare labeled radioactive drugs; and

(2) Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in 41.2(68); 41.2(69) and 41.2(68)“c”(1)“2,” seventh bulleted paragraph; 41.2(75); or equivalent NRC or agreement state requirements, that the individual has satisfactorily completed the requirements in 41.2(68)“a”(1) or 41.2(68)“c”(1) and has achieved a level of competency sufficient to function independently as an authorized user for the medical uses authorized under 41.2(31) and 41.2(33).

41.2(69) *Training for use of unsealed by-product material for which a written directive is required.* Except as provided in 41.2(75), the licensee shall require an authorized user of unsealed radioactive material for the uses authorized under 41.2(37) to be a physician who:

a. Is certified by a medical specialty board whose certification process has been recognized by the agency, NRC, or an agreement state and who meets the requirements in 41.2(69)“b”(1)“2,” seventh bulleted paragraph, and 41.2(69)“b”(2). (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC’s web page.) To be recognized, a specialty board shall require all candidates for certification to:

(1) Successfully complete residency training in a radiation therapy or nuclear medicine training program or a program in a related medical specialty. These residency training programs must include 700 hours of training and experience as described in 41.2(69)“b”(1)“1” through 41.2(69)“b”(1)“2,” fifth bulleted paragraph. Eligible training programs must be approved by the Residency Review Committee of the Accreditation Council for Graduate Medical Education, the Royal College of Physicians and Surgeons of Canada, or the Committee on Post-Graduate Training of the American Osteopathic Association; and

(2) Pass an examination, administered by diplomats of the specialty board, which tests knowledge and competence in radiation safety, radionuclide handling, quality assurance, and clinical use of unsealed radioactive material for which a written directive is required; or

b. (1) Has completed 700 hours of training and experience, including a minimum of 200 hours of classroom and laboratory training, in basic radionuclide handling techniques applicable to the medical use of unsealed radioactive material requiring a written directive. The training and experience must include:

1. Classroom and laboratory training in the following areas:

- Radiation physics and instrumentation;
- Radiation protection;
- Mathematics pertaining to the use and measurement of radioactivity;
- Chemistry of radioactive material for medical use; and
- Radiation biology; and

2. Work experience, under the supervision of an authorized user who meets the requirements in 41.2(69) or 41.2(75) or equivalent NRC or agreement state requirements. A supervising authorized user who meets the requirements in 41.2(69)“b” must also have experience in administering dosages in the same dosage category or categories (i.e., 41.2(69)“b”(1)“2,” seventh bulleted paragraph) as the individual requesting authorized user status. The work experience must involve:

- Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
- Performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters;

- Calculating, measuring, and safely preparing patient or human research subject dosages;
- Using administrative controls to prevent a medical event involving the use of unsealed radioactive material;
 - Using procedures to contain spilled radioactive material safely and using proper decontamination procedures;
 - Reserved.
 - Administering dosages of radioactive drugs to patients or human research subjects involving a minimum of three cases in each of the following categories for which the individual is requesting authorized user status:
 - Oral administration of less than or equal to 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131, for which a written directive is required;
 - Oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131 (experience with at least three cases in this category also satisfies the requirement in the above category);
 - Parenteral administration of either any beta emitter or a photon-emitting radionuclide with a photon energy less than 150 keV for which a written directive is required; or
 - Parenteral administration of any other radionuclide for which a written directive is required; and
- (2) Has obtained written attestation that the individual has satisfactorily completed the requirements in 41.2(69) “a”(1) and 41.2(69) “b”(1)“2,” seventh bulleted paragraph, or 41.2(69) “b”(1), and has achieved a level of competency sufficient to function independently as an authorized user for the medical uses authorized under 41.2(37). The written attestation must be signed by a preceptor authorized user who meets the requirements in 41.2(69) or 41.2(75) or equivalent NRC or agreement state requirements. The preceptor authorized user who meets the requirements in 41.2(69) “b” must have experience in administering dosages in the same dosage category or categories (i.e., 41.2(69) “b”(1)“2,” seventh bulleted paragraph) as the individual requesting authorized user status.

c. For training only for oral administration of sodium iodide I-131 requiring a written directive in quantities less than or equal to 33 millicuries (1.22 gigabecquerels) or quantities greater than 33 millicuries (1.22 gigabecquerels), see 41.2(81) or 41.2(82).

41.2(70) Training for use of manual brachytherapy sources. Except as provided in 41.2(75), the licensee shall require an authorized user of a manual brachytherapy source for the uses authorized under 41.2(43) to be a physician who:

a. Is certified by a medical specialty board whose certification process has been recognized by the agency, NRC, or an agreement state, and who meets the requirements in 41.2(70) “b”(3). (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC’s web page.) To have its certification process recognized, a specialty board shall require all candidates for certification to:

(1) Successfully complete a minimum of three years of residency training in a radiation oncology program approved by the Residency Review Committee of the Accreditation Council for Graduate Medical Education or the Royal College of Physicians and Surgeons of Canada or the Committee on Post-Graduate Training of the American Osteopathic Association; and

(2) Pass an examination, administered by diplomats of the specialty board, that tests knowledge and competence in radiation safety, radionuclide handling, treatment planning, quality assurance, and clinical use of manual brachytherapy; or

b. (1) Has completed a structured educational program in basic radionuclide handling techniques applicable to the use of manual brachytherapy sources that includes:

1. 200 hours of classroom and laboratory training in the following areas:

- Radiation physics and instrumentation;
- Radiation protection;
- Mathematics pertaining to the use and measurement of radioactivity; and
- Radiation biology; and

2. 500 hours of work experience, under the supervision of an authorized user who meets the requirements in 41.2(70) or 41.2(75) or equivalent NRC or agreement state requirements at a medical institution, involving:

- Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
- Checking survey meters for proper operation;
- Preparing, implanting, and removing brachytherapy sources;
- Maintaining running inventories of material on hand;
- Using administrative controls to prevent a medical event involving the use of radioactive material; and
- Using emergency procedures to control radioactive material; and

(2) Has completed three years of supervised clinical experience in radiation oncology under an authorized user who meets the requirements in 41.2(70) or 41.2(75) or equivalent NRC or agreement state requirements, as part of a formal training program approved by the Residency Review Committee for Radiation Oncology of the Accreditation Council for Graduate Medical Education or the Royal College of Physicians and Surgeons of Canada or the Committee on Postdoctoral Training of the American Osteopathic Association. This experience may be obtained concurrently with the supervised work experience required in 41.2(70) "b"(1)"2"; and

(3) Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in 41.2(70) or 41.2(75) or equivalent NRC or agreement state requirements, that the individual has satisfactorily completed the requirements in 41.2(70) "a"(1) or 41.2(70) "b"(1) and (2), and has achieved a level of competency sufficient to function independently as an authorized user of manual brachytherapy sources for the medical uses authorized under 41.2(43).

41.2(71) Training for ophthalmic use of strontium-90. Except as provided in 41.2(75), the licensee shall require the authorized user of strontium-90 for ophthalmic radiotherapy to be a physician who:

- a. Is an authorized user under 41.2(70) or equivalent NRC or agreement state requirements; or
- b. (1) Has completed 24 hours of classroom and laboratory training applicable to the medical use of strontium-90 for ophthalmic radiotherapy. The training must include:

1. Radiation physics and instrumentation;
2. Radiation protection;
3. Mathematics pertaining to the use and measurement of radioactivity; and
4. Radiation biology; and

(2) Has completed supervised clinical training in ophthalmic radiotherapy under the supervision of an authorized user at a medical institution, clinic, or private practice that includes the use of strontium-90 for the ophthalmic treatment of five individuals. This supervised clinical training must involve:

1. Examination of each individual to be treated;
2. Calculation of the dose to be administered;
3. Administration of the dose; and
4. Follow-up and review of each individual's case history; and

(3) Has obtained written attestation, signed by a preceptor authorized user who meets the requirements in 41.2(70), 41.2(71) or 41.2(75) or equivalent NRC or agreement state requirements, that the individual has satisfactorily completed the requirements in 41.2(71) "b"(1) and (2) and has achieved a level of competency sufficient to function independently as an authorized user of strontium-90 for ophthalmic use.

41.2(72) Training for use of sealed sources for diagnosis. Except as provided in 41.2(75), the licensee shall require the authorized user of a diagnostic sealed source for use in a device authorized under 41.2(41) to be a physician, dentist, or podiatrist who:

- a. Is certified by a specialty board whose certification process includes all of the requirements in 41.2(72) "b" and "c" and whose certification has been recognized by the agency, NRC, or an agreement state. (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC's web page.); or
- b. Has completed eight hours of classroom and laboratory training in basic radionuclide handling techniques specifically applicable to the use of the device. The training must include:

- (1) Radiation physics and instrumentation;
- (2) Radiation protection;

- (3) Mathematics pertaining to the use and measurement of radioactivity; and
- (4) Radiation biology; and

c. Has completed training in the use of the device for the uses requested.

41.2(73) Training for use of remote afterloader units, teletherapy units, and gamma stereotactic radiosurgery units. Except as provided in 41.2(75), the licensee shall require an authorized user of a sealed source for a use authorized under 41.2(49) to be a physician who:

a. Is certified by a medical specialty board whose certification process has been recognized by the agency, NRC, or an agreement state, and who meets the requirements in 41.2(73) "b"(3) and 41.2(73) "c." (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC's web page.) To have its certification process recognized, a specialty board shall require all candidates for certification to:

(1) Successfully complete a minimum of three years of residency training in a radiation therapy program approved by the Residency Review Committee of the Accreditation Council for Graduate Medical Education or the Royal College of Physicians and Surgeons of Canada or the Committee on Post-Graduate Training of the American Osteopathic Association; and

(2) Pass an examination, administered by diplomats of the specialty board, which tests knowledge and competence in radiation safety, radionuclide handling, treatment planning, quality assurance, and clinical use of stereotactic radiosurgery, remote afterloaders, and external beam therapy; or

b. (1) Has completed a structured educational program in basic radionuclide techniques applicable to the use of a sealed source in a therapeutic medical unit that includes:

1. 200 hours of classroom and laboratory training in the following areas:

- Radiation physics and instrumentation;
- Radiation protection;
- Mathematics pertaining to the use and measurement of radioactivity; and
- Radiation biology; and

2. 500 hours of work experience, under the supervision of an authorized user who meets the requirements in 41.2(73) or 41.2(75) or equivalent NRC or agreement state requirements at a medical institution, involving:

- Reviewing full calibration measurements and periodic spot checks;
- Preparing treatment plans and calculating treatment doses and times;
- Using administrative controls to prevent a medical event involving the use of radioactive material;
- Implementing emergency procedures to be followed in the event of the abnormal operation of the medical unit or console;
- Checking and using survey meters; and
- Selecting the proper dose and how it is to be administered; and

(2) Has completed three years of supervised clinical experience in radiation therapy under an authorized user who meets the requirements in 41.2(73) or 41.2(75) or equivalent NRC or agreement state requirements, as part of a formal training program approved by the Residency Review Committee for Radiation Oncology of the Accreditation Council for Graduate Medical Education or the Royal College of Physicians and Surgeons of Canada or the Committee on Postdoctoral Training of the American Osteopathic Association. This experience may be obtained concurrently with the supervised work experience required by 41.2(73) "b"(1) "2"; and

(3) Has obtained written attestation that the individual has satisfactorily completed the requirements in 41.2(73) "a"(1) or 41.2(73) "b"(1) and (2), and 41.2(73) "c," and has achieved a level of competency sufficient to function independently as an authorized user of each type of therapeutic medical unit for which the individual is requesting authorized user status. The written attestation must be signed by a preceptor authorized user who meets the requirements in 41.2(73) or 41.2(75) or equivalent NRC or agreement state requirements for an authorized user for each type of therapeutic medical unit for which the individual is requesting authorized user status; and

c. Has received training in device operation, safety procedures, and clinical use for the type of use for which authorization is sought. This training requirement may be satisfied by satisfactory completion

of a training program provided by the vendor for new users or by receiving training supervised by an authorized user or authorized medical physicist, as appropriate, who is authorized for the type of use for which the individual is seeking authorization.

41.2(74) Training for an authorized medical physicist. Except as provided in 41.2(75), the licensee shall require the authorized medical physicist to be an individual who:

a. Is certified by a specialty board whose certification process has been recognized by the agency, NRC, or an agreement state and who meets the requirements in 41.2(74)“*b*”(2) and 41.2(74)“*c*.” (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC’s web page.) To have its certification process recognized, a specialty board shall require all candidates for certification to:

(1) Hold a master’s or doctor’s degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university;

(2) Have two years of either full-time practical training or supervised experience in medical physics:

1. Under the supervision of a medical physicist who is certified in medical physics by a specialty board recognized by the agency, NRC, or an agreement state; or

2. In clinical radiation facilities providing high-energy, external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services under the direction of physicians who meet the requirements for authorized users in 41.2(70), 41.2(73), or 41.2(75); and

(3) Pass an examination, administered by diplomats of the specialty board, that assesses knowledge and competence in clinical radiation therapy, radiation safety, calibration, quality assurance, and treatment planning for external beam therapy, brachytherapy, and stereotactic radiosurgery; or

b. (1) Holds a master’s or doctor’s degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university; and has completed one year of full-time training in medical physics and an additional year of full-time work experience under the supervision of an individual who meets the requirements for an authorized medical physicist for the type of use for which the individual is seeking authorization. This training and work experience must be conducted in clinical radiation facilities that provide high-energy, external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services and must include:

1. Performing sealed source leak tests and inventories;

2. Performing decay corrections;

3. Performing full calibration and periodic spot checks of external beam treatment units, stereotactic radiosurgery units, and remote afterloading units, as applicable; and

4. Conducting radiation surveys around external beam treatment units, stereotactic radiosurgery units, and remote afterloading units, as applicable; and

(2) Has obtained written attestation that the individual has satisfactorily completed the requirements in 41.2(74)“*a*”(1) and (2) and 41.2(74)“*c*” or 41.2(74)“*b*”(1) and 41.2(74)“*c*,” and has achieved a level of competency sufficient to function independently as an authorized medical physicist for each type of therapeutic medical unit for which the individual is requesting authorized medical physicist status. The written attestation must be signed by a preceptor authorized medical physicist who meets the requirements in 41.2(74) or 41.2(75) or equivalent NRC or agreement state requirements for an authorized medical physicist for each type of therapeutic medical unit for which the individual is requesting authorized medical physicist status; and

c. Has training for the type of use for which authorization is sought that includes hands-on device operation, safety procedures, clinical use, and the operation of a treatment planning system. This training requirement may be satisfied by satisfactorily completing either a training program provided by the vendor or by training supervised by an authorized medical physicist who is authorized for the type of use for which the individual is seeking authorization.

41.2(75) Training for experienced radiation safety officer, authorized medical physicist, nuclear pharmacist, authorized nuclear pharmacist, authorized users and teletherapy or medical physicists.

a. (1) An individual identified as a radiation safety officer, teletherapy or medical physicist, or nuclear pharmacist on an agency, NRC or agreement state license or a permit issued by an NRC or agreement state broad scope licensee or master material license permit or by a master material license permittee of broad scope before January 1, 2003, does not need to comply with the training requirements of 41.2(65), 41.2(74), or 41.2(78).

(2) An individual identified as a radiation safety officer, an authorized medical physicist, or an authorized nuclear pharmacist on the agency, NRC, or agreement state license or permit issued by the agency, NRC, or agreement state broad scope licensee or issued by master material license permit or issued by a master material license permittee of broad scope between January 1, 2003, and May 3, 2006, need not comply with the training requirements of 41.2(65), 41.2(74), or 41.2(78).

b. (1) Physicians, dentists, or podiatrists identified as authorized users for the medical use of radioactive material on a license issued by the agency, the NRC, or agreement state, a permit issued by an NRC master material licensee, a permit issued by an NRC broad scope licensee, or a permit issued by an NRC master material license broad scope permittee before January 1, 2003, who perform only those medical uses for which they were authorized before that date need not comply with the training requirements of 41.2(67), 41.2(68), 41.2(69), 41.2(70), 41.2(71), 41.2(72), 41.2(73), 41.2(81), 41.2(82), or 41.2(89).

(2) Physicians, dentists, or podiatrists identified as authorized users for the medical use of radioactive material issued by the agency, the NRC, or agreement state, a permit issued by an NRC master material licensee, a permit issued by an NRC broad scope licensee, or a permit issued by an NRC master material license broad scope permittee who perform only those medical uses for which they were authorized between January 1, 2003, and May 3, 2006, need not comply with the training requirements of 41.2(67), 41.2(68), 41.2(69), 41.2(70), 41.2(71), 41.2(72), 41.2(73), 41.2(81), 41.2(82), or 41.2(89).

c. Individuals who need not comply with training requirements as described in this subrule may serve as preceptors for, and supervisors of, applicants seeking authorization on an agency license for the same uses for which these individuals are authorized.

41.2(76) *Physician training in a three-month program.* Rescinded IAB 8/1/07, effective 9/5/07.

41.2(77) *Recentness of training.* The training and experience specified in 41.2(65) to 41.2(78) and 41.2(81), 41.2(82), and 41.2(89) shall have been obtained within the seven years preceding the date of application or the individual shall have had related continuing education and continuing applicable experience since the required training and experience were completed.

41.2(78) *Training for an authorized nuclear pharmacist.* Except as provided in 41.2(75), the licensee shall require the authorized nuclear pharmacist to be a pharmacist who:

a. Is certified as a nuclear pharmacist by a specialty board whose certification process includes all of the requirements of 41.2(78) "b." (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC's web page.) To have its certification process recognized, a specialty board shall require all candidates for certification to:

(1) Have graduated from a pharmacy program accredited by the American Council on Pharmaceutical Education (ACPE) or have passed the Foreign Pharmacy Graduate Examination Committee (FPGEC) examination;

(2) Hold a current, active license to practice pharmacy;

(3) Provide evidence of having acquired at least 4,000 hours of combined training and experience in nuclear pharmacy practice. Academic training may be substituted for no more than 2,000 hours of the required training and experience; and

(4) Pass an examination in nuclear pharmacy administered by diplomats of the specialty board that assesses knowledge and competency in procurement, compounding, quality assurance, dispensing, distribution, health and safety, radiation safety, provision of information and consultation, monitoring patient outcomes, research and development; or

b. Has completed 700 hours in a structured education program consisting of both:

(1) 200 hours of classroom and laboratory training in the following areas:

1. Radiation physics and instrumentation;

2. Radiation protection;

3. Mathematics pertaining to the use and measurement of radioactivity;
4. Chemistry of radioactive material for medical use; and
5. Radiation biology; and
- (2) Supervised practical experience in a nuclear pharmacy involving:
 1. Shipping, receiving, and performing related radiation surveys;
 2. Using and performing checks for proper operation of instruments used to determine the activity of dosages, survey meters and, if appropriate, instruments used to measure alpha- or beta-emitting radionuclides;
 3. Calculating, assaying, and safely preparing dosages for patients or human research subjects;
 4. Using administrative controls to avoid medical events in the administration of by-product material; and
 5. Using procedures to prevent or minimize radioactive contamination and using proper decontamination procedures; and
- c. Has obtained written attestation, signed by a preceptor authorized nuclear pharmacist, that the individual satisfactorily completed the requirements in 41.2(78) "a"(1), (2), and (3), or 41.2(78) "b"(1) and has achieved a level of competency sufficient to function independently as an authorized nuclear pharmacist.

41.2(79) *Training for experienced nuclear pharmacists.* Rescinded IAB 8/1/07, effective 9/5/07.

41.2(80) *Training for nuclear medicine technologists.* Rescinded IAB 4/2/03, effective 5/7/03.

41.2(81) *Training for the oral administration of sodium iodide I-131 requiring a written directive in quantities less than or equal to 33 millicuries (1.22 gigabecquerels).* Except as provided in 41.2(75), the licensee shall require an authorized user for the oral administration of sodium iodide I-131 requiring a written directive in quantities less than or equal to 33 millicuries (1.22 gigabecquerels) to be a physician who:

a. Is certified by a medical specialty board whose certification process includes all of the requirements in 41.2(81) "c"(1) and (2) and whose certification process has been recognized by the agency, NRC, or an agreement state and who meets the requirements in 41.2(81) "c"(3). (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC's web page.); or

b. Is an authorized user under 41.2(69) "a" or "b" for uses in the oral administration of less than or equal to 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131 for which a written directive is required, or oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131 or 41.2(82) or equivalent NRC or agreement state requirements; or

c. (1) Has successfully completed 80 hours of classroom and laboratory training, applicable to the medical use of sodium iodide I-131 for procedures requiring a written directive. The training must include:

1. Radiation physics and instrumentation;
2. Radiation protection;
3. Mathematics pertaining to the use and measurement of radioactivity;
4. Chemistry of radioactive material for medical use; and
5. Radiation biology; and

(2) Has work experience, under the supervision of an authorized user who meets the requirements in 41.2(69) "a" or "b," 41.2(75), 41.2(81) or 41.2(82) or equivalent NRC or agreement state requirements. A supervising authorized user who meets the requirements in 41.2(69) "b" must also have experience in administering dosages as follows: oral administration of less than or equal to 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131, for which a written directive is required; or oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131. The work experience must involve:

1. Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
2. Performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters;

3. Calculating, measuring, and safely preparing patient or human research subject dosages;
4. Using administrative controls to prevent a medical event involving the use of radioactive material;
5. Using procedures to contain spilled radioactive material safely and using proper decontamination procedures; and
6. Administering dosages to patients or human research subjects that include at least three cases involving the oral administration of less than or equal to 33 millicuries (1.22 Gigabecquerels) of sodium iodide I-131; and

(3) Has obtained written attestation that the individual has satisfactorily completed the requirements in 41.2(81)“c”(1) and (2), and has achieved a level of competency sufficient to function independently as an authorized user for medical uses authorized under 41.2(37). The written attestation must be signed by a preceptor authorized user who meets the requirements in 41.2(69), 41.2(75), 41.2(81) or 41.2(82) or equivalent NRC or agreement state requirements. A preceptor authorized user who meets the requirements in 41.2(69)“b” must also have experience in administering dosages as follows: oral administration of less than or equal to 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131, for which a written directive is required; or oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131.

41.2(82) *Training for the oral administration of sodium iodide I-131 requiring a written directive in quantities greater than 33 millicuries (1.22 gigabecquerels).* Except as provided in 41.2(75), the licensee shall require an authorized user for the oral administration of sodium iodide I-131 requiring a written directive in quantities greater than 33 millicuries (1.22 gigabecquerels) to be a physician who:

a. Is certified by a medical specialty board whose certification process includes all of the requirements in 41.2(82)“c”(1) and (2), and whose certification has been recognized by the agency, NRC, or agreement state, and who meets the requirements in 41.2(82)“c”(3). (The names of the specialty boards that have been recognized by the agency, NRC, or agreement state must be posted on the NRC’s web page.); or

b. Is an authorized user under 41.2(69)“a” or “b” for oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131 or meets equivalent NRC or agreement state requirements; or

c. (1) Has successfully completed 80 hours of classroom and laboratory training, applicable to the medical use of sodium iodide I-131 for procedures requiring a written directive. The training must include:

1. Radiation physics and instrumentation;
2. Radiation protection;
3. Mathematics pertaining to the use and measurement of radioactivity;
4. Chemistry of radioactive material for medical use; and
5. Radiation biology; and

(2) Has work experience, under the supervision of an authorized user who meets the requirements in 41.2(69)“a” or “b,” 41.2(75) or 41.2(82) or equivalent NRC or agreement state requirements. A supervising authorized user who meets the requirements in 41.2(69)“b” must also have experience in oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131. The work experience must involve:

1. Ordering, receiving, and unpacking radioactive materials safely and performing the related radiation surveys;
2. Performing quality control procedures on instruments used to determine the activity of dosages and performing checks for proper operation of survey meters;
3. Calculating, measuring, and safely preparing patient or human research subject dosages;
4. Using administrative controls to prevent a medical event involving the use of radioactive material;
5. Using procedures to contain spilled radioactive material safely and using proper decontamination procedures; and

6. Administering dosages to patients or human research subjects that include at least three cases involving the oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131; and

(3) Has obtained written attestation that the individual has satisfactorily completed the requirements in 41.2(82)“c”(1) and (2), and has achieved a level of competency sufficient to function independently as an authorized user for medical uses authorized in 41.2(37). The written attestation must be signed by a preceptor authorized user who meets the requirements in 41.2(69), 41.2(75) or 41.2(82) or equivalent NRC or agreement state requirements. A preceptor authorized user who meets the requirements in 41.2(69)“b” must also have experience in oral administration of greater than 33 millicuries (1.22 gigabecquerels) of sodium iodide I-131.

41.2(83) Provisions for the protection of human research subjects.

a. A licensee may conduct research involving human research subjects only if the licensee uses the radioactive materials authorized on its specific license for the uses authorized on its license.

b. If the research is conducted, funded, supported, or regulated by another federal agency that has implemented Federal Policy for the Protection of Human Subjects (Federal Policy), the licensee shall, before conducting research:

(1) Obtain review and approval of the research from an “Institutional Review Board,” as defined and described in the Federal Policy; and

(2) Obtain “informed consent,” as defined and described in the Federal Policy, from the human research subjects.

c. If the research will not be conducted, funded, supported, or regulated by another federal agency that has implemented the Federal Policy, the licensee shall, before conducting research, apply for and receive a specific amendment to its medical use license. The amendment request must include a written commitment that the licensee will, before conducting research:

(1) Obtain review and approval of the research from an “Institutional Review Board,” as defined and described in the Federal Policy; and

(2) Obtain “informed consent,” as defined and described in the Federal Policy, from the human research subjects.

d. Nothing in this subrule relieves a licensee from complying with the other requirements of these rules.

41.2(84) Calibration measurements of brachytherapy sources.

a. Before the first medical use of a brachytherapy source on or after January 1, 2003, a licensee shall have:

(1) Determined the source output or activity using a dosimetry system that meets the requirements of 41.2(57);

(2) Determined the source positioning accuracy within applicators; and

(3) Used published protocols currently accepted by nationally recognized bodies to meet the requirements of 41.2(84)“a.”

b. A licensee may use measurements that are provided by the source manufacturer or by a calibration laboratory accredited by the American Association of Physicists in Medicine and that are made in accordance with 41.2(84)“a”(1) and (2).

c. A licensee shall mathematically correct the outputs or activities determined in 41.2(84)“a” for physical decay at intervals consistent with 1 percent physical decay.

d. A licensee shall retain a record of each calibration for three years after the last use of the source. The record must include:

(1) The date of the calibration;

(2) The manufacturer’s name, model number, and serial number for the source and the instruments used to calibrate the source;

(3) The source output or activity;

(4) The source positioning accuracy within the applicators; and

(5) The signature of the authorized medical physicist.

41.2(85) Decay of strontium-90 sources for ophthalmic treatment.

a. Only an authorized medical physicist shall calculate the activity of each strontium-90 source that is used to determine the treatment times for ophthalmic treatments. The decay must be based on the activity determined under 41.2(84).

b. A licensee shall retain a record of the activity of each strontium-90 source in accordance with 41.2(84).

41.2(86) Therapy-related computer systems. The licensee shall perform acceptance testing on the treatment planning system of therapy-related computer systems in accordance with published protocols accepted by nationally recognized bodies. At a minimum, the acceptance must include, as applicable, verification of:

- a. The source-specific input parameters required by the dose calculation algorithm;
- b. The accuracy of dose, dwell time, and treatment time calculations at representative points;
- c. The accuracy of isodose plots and graphic displays;
- d. The accuracy of the software used to determine sealed source positions from radiographic images; and
- e. The accuracy of electronic transfer of the treatment delivery parameters to the treatment delivery unit from the treatment planning system.

41.2(87) Written directives. Each licensee or registrant shall meet the following objectives:

a. A written directive must be dated and signed by an authorized user before the administration of I-131 sodium iodide greater than 30 microcuries, any therapeutic dosage of unsealed by-product material or any therapeutic dose of radiation from by-product material.

(1) If, because of the emergent nature of the patient's condition, a delay in order to provide a written directive would jeopardize the patient's health, an oral directive is acceptable.

(2) The information contained in the oral directive must be documented as soon as possible in writing in the patient's record. A written directive must be prepared within 48 hours of the oral directive.

b. Prior to administration, a written directive must contain the patient's or human research subject's name and the following information:

(1) For any administration of quantities greater than 30 microcuries of either sodium iodide I-125 or I-131: the dosage;

(2) For a therapeutic administration of a radiopharmaceutical other than sodium iodide I-125 or I-131: the radiopharmaceutical, dosage, and route of administration;

(3) For gamma stereotactic radiosurgery: the total dose, treatment site, and values for the target coordinate setting per treatment for each anatomically distinct treatment site;

(4) For teletherapy: the total dose, dose per fraction, number of fractions, treatment site, and overall treatment period;

(5) For high-dose-rate remote afterloading brachytherapy: the radioisotope, treatment site, dose per fraction, number of fractions and total dose; or

(6) For all other brachytherapy, including low-, medium-, and pulsed-dose-rate remote afterloaders:

1. Prior to implantation: treatment site, the radioisotope, number of sources, and source strengths and dose; and

2. After implantation but prior to completion of the procedure: the radioisotope, treatment site, number of sources, and total source strength and exposure time (or, equivalently, the total dose);

(7) For therapeutic use of radiation machines, see 41.3(14).

c. Prior to each administration, the patient's or human research subject's identity is verified by more than one method as the individual named in the written directive.

d. The final plans of treatment and related calculations for brachytherapy, teletherapy, and gamma stereotactic radiosurgery are in accordance with the respective written directives.

e. Each administration is in accordance with the written directive through checking both manual and computer-generated dose calculations and verifying that any computer-generated dose calculations are correctly transferred into the consoles of the medical units authorized by 641—Chapter 41.

f. Any unintended deviation from the written directive is identified and evaluated, and appropriate action is taken.

g. A written revision to an existing written directive may be made if the revision is dated and signed by an authorized user before the administration of the dosage of unsealed by-product material, the brachytherapy dose, the gamma stereotactic radiosurgery dose, the teletherapy dose, or the next fractional dose.

(1) If, because of the patient's condition, a delay in order to provide a written revision to an existing written directive would jeopardize the patient's health, an oral revision to an existing written directive is acceptable.

(2) The oral revision must be documented as soon as possible in the patient's record. A revised written directive must be signed by the authorized user with 48 hours of the oral revision.

h. A copy of the written directive in auditable form shall be retained for three years after the date of administration.

41.2(88) *Other medical uses of by-product material or radiation from by-product material.* A licensee may use by-product material or a radiation source approved for medical use which is not specifically addressed in 641—41.2(136C)(e.g., Y-90 microspheres, liquid brachytherapy, intravascular brachytherapy) if:

a. The applicant or licensee has submitted the information required by the agency; and

b. The applicant or licensee has received written approval from the agency in a license or license amendment and uses the material in accordance with the regulations and specific conditions the agency considers necessary for the medical use of the material.

41.2(89) *Training for the parenteral administration of unsealed by-product material requiring a written directive.* Except as provided in 41.2(75), the licensee shall require an authorized user for the parenteral administration requiring a written directive to be a physician who:

a. Is an authorized user under 41.2(69) for parenteral administration of either any beta emitter or a photon-emitting radionuclide with a photon energy less than 150 keV for which a written directive is required or equivalent NRC or agreement state requirements; or

b. Is an authorized user under 41.2(70) or 41.2(73) or equivalent NRC or agreement state requirements, and who meets the requirements in 41.2(89) "d"; or

c. Is certified by a medical specialty board whose certification process has been recognized by the NRC or an agreement state under 41.2(70) or 41.2(73) and who meets the requirements in 41.2(89) "d"; or

d. (1) Has successfully completed 80 hours of classroom and laboratory training, applicable to parenteral administrations, for which a written directive is required, of either any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV or parenteral administration of any other radionuclide for which a written directive is required. The training must include:

1. Radiation physics and instrumentation;

2. Radiation protection;

3. Mathematics pertaining to the use and measurement of radioactivity;

4. Chemistry of radioactive material for medical use; and

5. Radiation biology; and

(2) Has work experience, under the supervision of an authorized user who meets the requirements in 41.2(69), 41.2(75) or 41.2(89) or equivalent NRC or agreement state requirements, in the parenteral administration for which a written directive is required, of either any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV or parenteral administration of any other radionuclide for which a written directive is required. A supervising authorized user who meets the requirements in 41.2(69) must have experience in administering dosages of either any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV or parenteral administration of any other radionuclide for which a written directive is required. The work experience must involve:

1. Ordering, receiving, and unpacking radioactive materials safely, and performing the related radiation surveys;

2. Performing quality control procedures on instruments used to determine the activity of dosages, and performing checks for proper operation of survey meters;

3. Calculating, measuring, and safely preparing patient or human research subject dosages;

4. Using administrative controls to prevent a medical event involving the use of unsealed radioactive material;

5. Using procedures to contain spilled radioactive material safely, and using proper decontamination procedures; and

6. Administering dosages to patients or human research subjects, that include at least three cases involving the parenteral administration for which a written directive is required, of either any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV or at least three cases involving the parenteral administration of any other radionuclide for which a written directive is required; and

(3) Has obtained written attestation that the individual has satisfactorily completed the requirements in 41.2(89)“b” or “c,” and has achieved a level of competency sufficient to function independently as an authorized user for the parenteral administration of unsealed by-product material requiring a written directive. The written attestation must be signed by a preceptor authorized user who meets the requirements in 41.2(69), 41.2(75) or 41.2(89) or equivalent NRC or agreement state requirements. A preceptor authorized user who meets the requirements in 41.2(69) must have experience in administering dosages of either any beta emitter or any photon-emitting radionuclide with a photon energy less than 150 keV or at least three cases involving the parenteral administration of any other radionuclide for which a written directive is required.

[ARC 7983B, IAB 7/29/09, effective 9/2/09; ARC 8982B, IAB 8/11/10, effective 9/15/10; ARC 0577C, IAB 2/6/13, effective 3/13/13; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—41.3(136C) Therapeutic use of radiation machines.

41.3(1) Scope and applicability.

a. This subrule establishes requirements, for which the registrant is responsible, for use of therapeutic radiation machines.

b. The use of therapeutic radiation machines shall be by, or under the supervision of, a physician who meets the training/experience criteria established by 41.3(5).

c. Unless specifically required otherwise by 641—41.3(136C), all registrants are subject to the requirements of 641—Chapters 38 to 40.

41.3(2) Definitions. In addition to the definitions provided in 641—38.2(136C) and 641—40.2(136C), the following definitions are specific to 641—41.3(136C).

“*Accessible surface*” means surface of equipment or of an equipment part that can be easily or accidentally touched by persons without the use of a tool.

“*Added filtration*” means any filtration which is in addition to the inherent filtration.

“*Beam-limiting device*” means a field defining collimator, integral to the therapeutic radiation machine, which provides a means to restrict the dimensions of the useful beam.

“*Beam-scattering foil*” means a thin piece of material (usually metallic) placed in the beam to scatter a beam of electrons in order to provide a more uniform electron distribution in the useful beam.

“*Bent beam linear accelerator*” means a linear accelerator geometry in which the accelerated electron beam must change direction by passing through a bending magnet.

“*Contact therapy system*” means a therapeutic radiation machine with a short target-to-skin distance (TSD), usually less than 5 centimeters.

“*Dose monitor unit (DMU)*” means a unit response from the beam monitoring system from which the absorbed dose can be calculated.

“*External beam radiation therapy*” means therapeutic irradiation in which the source of radiation is at a distance from the body.

“*Field flattening filter*” means a filter used to homogenize the absorbed dose rate over the radiation field.

“*Filter*” means material placed in the useful beam to change beam quality or its intensity profile in therapeutic radiation machines.

“*Gantry*” means that part of a radiation therapy system supporting and allowing movements of the radiation head around a center of rotation.

“Interruption of irradiation” means the stopping of irradiation with the possibility of continuing irradiation without resetting of operating conditions at the control panel.

“Isocenter” means the center of the sphere through which the useful beam axis passes while the gantry moves through its full range of motions.

“Megavolt (MV) (mega electron volt (MeV))” means the energy equal to that acquired by a particle with one electron charge in passing through a potential difference of 1 million volts in a vacuum. (Note: Current convention is to use MV for photons and MeV for electrons.)

“Monitor unit (MU).” See “Dose monitor unit.”

“Moving beam radiation therapy” means radiation therapy with continuous displacement of one or more mechanical axes relative to the patient during irradiation. It includes arc therapy, skip therapy, conformal therapy, intensity modulation, and rotational therapy.

“Nominal treatment distance” means:

1. For electron irradiation, the distance from the scattering foil, virtual source, or exit window of the electron beam to the entrance surface of the irradiated object along the central axis of the useful beam.

2. For X-ray irradiation, the virtual source or target to isocenter distance along the central axis of the useful beam. For nonisocentric equipment, this distance shall be that specified by the manufacturer.

“Periodic quality assurance check” means a procedure which is performed to ensure that a previous calibration continues to be valid.

“Practical range of electrons” corresponds to classical electron range where the only remaining contribution to dose is from bremsstrahlung X-rays. A further explanation may be found in “Clinical Electron Beam Dosimetry: Report of AAPM Radiation Therapy Committee Task Group 25” (Medical Physics 18(1): 73-109, Jan/Feb 1991) and ICRU Report 35, “Radiation Dosimetry: Electron Beams with Energies Between 1 and 50 MeV,” International Agency on Radiation Units and Measurements, September 15, 1984.

“Radiation field.” See “Useful beam.”

“Radiation head” means the structure from which the useful beam emerges.

“Radiation therapy physicist” means an individual qualified in accordance with 41.3(6).

“Redundant beam monitoring system” means a combination of two dose monitoring systems in which each system is designed to terminate irradiation in accordance with a preselected number of dose monitor units.

“Shadow tray” means a device attached to the radiation head to support auxiliary beam blocking material.

“Stationary beam radiation therapy” means radiation therapy without displacement of one or more mechanical axes relative to the patient during irradiation.

“Target” means that part of an X-ray tube or accelerator onto which is directed a beam of accelerated particles to produce ionizing radiation or other particles.

“Tenth-value layer (TVL)” means the thickness of a specified material which attenuates X-radiation or gamma radiation to an extent such that the air kerma rate, exposure rate or absorbed dose rate is reduced to one-tenth of the value measured without the material at the same point.

“Therapeutic radiation machine” means X-ray or electron-producing equipment designed and used for external beam radiation therapy.

“Virtual source” means a point from which radiation appears to originate.

41.3(3) Registration or license requirements. No person shall receive, possess, use, transfer, own, or acquire therapeutic radiation machines except as authorized in a registration issued pursuant to 641—39.1(136C) to 39.4(136C).

41.3(4) General administrative requirements for facilities using therapeutic radiation machines.

- a. Administrative controls. The registrant shall be responsible for directing the operation of the therapeutic radiation machines which have been registered with the agency. The registrant or the registrant’s agent shall ensure that the requirements of 41.3(136C) are met in the operation of the therapeutic radiation machine(s).

b. A therapeutic radiation machine which does not meet the provisions of these regulations shall not be used for irradiation of patients unless authorized by the agency.

41.3(5) Training for external beam radiation therapy authorized users. The registrant for any therapeutic radiation machine subject to 41.3(17) or 41.3(18) shall require the authorized user to be a physician who:

a. Is certified in:

- (1) Radiology or therapeutic radiology by the American Board of Radiology; or
- (2) Radiation oncology by the American Osteopathic Board of Radiology; or
- (3) Radiology, with specialization in radiotherapy, as a British “Fellow of the Faculty of Radiology” or “Fellow of the Royal College of Radiology”; or
- (4) Therapeutic radiology by the Canadian Royal College of Physicians and Surgeons; or

b. Is in the active practice of therapeutic radiology, and has completed 200 hours of instruction in basic radiation techniques applicable to the use of an external beam radiation therapy unit, 500 hours of supervised work experience, and a minimum of three years of supervised clinical experience.

c. To satisfy the requirement for instruction in 41.3(5) “*b*” above, the classroom and laboratory training shall include:

- (1) Radiation physics and instrumentation;
- (2) Radiation protection;
- (3) Mathematics pertaining to the use and measurement of ionization radiation; and
- (4) Radiation biology.

d. To satisfy the requirement for supervised work experience in 41.3(4) “*b*” above, training shall be under the supervision of an authorized user and shall include:

- (1) Reviewing the full calibration measurements and periodic quality assurance checks;
- (2) Evaluating prepared treatment plans and calculation of treatment times/patient treatment settings;
- (3) Using administrative controls to prevent misadministrations;
- (4) Implementing emergency procedures to be followed in the event of the abnormal operation of an external beam radiation therapy unit or console; and
- (5) Checking and using radiation survey meters.

e. To satisfy the requirement for a period of supervised clinical experience, training shall include one year in a formal training program approved by the Residency Review Committee for Radiology of the Accreditation Council for Graduate Medical Education or the Committee on Postdoctoral Training of the American Osteopathic Association and an additional two years of clinical experience in therapeutic radiology under the supervision of an authorized user. The supervised clinical experience shall include:

- (1) Examining individuals and reviewing their case histories to determine their suitability for external beam radiation therapy treatment, and any limitations/contraindications;
- (2) Selecting proper dose and how it is to be administered;
- (3) Calculating the external beam radiation therapy doses and collaborating with the authorized user in the review of patients’ progress; consideration of the need to modify originally prescribed doses or treatment plans as warranted by patients’ reaction to radiation; and
- (4) Postadministration follow-up and review of case histories.

f. Notwithstanding the requirements of 41.3(5) “*b*,” the registrant for any therapeutic radiation machine subject to 41.3(17) and 41.3(18) may also submit the training of the prospective authorized user physician for agency review.

g. A physician shall not act as an authorized user for any therapeutic radiation machine until such time as said physician’s training has been reviewed and approved by the registrant.

41.3(6) Training for radiation therapy physicist. The registrant for any therapeutic radiation machine subject to 41.3(17) or (18) shall require the radiation therapy physicist to:

a. Be registered with the agency, under the provisions of 641—subrule 39.3(3) of these regulations, as a provider of radiation services in the area of calibration and compliance surveys of external beam radiation therapy units; and

b. Be certified by the American Board of Radiology in:

- (1) Therapeutic radiological physics; or
- (2) Roentgen-ray and gamma-ray physics; or
- (3) X-ray and radium physics; or
- (4) Radiological physics; or
- (5) Therapeutic medical physics; or
- c.* Be certified by the American Board of Medical Physics in radiation oncology physics; or
- d.* Be certified by the Canadian College of Physicists in Medicine; or
- e.* Hold a master's or doctor's degree in physics, biophysics, radiological physics, or health physics, and have completed one year of full-time training in therapeutic radiological physics and also one year of full-time work experience under the supervision of a radiation therapy physicist at a medical institution. To meet this requirement, the individual shall have performed the tasks listed in 41.3(16)“*a*,” 41.3(17)“*c*” and “*d*,” and 41.3(18)“*e*” and “*f*” under the supervision of a radiation therapy physicist during the year of work experience.

f. Rescinded IAB 4/3/02, effective 5/8/02.

41.3(7) Qualifications of operators. Individuals who will be operating a therapeutic radiation machine for medical use shall be adequately instructed in the safe operating procedures and hold a current permit to practice in radiation therapy as a radiation therapist under the provisions of 641—Chapter 42. The permit holder shall make the permit available at the individual's place of employment. If the permit holder works at more than one facility, a duplicate of the permit shall be kept at each facility.

41.3(8) Written safety procedures and rules shall be developed by a radiation therapy physicist and shall be available in the control area of a therapeutic radiation machine, including any restrictions required for the safe operation of the particular therapeutic radiation machine. The operator shall be able to demonstrate familiarity with these rules. All individuals associated with the operation of a therapeutic radiation machine shall be instructed in and shall comply with procedures for maintaining written directives.

41.3(9) Individuals shall not be exposed to the useful beam except for medical therapy purposes and unless such exposure has been ordered in writing by a physician. This provision specifically prohibits deliberate exposure of an individual for training, demonstration or other non-healing arts purposes.

41.3(10) Records of visiting authorized users. Notwithstanding the provisions of 41.3(5), a registrant may permit any physician to act as a visiting authorized user for up to 60 days per calendar year under the following conditions:

- a.* The visiting authorized user has the prior written permission of the registrant's management and, if the use occurs on behalf of an institution, the institution's radiation safety committee;
- b.* The visiting authorized user meets the requirements of 41.3(5); and
- c.* The registrant maintains copies of all records specified in 41.3(5) for five years from the date of the last visit.

41.3(11) Information and maintenance record and associated information. The registrant shall maintain the following information in a separate file or package for each therapeutic radiation machine for inspection by the agency:

- a.* Report of acceptance testing;
- b.* Records of all surveys, calibrations, and periodic quality assurance checks of the therapeutic radiation machine required by 41.3(136C), as well as the name(s) of person(s) who performed such activities;
- c.* Records of maintenance or modifications, or both, performed on the therapeutic radiation machine after July 9, 1997, as well as the name(s) of person(s) who performed such services;
- d.* Signature of person authorizing the return of therapeutic radiation machine to clinical use after service, repair, or upgrade.
- e.* Records of training specified in 41.3(5) and 41.3(6).

41.3(12) Records retention. All records required by 641—41.3(136C) shall be retained until disposal is authorized by the agency unless another retention period is specifically authorized in 41.3(136C). All required records shall be retained in an active file from at least the time of generation until the next

agency inspection. Any required record generated before the last agency inspection may be microfilmed or otherwise archived as long as a complete copy can be retrieved until such time the agency authorizes final disposal.

41.3(13) Form of records. Rescinded IAB 4/5/00, effective 5/10/00.

41.3(14) Written directives. Each registrant shall meet the following:

a. A written directive must be dated and signed by an authorized user prior to the administration of radiation.

(1) If, because of the patient's condition, a delay in the order to provide a written revision to an existing directive would jeopardize the patient's health, an oral revision to an existing written directive will be acceptable, provided that the oral revision is documented as soon as possible in writing in the patient's record and a revised written directive is signed by an authorized user within 48 hours of the oral revision.

(2) The written directive must contain the patient or human research subject's name, the type and energy of the beam, the total dose, dose per fraction, treatment site, and number of fractions.

(3) A written revision to an existing written directive may be made provided that the revision is dated and signed by an authorized user prior to the administration of the external beam dose, or the next fractional dose.

(4) The registrant shall retain a copy of the written directive for three years.

b. Procedures for administration. The registrant shall have written procedures that provide the following information:

(1) Prior to the administration of each course of radiation treatment, the patient's or human research subject's identity is verified by more than one method as the individual named in the written directive;

(2) Each administration is in accordance with the written directive;

(3) External beam radiation therapy final plans of treatment and related calculations are in accordance with the respective written directives by:

1. Checking both manual and computer-generated dose calculations to verify that they are correct and in accordance with the written directive; and

2. Verifying that any computer-generated calculations are correctly transferred into the consoles of authorized therapeutic medical units;

(4) Any unintended deviation from the written directive is identified, evaluated and appropriate action is taken; and

(5) The registrant retains a copy of the procedures for administrations for the duration of the registration.

41.3(15) Reports and notifications of misadministrations.

a. A registrant shall report any event resulting from intervention of a patient or human research subject in which the administration of external beam radiation results, or will result, in unintended permanent functional damage to an organ or a physiological system as determined by a physician.

b. Other than events that result from intervention by a patient or human research subject, a registrant shall report any event in which the administration of an external beam radiation therapy dose results in:

(1) A dose that differs from the prescribed dose by more than 5 rem (0.05 sievert) effective dose equivalent, 50 rem (0.5 sievert) to an organ or tissue, or 50 rem (0.5 sievert) shallow dose equivalent to the skin, and either:

1. The total dose delivered differs from the prescribed dose by 20 percent or more; or

2. The fractionated dose delivered differs from the prescribed dose for a single fraction by 50 percent or more.

(2) A dose that exceeds 5 rem (0.05 sievert) effective dose equivalent, 50 rem (0.5 sievert) to an organ or tissue, or 50 rem (0.5 sievert) shallow dose equivalent to the skin from either of the following:

1. An administration of the wrong treatment modality;

2. An administration to the wrong individual or human research subject.

(3) A dose to the skin or an organ or tissue other than the treatment site that exceeds by 50 rem (0.5 sievert) to an organ or tissue and 50 percent or more of the dose expected from the administration defined in the written directive.

c. The registrant shall notify the agency by telephone no later than the next calendar day after the discovery of a misadministration.

d. The registrant shall submit a written report to the agency within 15 days after the discovery of a misadministration. The written report shall include:

- (1) The registrant's name;
- (2) The name of the prescribing physician;
- (3) A brief description of the event;
- (4) Why the event occurred;
- (5) The effect, if any, on the individual or individuals who received the misadministration;
- (6) Actions, if any, that have been taken, or are planned, to prevent recurrence;
- (7) Certification that the registrant notified the individual or the individual's responsible relative or guardian, and if not, why not.

e. The report to the agency shall not contain the individual's name or any other information that could lead to the identification of the individual.

f. The registrant shall provide notification of the event to the referring physician and also notify the individual who is the subject of the misadministration no later than 24 hours after its discovery, unless the referring physician personally informs the registrant either that the referring physician will inform the individual or that, based on medical judgment, the physician's telling the individual would be harmful. The registrant is not required to notify the individual without first consulting the referring physician. If the referring physician or the affected individual cannot be reached within 24 hours, the registrant shall notify the individual as soon as possible thereafter. The registrant may not delay any appropriate medical care for the individual, including any necessary remedial care as a result of the misadministration, because of any delay in notification. To meet the requirements of this paragraph, the notification of the individual who is the subject of the misadministration may be made instead to that individual's responsible relative or guardian. If a verbal notification is made, the registrant shall inform the individual, or appropriate responsible relative or guardian, that a written description of the event may be obtained from the registrant upon request. The registrant shall provide such a written description if requested.

g. Aside from the notification requirement, nothing in this subrule affects any rights or duties of registrants and physicians in relation to each other, to individuals affected by the misadministration, or to individuals' responsible relatives or guardians.

h. A copy of the record required in this subrule shall be provided to the referring physician, if other than the registrant, within 15 days after discovery of the misadministration.

i. Records of misadministrations. A registrant shall retain a record of misadministrations reported in this subrule for three years. The record must contain the following:

- (1) The registrant's name and the names of the individuals involved;
- (2) The social security number or other identification number, if one has been assigned, of the individual who is the subject of the misadministration;
- (3) A brief description of the event; why it occurred; and the effect, if any, on the individual;
- (4) The actions, if any, taken or planned to prevent recurrence; and
- (5) Whether the registrant notified the individual or the individual's responsible relative or guardian, and, if not, whether such failure to notify was based on guidance from the referring physician.

41.3(16) General technical requirements for facilities using therapeutic radiation machines.

a. Protection surveys.

(1) The registrant shall ensure that radiation protection surveys of all new facilities, and existing facilities not previously surveyed, are performed with an operable radiation measurement survey instrument calibrated within the past 12 months. The radiation protection survey shall be performed by, or under the direction of, a radiation therapy physicist or a certified health physicist and shall verify

that, with the therapeutic radiation machine in a “BEAM-ON” condition, with the largest clinically available treatment field and with a scattering phantom in the useful beam of radiation:

1. Radiation levels in restricted areas are not likely to cause personnel exposures in excess of the limits specified in 641—subrule 40.15(1); and

2. Radiation levels in unrestricted areas do not exceed the limits specified in 641—paragraphs 40.26(1) “a” and “b.”

(2) In addition to the requirements of 41.3(16) “a”(1), a radiation protection survey shall also be performed prior to any subsequent medical use and:

1. After making any change in the treatment room shielding;

2. After making any change in the location of the therapeutic radiation machine within the treatment room;

3. After relocating the therapeutic radiation machine; or

4. Before using the therapeutic radiation machine in a manner that could result in increased radiation levels in areas outside the external beam radiation therapy treatment room.

(3) The survey record shall indicate all instances where the facility, in the opinion of the radiation therapy physicist or a certified health physicist, is in violation of applicable regulations. The survey record shall also include the date of the measurements, the reason the survey is required, the manufacturer’s name, model number and serial number of the therapeutic radiation machine, the instrument(s) used to measure radiation levels, a plan of the areas surrounding the treatment room that were surveyed, the measured dose rate at several points in each area expressed in microsieverts or millirems per hour, the calculated maximum level of radiation over a period of one week for each restricted and unrestricted area, and the signature of the individual responsible for conducting the survey.

(4) If the results of the surveys required by 41.3(16) “a”(1) or (2) indicate any radiation levels in excess of the respective limit specified in 41.3(16) “a”(1), the registrant shall lock the control in the “OFF” position and not use the unit:

1. Except as may be necessary to repair, replace, or test the therapeutic radiation machine, the therapeutic radiation machine shielding, or the treatment room shielding; or

2. Until the registrant has received a specific exemption in writing from the agency.

b. Modification of radiation therapy unit or room before beginning a treatment program. If the survey required by 41.3(16) “a” indicates that an individual in an unrestricted area may be exposed to levels of radiation greater than those permitted by 641—paragraphs 40.26(1) “a” and “b,” before beginning the treatment program the registrant shall:

(1) Either equip the unit with beam direction interlocks or add additional radiation shielding to ensure compliance with 641—paragraphs 40.26(1) “a” and “b”;

(2) Perform the survey required by 41.3(16) “a” again; and

(3) Include in the report required by 41.3(16) “d” the results of the initial survey, a description of the modification made to comply with 41.3(5) “b”(1), and the results of the second survey; or

(4) Request and receive written authorization from the agency that authorizes radiation levels in unrestricted areas greater than those permitted by 641—paragraphs 40.26(1) “a” and “b.”

c. Dosimetry equipment.

(1) The registrant shall have a calibrated dosimetry system available for use. The system shall have been calibrated by the National Institute for Standards and Technology (NIST) or by an American Association of Physicists in Medicine (AAPM) Accredited Dosimetry Calibration Laboratory (ADCL). The calibration shall have been performed within the previous 24 months and after any servicing that may have affected system calibration.

1. For beams with energies greater than 1 MV (1 MeV), the dosimetry system shall have been calibrated for Cobalt-60.

2. For beams with energies equal to or less than 1 MV (1 MeV), the dosimetry system shall have been calibrated at an energy (energy range) appropriate for the radiation being measured.

(2) The registrant shall have available for use a dosimetry system for quality assurance check measurements. To meet this requirement, the system may be compared with a system that has been

calibrated in accordance with 41.3(16) "c"(1). This comparison shall have been performed within the previous 12 months and after each servicing that may have affected system calibration. The quality assurance check system may be the same system used to meet the requirement in 41.3(16) "c"(1).

(3) The registrant shall maintain a record of each dosimetry system calibration, intercomparison, and comparison for the duration of the license or registration. For each calibration, intercomparison, or comparison, the record shall include the date, the model numbers and serial numbers of the instruments that were calibrated, intercompared, or compared as required by 41.3(16) "c"(1) and (2), the correction factors that were determined, the names of the individuals who performed the calibration, intercomparison, or comparison, and evidence that the intercomparison was performed by, or under the direct supervision and in the physical presence of, a radiation therapy physicist.

d. Reports of external beam radiation therapy surveys and measurements. The registrant for any therapeutic radiation machine subject to 41.3(17) or 41.3(18) shall furnish a copy of the records required in 41.3(16) "a" and "b" to the agency within 30 days following completion of the action that initiated the record requirement.

41.3(17) Therapeutic radiation machines of less than 500 kV.

a. Equipment requirements.

(1) Leakage radiation. When the X-ray tube is operated at its maximum rated tube current for the maximum kV, the leakage air kerma rate shall not exceed the value specified at the distance specified for that classification of therapeutic radiation machine:

1. 5-50 kV systems. The leakage air kerma rate measured at any position 5 centimeters from the tube housing assembly shall not exceed 100 mrad (1 mGy) in any one hour.

2. >50 and <500 kV systems. The leakage air kerma rate measured at a distance of one meter from the target in any direction shall not exceed 1 rad (1 cGy) in any one hour. This air kerma rate measurement may be averaged over areas no larger than 100 square centimeters. In addition, the air kerma rate at a distance of 5 centimeters from the surface of the tube housing assembly shall not exceed 30 rad (30 cGy) per hour.

3. For each therapeutic machine, the registrant shall determine, or obtain from the manufacturer, the leakage radiation existing at positions specified in 41.3(17) "a"(1)"1" and 41.3(17) "a"(1)"2" for the specified operating conditions. Records on leakage radiation measurements shall be maintained at the facility for inspection by the agency.

(2) Permanent beam-limiting devices. Permanent diaphragms or cones used for limiting the useful beam shall provide at least the same degree of attenuation as required for the tube housing assembly.

(3) Adjustable or removable beam-limiting devices.

1. All adjustable or removable beam-limiting devices, diaphragms, cones or blocks shall not transmit more than 5 percent of the useful beam for the most penetrating beam used;

2. When adjustable beam-limiting devices are used, the position and shape of the radiation field shall be indicated by a light beam.

(4) Filter system. The filter system shall be so designed that:

1. Filters cannot be accidentally displaced at any possible tube orientation;

2. For equipment installed after July 9, 1997, an interlock system prevents irradiation if the proper filter is not in place;

3. The air kerma rate escaping from the filter slot shall not exceed 1 rad (1 cGy) per hour at one meter under any operating conditions; and

4. Each filter shall be marked as to its material of construction and its thickness.

(5) Tube immobilization.

1. The X-ray tube shall be so mounted that it cannot accidentally turn or slide with respect to the housing aperture; and

2. The tube housing assembly shall be capable of being immobilized for stationary portal treatments.

(6) Source marking. The tube housing assembly shall be so marked that it is possible to determine the location of the source to within 5 millimeters, and such marking shall be readily accessible for use during calibration procedures.

(7) Beam block. Contact therapy tube housing assemblies shall have a removable shield of material, equivalent in attenuation to 0.5 millimeters of lead at 100 kV, which can be positioned over the entire useful beam exit port during periods when the beam is not in use.

(8) Timer. A suitable irradiation control device shall be provided to terminate the irradiation after a preset time interval.

1. A timer which has a display shall be provided at the treatment control panel. The timer shall have a preset time selector and an elapsed time or time remaining indicator;

2. The timer shall be a cumulative timer which activates with an indication of "BEAM-ON" and retains its reading after irradiation is interrupted or terminated. After irradiation is terminated and before irradiation can be reinitiated, it shall be necessary to reset the elapsed time indicator;

3. The timer shall terminate irradiation when a preselected time has elapsed, if any dose monitoring system present has not previously terminated irradiation;

4. The timer shall permit accurate presetting and determination of exposure times as short as one second;

5. The timer shall not permit an exposure if set at zero;

6. The timer shall not activate until the shutter is opened when irradiation is controlled by a shutter mechanism unless calibration includes a timer error correction to compensate for mechanical lag; and

7. Timer shall be accurate to within 1 percent of the selected value or one second, whichever is greater.

(9) Control panel functions. The control panel, in addition to the displays required by other provisions in 41.3(6), shall have:

1. An indication of whether electrical power is available at the control panel and if activation of the X-ray tube is possible;

2. An indication of whether X-rays are being produced;

3. Means for indicating X-ray tube potential and current;

4. The means for terminating an exposure at any time;

5. A locking device which will prevent unauthorized use of the therapeutic radiation machine; and

6. For therapeutic radiation machines manufactured after July 9, 1997, a positive display of specific filter(s) in the beam.

(10) Multiple tubes. When a control panel may energize more than one X-ray tube:

1. It shall be possible to activate only one X-ray tube at any time;

2. There shall be an indication at the control panel identifying which X-ray tube is activated; and

3. There shall be an indication at the tube housing assembly when that tube is energized.

(11) Target-to-skin distance (TSD). There shall be a means of determining the central axis TSD to within one centimeter and of reproducing this measurement to within two millimeters thereafter.

(12) Shutters. Unless it is possible to bring the X-ray output to the prescribed exposure parameters within five seconds after the X-ray "ON" switch is energized, the beam shall be attenuated by a shutter(s) having a lead equivalency not less than that of the tube housing assembly. In addition, after the unit is at operating parameters, the shutter(s) shall be controlled by the operator from the control panel. An indication of shutter position shall appear at the control panel.

(13) Low filtration X-ray tubes. Each therapeutic radiation machine equipped with a beryllium or other low-filtration window shall be clearly labeled as such upon the tube housing assembly and shall be provided with a permanent warning device on the control panel that is activated when no additional filtration is present, to indicate that the dose rate is very high.

b. Facility design requirements for therapeutic radiation machines capable of operating in the range 50 kV to 500 kV. In addition to shielding adequate to meet requirements of 41.3(19), the treatment room shall meet the following design requirements:

(1) Aural communication. Provision shall be made for continuous two-way aural communication between the patient and the operator at the control panel.

(2) Viewing systems. Provision shall be made to permit continuous observation of the patient during irradiation and the viewing system shall be so located that the operator can observe the patient

from the control panel. The therapeutic radiation machine shall not be used for patient irradiation unless at least one viewing system is operational.

(3) Additional requirements. Treatment rooms which contain a therapeutic radiation machine capable of operating above 150 kV shall meet the following additional requirements:

1. All protective barriers shall be fixed except for entrance doors or beam interceptors;
2. The control panel shall be located outside the treatment room or in a totally enclosed booth, which has a ceiling, inside the room;
3. Interlocks shall be provided such that all entrance doors, including doors to any interior booths, shall be closed before treatment can be initiated or continued. If the radiation beam is interrupted by any door opening, it shall not be possible to restore the machine to operation without closing the door and reinitiating irradiation by manual action at the control panel; and
4. When any door referred to in 41.3(17)“b”(3)“3” is opened while the radiation machine is activated, the air kerma rate at a distance of one meter from the source shall be reduced to less than 1 mGy (100 mrad) per hour.

c. Full calibration measurements.

(1) Full calibration of a therapeutic radiation machine subject to 41.3(17) shall be performed by, or under the direct supervision of, a radiation therapy physicist:

1. Before the first medical use following installation or reinstallation of the therapeutic radiation machine;
 2. At intervals not exceeding one year; and
 3. Before medical use under the following conditions:
 - Whenever quality assurance check measurements indicate that the radiation output differs by more than 5 percent from the value obtained at the last full calibration and the difference cannot be reconciled; and
 - Following any component replacement, major repair, or modification of components that could significantly affect the characteristics of the radiation beam.
 4. Notwithstanding the requirements of 41.3(17)“c”(1):
 - Full calibration of therapeutic radiation machines with multienergy capabilities is required only for those modes or energies that are not within their acceptable range; and
 - If the repair, replacement or modification does not affect all energies, full calibration shall be performed on the affected energy that is in most frequent clinical use at the facility. The remaining energies may be validated with quality assurance check procedures against the criteria in 41.3(17)“b”(3).
- (2) To satisfy the requirement of 41.3(17)“c”(1), full calibration shall include all measurements recommended for annual calibration by NCRP Report 69, “Dosimetry of X-ray and Gamma Ray Beams for Radiation Therapy in the Energy Range 10 keV to 50 MeV” (1981).

(3) The registrant shall maintain a record of each calibration for the duration of the registration. The record shall include the date of the calibration, the manufacturer’s name, model number, and serial number for both the therapeutic radiation machine and the X-ray tube, the model numbers and serial numbers of the instruments used to calibrate the therapeutic radiation machine, and the signature of the radiation therapy physicist responsible for performing the calibration.

d. Periodic quality assurance checks.

(1) Periodic quality assurance checks shall be performed on therapeutic radiation machines, subject to 41.3(17), which are capable of operation at greater than or equal to 50 kV.

(2) To satisfy the requirement of 41.3(17)“d”(1), quality assurance checks shall meet the following requirements:

1. The registrant shall perform quality assurance checks in accordance with written procedures established by the radiation therapy physicist; and
2. The quality assurance check procedures shall specify the frequency at which tests or measurements are to be performed. The quality assurance check procedures shall specify that the quality assurance check shall be performed during the calibration specified in 41.3(17)“c”(1). The acceptable tolerance for each parameter measured in the quality assurance check, when compared to the value for that parameter determined in the calibration specified in 41.3(17)“c”(1), shall be stated.

(3) The cause for a parameter exceeding a tolerance set by the radiation therapy physicist shall be investigated and corrected before the system is used for patient or human research subject irradiation;

(4) Whenever a quality assurance check indicates a significant change in the operating characteristics of a system, as specified in the radiation therapy physicist's quality assurance check procedures, the system shall be recalibrated as required in 41.3(17) "c"(1);

(5) The registrant shall use the dosimetry system described in 41.3(16) "c"(2) to make the quality assurance check required in 41.3(17) "d";

(6) The registrant shall have the radiation therapy physicist review and sign the results of each radiation output quality assurance check within one month of test completion;

(7) The registrant shall ensure that safety quality assurance checks of therapeutic radiation machines subject to 41.3(17) are performed at intervals not to exceed one month;

(8) Notwithstanding the requirements of 41.3(17) "d"(6) and (7), the registrant shall ensure that no therapeutic radiation machine is used to administer radiation to humans unless the quality assurance checks required by 41.3(17) "d"(6) and (7) have been performed within the 30 days prior to administration;

(9) To satisfy the requirement of 41.3(17) "d"(7), safety quality assurance checks shall ensure proper operation of:

1. Electrical interlocks at each external beam radiation therapy room entrance;
2. The "BEAM-ON" and termination switches;
3. Beam condition indicator lights on the access door(s), control console, and in the radiation therapy room;
4. Viewing systems;
5. If applicable, electrically operated treatment room doors from inside and outside the treatment room.

(10) The registrant shall maintain a record of each quality assurance check required by 41.3(17) "d"(1) and (7) for three years. The record shall include the date of the quality assurance check, the manufacturer's name, model number, and serial number for the therapeutic radiation machine, the manufacturer's name, model number and serial number of the instrument(s) used to measure the radiation output of the therapeutic radiation machine, and the signature of the individual who performed the periodic quality assurance check.

e. Operating procedures.

(1) Therapeutic radiation machines shall not be left unattended unless secured by means identified in 41.3(17) "a"(9) "5";

(2) When a patient must be held in position for radiation therapy, mechanical supporting or restraining devices shall be used;

(3) The tube housing assembly shall not be held by an individual during operation unless the assembly is designed to require such holding and the peak tube potential of the system does not exceed 50 kV. In such cases, the holder shall wear protective gloves and apron of not less than 0.5 millimeters lead equivalency at 100 kV;

(4) A copy of the current operating and emergency procedures shall be maintained at the therapeutic radiation machine control console; and

(5) No individual other than the patient shall be in the treatment room during exposures from therapeutic radiation machines operating above 150 kV. At energies less than or equal to 150 kV, any individual, other than the patient, in the treatment room shall be protected by a barrier sufficient to meet the requirements of 641—40.26(136C).

(6) The therapeutic radiation machine shall not be used for irradiation of patients unless the requirements of 41.3(17) "c" and "d" have been met.

f. Possession of survey instrument(s). Each facility location authorized to use a therapeutic radiation machine in accordance with 41.3(17) shall have at its disposal appropriately calibrated portable monitoring equipment. As a minimum, such equipment shall include a portable radiation measurement survey instrument capable of measuring dose rates over the range 1 mrem (10 μ Sv) per

hour to 1000 mrem (10 mSv) per hour. The survey instrument(s) shall be operable and calibrated at intervals not to exceed 12 months for the radiation measured.

41.3(18) Therapeutic radiation machines—photon therapy systems (500 kV and above) and electron therapy systems (500 keV and above).

a. Equipment requirements.

(1) Leakage radiation outside the maximum useful beam in photon and electron modes.

1. The absorbed dose due to leakage radiation (excluding neutrons) at any point outside the maximum-sized useful beam, but within a circular plane of radius two meters which is perpendicular to and centered on the central axis of the useful beam at the nominal treatment distance (i.e., patient plane), shall not exceed a maximum of 0.2 percent and an average of 0.1 percent of the absorbed dose on the central axis of the beam at the nominal treatment distance. Measurements shall be averaged over an area not exceeding 100 square centimeters at a minimum of 16 points uniformly distributed in the plane;

2. Except for the area defined in 41.3(18)“a”(1)“1,” the absorbed dose due to leakage radiation (excluding neutrons) at one meter from the electron path between the electron source and the target or electron window shall not exceed 0.5 percent of the absorbed dose on the central axis of the beam at the nominal treatment distance. Measurements shall be averaged over an area not exceeding 100 square centimeters;

3. For equipment manufactured after July 9, 1997, the neutron absorbed dose outside the useful beam shall be in compliance with International Electrotechnical Agency (IEC) Document 601-2-1 (most current revision); and

4. For each therapeutic radiation machine, the registrant shall determine, or obtain from the manufacturer, the leakage radiation existing at the positions specified in 41.3(18)“a”(1)“1” to “3” for the specified operating conditions. Records of leakage radiation measurements shall be maintained for inspection by the agency.

(2) Leakage radiation through beam-limiting devices.

1. Photon radiation. All adjustable or interchangeable beam-limiting devices shall attenuate the useful beam such that at the nominal treatment distance, the maximum absorbed dose anywhere in the area shielded by the beam-limiting device(s) shall not exceed 2 percent of the maximum absorbed dose on the central axis of the useful beam measured in a 10-centimeter by 10-centimeter radiation field;

2. Electron radiation. All adjustable or interchangeable electron applicators shall attenuate the radiation including, but not limited to, photon radiation generated by electrons incident on the beam-limiting device and electron applicator and other parts of the radiation head, such that the absorbed dose in a plane perpendicular to the central axis of the useful beam at the nominal treatment distance shall not exceed:

- A maximum of 2 percent and average of 0.5 percent of the absorbed dose on the central axis of the useful beam at the nominal treatment distance. This limit shall apply beyond a line seven centimeters outside the periphery of the useful beam; and

- A maximum of 10 percent of the absorbed dose on the central axis of the useful beam at the nominal treatment distance. This limit shall apply beyond a line two centimeters outside the periphery of the useful beam.

(3) Measurement of leakage radiation.

1. Photon radiation. Measurements of leakage radiation through the beam-limiting devices shall be made with the beam-limiting devices closed and any residual aperture blocked by at least two-tenth value layers of suitable absorbing material. In the case of overlapping beam-limiting devices, the leakage radiation through each set shall be measured independently at the depth of maximum dose. Measurements shall be made using a radiation detector with an area not exceeding ten square centimeters;

2. Electron radiation. Measurements of leakage radiation through the electron applicators shall be made with the electron beam directed into the air and using a radiation detector with an area up to but not exceeding one square centimeter suitably protected against radiation which has been scattered from material beyond the radiation detector. Measurements shall be made using one centimeter of water equivalent buildup material.

(4) Filters/wedges.

1. Each wedge filter which is removable from the system shall be clearly marked with an identification number. For removable wedge filters, the nominal wedge angle shall appear on the wedge or wedge tray (if permanently mounted to the tray). If the wedge or wedge tray is significantly damaged, the wedge transmission factor shall be redetermined;

2. If the absorbed dose rate information required by 41.3(18)“a”(9) relates exclusively to operation with a field-flattening filter or beam-scattering foil in place, such filter or foil shall be removable only by the use of tools;

3. For equipment manufactured after July 9, 1997, which utilizes a system of wedge filters, interchangeable field-flattening filters, or interchangeable beam-scattering foils:

- Irradiation shall not be possible until a selection of a filter or a positive selection to use “no filter” has been made at the treatment control panel, either manually or automatically;

- An interlock system shall be provided to prevent irradiation if the filter selected is not in the correct position;

- A display shall be provided at the treatment control panel showing the wedge filter(s), interchangeable field-flattening filter(s), and interchangeable beam-scattering foil(s) in use; and

- An interlock shall be provided to prevent irradiation if any filter or beam-scattering foil selection operation carried out in the treatment room does not agree with the filter or beam-scattering foil selection operation carried out at the treatment control panel.

(5) Stray radiation in the useful beam. For equipment manufactured after July 9, 1997, the registrant shall determine during acceptance testing, or obtain from the manufacturer, data sufficient to ensure that X-ray stray radiation in the useful electron beam, absorbed dose at the surface during X-ray irradiation and stray neutron radiation in the useful X-ray beam are in compliance with International Electrotechnical Agency (IEC) Document 601-2-1 (most current revision).

(6) Beam monitors. All therapeutic radiation machines subject to 41.3(18) shall be provided with redundant beam monitoring systems. The sensors for these systems shall be fixed in the useful beam during treatment to indicate the dose monitor unit rate.

1. Equipment manufactured after July 9, 1997, shall be provided with at least two independently powered integrating dose meters. Alternatively, common elements may be used if the production of radiation is terminated upon failure of any common element.

2. Equipment manufactured on or before July 9, 1997, shall be provided with at least one radiation detector. This detector shall be incorporated into a useful beam monitoring system. The detector and the system into which that detector is incorporated shall meet the following requirements:

- Each detector shall be removable only with tools and, if movable, shall be interlocked to prevent incorrect positioning;

- Each detector shall form part of a beam monitoring system from whose readings in dose monitor units the absorbed dose at a reference point can be calculated;

- Each beam monitoring system shall be capable of independently monitoring, interrupting, and terminating irradiation; and

3. For equipment manufactured after July 9, 1997, the design of the beam monitoring systems shall ensure that the:

- Malfunctioning of one system shall not affect the correct functioning of the other system(s); and

- Failure of any element common to both systems which could affect the correct function of both systems shall terminate irradiation or prevent the initiation of radiation.

4. Each beam monitoring system shall have a legible display at the treatment control panel. For equipment manufactured after July 9, 1997, each display shall:

- Maintain a reading until intentionally reset;

- Have only one scale and no electrical or mechanical scale multiplying factors;

- Utilize a design such that increasing dose is displayed by increasing numbers; and

- In the event of power failure, the beam monitoring information required in 41.3(18)“a”(6)“4” displayed at the control panel at the time of failure shall be retrievable in at least one system for a 20-minute period of time.

(7) Beam symmetry.

1. Bent-beam linear accelerators with beam-flattening filter(s) subject to 41.3(18) shall be provided with auxiliary device(s) to monitor beam symmetry;

2. The device(s) referenced in 41.3(18)“a”(7)“1” shall be able to detect field asymmetry greater than 10 percent, and shall be configured to terminate irradiation if field asymmetry cannot be maintained at 10 percent or less.

(8) Selection and display of dose monitor units.

1. The preselected number of dose monitor units shall be displayed at the treatment control panel until reset manually;

2. After termination of irradiation, it shall be necessary to reset the dosimeter display before subsequent treatment can be initiated; and

3. For equipment manufactured after July 9, 1997, after termination of irradiation, it shall be necessary for the operator to reset the preselected dose monitor units before irradiation can be initiated.

4. Irradiation shall not be possible until a new selection of a number of dose monitor units has been made at the treatment control panel.

(9) Air kerma rate/absorbed dose rate. For equipment manufactured after July 9, 1997, a system shall be provided from whose readings the air kerma rate or absorbed dose rate at a reference point can be calculated. (The radiation detectors specified in 41.3(18)“a”(6) may form part of this system.) In addition:

1. The dose monitor unit rate shall be displayed at the treatment control panel;

2. If the equipment can deliver under any conditions an air kerma rate or absorbed dose rate at the nominal treatment distance more than twice the maximum value specified by the manufacturer, a device shall be provided which terminates irradiation when the air kerma rate or absorbed dose rate exceeds a value twice the specified maximum. The dose rate at which the irradiation will be terminated shall be a record maintained by the registrant;

3. If the equipment can deliver under any fault condition(s) an air kerma rate or absorbed dose rate at the nominal treatment distance more than ten times the maximum value specified by the manufacturer, a device shall be provided to prevent the air kerma rate or absorbed dose rate anywhere in the radiation field from exceeding twice the specified maximum value and to terminate irradiation if the excess absorbed dose at the nominal treatment distance exceeds 400 rad (4 Gy); and

4. For each therapeutic radiation machine, the registrant shall determine, or obtain from the manufacturer, the maximum value(s) specified in 41.3(18)“a”(7)“2” and “3” for the specified operating conditions. Records of these maximum value(s) shall be maintained at the installation for inspection by the agency.

(10) Termination of irradiation by the beam monitoring system or systems during stationary beam radiation therapy.

1. Each primary system shall terminate irradiation when the preselected number of dose monitor units has been detected by the system;

2. If the original design of the equipment included a secondary dose monitoring system, that system shall be capable of terminating irradiation when not more than 15 percent or 40 dose monitor units above the preselected number of dose monitor units set at the control panel has been detected by the secondary dose monitoring system; and

3. For equipment manufactured after July 9, 1997, an indicator on the control panel shall show which monitoring system has terminated irradiation.

(11) Termination switches. It shall be possible to terminate irradiation and equipment movement or go from an interruption condition to termination condition at any time from the operator’s position at the treatment control panel.

(12) Interruption switches. If a therapeutic radiation machine has an interrupt mode, it shall be possible to interrupt irradiation and equipment movements at any time from the treatment control

panel. Following an interruption it shall be possible to restart irradiation by operator action without any reselection of operating conditions. If any change of a preselected value is made during an interruption, irradiation and equipment movements shall be automatically terminated.

(13) Timer. A suitable irradiation control device shall be provided to terminate the irradiation after a preset time interval.

1. A timer shall be provided which has a display at the treatment control panel. The timer shall have a preset time selector and an elapsed time indicator;

2. The timer shall be a cumulative timer which activates with an indication of "BEAM-ON" and retains its reading after irradiation is interrupted or terminated. After irradiation is terminated and before irradiation can be reinitiated, it shall be necessary to reset the elapsed time indicator;

3. The timer shall terminate irradiation when a preselected time has elapsed, if the dose monitoring systems have not previously terminated irradiation.

(14) Selection of radiation type. Equipment capable of both X-ray therapy and electron therapy shall meet the following additional requirements:

1. Irradiation shall not be possible until a selection of radiation type (X-rays or electrons) has been made at the treatment control panel;

2. The radiation type selected shall be displayed at the treatment control panel before and during irradiation;

3. An interlock system shall be provided to ensure that the equipment can principally emit only the radiation type which has been selected;

4. An interlock system shall be provided to prevent irradiation with X-rays, except to obtain a verification image, when electron applicators are fitted;

5. An interlock system shall be provided to prevent irradiation with electrons when accessories specific for X-ray therapy are fitted; and

6. An interlock system shall be provided to prevent irradiation if any selected operations carried out in the treatment room do not agree with the selected operations carried out at the treatment control panel.

(15) Selection of energy. Equipment capable of generating radiation beams of different energies shall meet the following requirements:

1. Irradiation shall not be possible until a selection of energy has been made at the treatment control panel;

2. The nominal energy value selected shall be displayed at the treatment control panel until reset manually for the next irradiation. After termination of irradiation, it shall be necessary to reset the nominal energy value selected before subsequent treatment can be initiated; and

3. Irradiation shall not be possible until the appropriate flattening filter or scattering foil for the selected energy is in its proper location.

4. For equipment manufactured after July 9, 1997, the selection of energy shall be in compliance with International Electrotechnical Commission (IEC) Document 60601-2-1.

(16) Selection of stationary beam radiation therapy or moving beam radiation therapy. Therapeutic radiation machines capable of both stationary beam radiation therapy and moving beam radiation therapy shall meet the following requirements:

1. Irradiation shall not be possible until a selection of stationary beam radiation therapy or moving beam radiation therapy has been made at the treatment control panel;

2. The mode of operation shall be displayed at the treatment control panel;

3. An interlock system shall be provided to ensure that the equipment can operate only in the mode which has been selected;

4. An interlock system shall be provided to prevent irradiation if any selected parameter in the treatment room does not agree with the selected parameter at the treatment control panel;

5. Moving beam radiation therapy shall be controlled to obtain the selected relationships between incremental dose monitor units and incremental movement. For equipment manufactured after July 9, 1997:

- An interlock system shall be provided to terminate irradiation if the number of dose monitor units delivered in any ten degrees of rotation or one centimeter of linear motion differs by more than 20 percent from the selected value;

- Where angle terminates the irradiation in moving beam radiation therapy, the dose monitor units delivered shall differ by less than 5 percent from the dose monitor unit value selected;

- An interlock shall be provided to prevent motion of more than five degrees or one centimeter beyond the selected limits during moving beam radiation therapy;

- An interlock shall be provided to require that a selection of direction be made at the treatment control panel in all units which are capable of both clockwise and counterclockwise moving beam radiation therapy.

- Moving beam radiation therapy shall be controlled with both primary position sensors and secondary position sensors to obtain the selected relationships between incremental dose monitor units and incremental movement.

6. Where the beam monitoring system terminates the irradiation in moving beam radiation therapy, the termination of irradiation shall be as required by 41.3(18)“a”(10); and

7. For equipment manufactured after July 9, 1997, an interlock system shall be provided to terminate irradiation if movement:

- Occurs during stationary beam radiation therapy; or

- Does not start or stops during moving beam radiation therapy unless such stoppage is a preplanned function.

b. Facility design requirements for therapeutic radiation machines operating above 500 kV. In addition to shielding adequate to meet requirements of 41.3(19), the following design requirements are made:

(1) Protective barriers. All protective barriers shall be fixed, except for access doors to the treatment room or movable beam interceptors.

(2) Control panel. In addition to other requirements specified in 41.3(136C), the control panel shall also:

1. Be located outside the treatment room;

2. Provide an indication of whether electrical power is available at the control panel and if activation of the radiation is possible;

3. Provide an indication of whether radiation is being produced; and

4. Include an access control (locking) device which will prevent unauthorized use of the therapeutic radiation machine.

(3) Viewing systems. Windows, mirrors, closed-circuit television or an equivalent viewing system shall be provided to permit continuous observation of the patient following positioning and during irradiation and shall be so located that the operator may observe the patient from the treatment control panel. The therapeutic radiation machine shall not be used for patient irradiation unless at least one viewing system is operational.

(4) Aural communications. Provision shall be made for continuous two-way aural communication between the patient and the operator at the control panel. The therapeutic radiation machine shall not be used for irradiation of patients unless continuous two-way aural communication is possible.

(5) Room entrances. Treatment room entrances shall be provided with warning lights in a readily observable position near the outside of all access doors, which will indicate when the useful beam is “ON” and when it is “OFF”.

(6) Entrance interlocks. Interlocks shall be provided such that all access controls are activated before treatment can be initiated or continued. If the radiation beam is interrupted by any access control, it shall not be possible to restore the machine to operation without resetting the access control and reinitiating irradiation by manual action at the control panel.

(7) Beam interceptor interlocks. If the shielding material in any protective barrier requires the presence of a beam interceptor to ensure compliance with 641—paragraphs 40.26(1)“a” and “b,” interlocks shall be provided to prevent the production of radiation, unless the beam interceptor is in place, whenever the useful beam is directed at the designated barrier(s).

(8) Emergency cutoff switches. At least one emergency power cutoff switch shall be located in the radiation therapy room and shall terminate all equipment electrical power including radiation and mechanical motion. This switch is in addition to the termination switch required by 41.3(18)“a”(11). All emergency power cutoff switches shall include a manual reset so that the therapeutic radiation machine cannot be restarted from the unit’s control console without resetting the emergency cutoff switch.

(9) Safety interlocks. All safety interlocks shall be designed so that any defect or component failure in the safety interlock system prevents or terminates operation of the therapeutic radiation machine.

(10) Surveys for residual radiation. Surveys for residual activity shall be conducted on all therapeutic radiation machines capable of generating photon and electron energies above 10 MV prior to machining, removing, or working on therapeutic radiation machine components which may have become activated due to photoneutron production.

(11) Possession of survey instrument(s). Each facility location authorized to use a therapeutic radiation machine in accordance with 41.3(18) shall have at its disposal appropriately calibrated portable monitoring equipment. As a minimum, such equipment shall include a portable radiation measurement survey instrument capable of measuring dose rates over the range 1 mrem (10 μ Sv) per hour to 1000 mrem (10 mSv) per hour. The survey instrument(s) shall be operable and calibrated at intervals not to exceed 12 months for the radiation measured.

c. Radiation therapy physicist support.

(1) The services of a radiation therapy physicist shall be required in facilities having therapeutic radiation machines with energies of 500 kV and above. The radiation therapy physicist shall be responsible for:

1. Full calibration(s) required by 41.3(18)“e” and protection surveys required by 41.3(16)“a”;
2. Supervision and review of dosimetry;
3. Beam data acquisition and transfer for computerized dosimetry, and supervision of its use;
4. Quality assurance, including quality assurance check review required by 41.3(18)“f”(5) of these regulations;
5. Consultation with the authorized user in treatment planning, as needed; and
6. Performing calculations/assessments regarding misadministrations.

(2) If the radiation therapy physicist is not a full-time employee of the registrant, the operating procedures required by 41.3(18)“d” shall also specifically address how the radiation therapy physicist is to be contacted for problems or emergencies, as well as the specific actions, if any, to be taken until the radiation therapy physicist can be contacted.

d. Operating procedures.

(1) No individual, other than the patient, shall be in the treatment room during treatment or during any irradiation for testing or calibration purposes;

(2) Therapeutic radiation machines shall not be made available for medical use unless the requirements of 41.3(16)“a,” 41.3(18)“e,” and 41.3(18)“f” have been met;

(3) Therapeutic radiation machines, when not in operation, shall be secured to prevent unauthorized use;

(4) When adjustable beam-limiting devices are used, the position and shape of the radiation field shall be indicated by a light field;

(5) If a patient must be held in position during treatment, mechanical supporting or restraining devices shall be used; and

(6) A copy of the current operating and emergency procedures shall be maintained at the therapeutic radiation machine control console.

e. Acceptance testing, commissioning, and full calibration measurements.

(1) Acceptance testing, commissioning, and full calibration of a therapeutic radiation machine subject to 41.3(18) shall be performed by, or under the direct supervision of, a radiation therapy physicist:

1. Acceptance testing and commissioning shall be performed in accordance with “AAPM Code of Practice for Radiotherapy Accelerators: AAPM Report No. 47,” prepared by Radiation Therapy Task Group 45, and the manufacturer’s contractual specifications and shall be conducted before the first medical use following installation or reinstallation of the therapeutic radiation machine;

2. Full calibration shall include measurement of all parameters listed in Appendix D of 641—Chapter 41 and shall be performed in accordance with “AAPM Code of Practice for Radiotherapy Accelerators: AAPM Report No. 47,” prepared by Radiation Therapy Task Group 45. Although it shall not be necessary to complete all elements of a full calibration at the same time, all parameters (for all energies) shall be completed at intervals not to exceed 12 calendar months, unless a more frequent interval is required by this agency.

3. The radiation therapy physicist shall perform all elements of a full calibration necessary to determine that all parameters are within acceptable limits:

- Whenever quality assurance check measurements indicate that the radiation output differs by more than 5 percent from the value obtained at the last full calibration and the difference cannot be reconciled. Therapeutic radiation machines with multienergy or multimode capabilities or both shall only require measurements for those modes or energies that are not within their acceptable range; and

- Following any component replacement, major repair, or modification of components that could significantly affect the characteristics of the radiation beam. If the repair, replacement or modification does not affect all modes or energies, measurements shall be performed on the affected mode/energy that is in most frequent clinical use at the facility. The remaining energies/modes may be validated with quality assurance check procedures against the criteria in 41.3(18)“e”(1)“3.”

(2) The registrant shall use the dosimetry system described in 41.3(16)“c” to measure the radiation output for one set of exposure conditions.

(3) The registrant shall maintain a record of each calibration in an auditable form for the duration of the registration. The record shall include the date of the calibration, the manufacturer’s name, model number, and serial number for the therapeutic radiation machine, the model numbers and serial numbers of the instruments used to calibrate the therapeutic radiation machine, and the signature of the radiation therapy physicist responsible for performing the calibration.

f. Periodic quality assurance checks.

(1) Periodic quality assurance checks shall be performed on all therapeutic radiation machines subject to 41.3(18) at intervals as specified in Appendix D of 641—Chapter 41;

(2) To satisfy the requirement of 41.3(18)“f”(1), quality assurance checks shall include determination of central axis radiation output and a representative sampling of periodic quality assurance checks contained in Appendix D of 641—Chapter 41. Representative sampling shall include all referenced periodic quality assurance checks at intervals not to exceed 12 consecutive calendar months;

(3) The registrant shall use a dosimetry system which has been intercompared within the previous 12 months with the dosimetry system described in 41.3(16)“c”(1) to make the periodic quality assurance checks required in 41.3(18)“f”(2);

(4) The registrant shall perform periodic quality assurance checks required by 41.3(18)“f”(1) in accordance with procedures established by the radiation therapy physicist;

(5) The registrant shall review the results of each periodic radiation output check according to the following procedures:

1. The authorized user and radiation therapy physicist shall be immediately notified if any parameter is not within its acceptable tolerance. The therapeutic radiation machine shall not be made available for subsequent medical use until the radiation therapy physicist has determined that all parameters are within their acceptable tolerances;

2. If all quality assurance check parameters appear to be within their acceptable range, the quality assurance check shall be reviewed and signed by either the authorized user or radiation therapy physicist within three treatment days; and

3. The radiation therapy physicist shall review and sign the results of each radiation output quality assurance check at intervals not to exceed one month.

- (6) Therapeutic radiation machines subject to 41.3(18) shall have safety quality assurance checks of each external beam radiation therapy machine performed at intervals not to exceed one week or at longer intervals as recommended by the manufacturer;

(7) To satisfy the requirement of 41.3(18)“f”(6), safety quality assurance checks shall ensure proper operation of:

1. Electrical interlocks at each external beam radiation therapy room entrance;
 2. Proper operation of the “BEAM-ON,” interrupt and termination switches;
 3. Beam condition indicator lights on the access doors, control console, and in the radiation therapy room;
 4. Viewing systems;
 5. Aural systems;
 6. Electrically operated treatment room door(s) from inside and outside the treatment room;
 7. At least one emergency power cutoff switch. If more than one emergency power cutoff switch is installed and not all switches are tested at once, each switch shall be tested on a rotating basis. Safety quality assurance checks of the emergency power cutoff switches may be conducted at the end of the treatment day in order to minimize possible stability problems with the therapeutic radiation machine;
- (8) Rescinded IAB 4/11/07, effective 5/16/07.

(9) The registrant shall promptly repair any system identified in 41.3(18)“f”(7) that is not operating properly; and

(10) The registrant shall maintain a record of each quality assurance check required by 41.3(18)“f”(1) and 41.3(18)“f”(7) for three years. The record shall include the date of the quality assurance check, the manufacturer’s name, model number, and serial number for the therapeutic radiation machine, the manufacturer’s name, model number and serial number of the instrument(s) used to measure the radiation output of the therapeutic radiation machine, and the signature of the individual who performed the periodic quality assurance check.

41.3(19) Shielding and safety design requirements.

a. Each therapeutic radiation machine subject to 41.3(17) or 41.3(18) shall be provided with such primary or secondary barriers as are necessary to ensure compliance with 641—40.15(136C) and 641—40.26(136C).

b. Facility design information for all new installations of a therapeutic radiation machine or installations of a therapeutic radiation machine of higher energy into a room not previously approved for that energy shall be submitted for agency approval prior to actual installation of the therapeutic radiation machine. The minimum facility design information that must be submitted is contained in Appendix E of 641—Chapter 41.

41.3(20) Calibration of survey instruments.

a. The registrant shall ensure that the survey instruments used to show compliance with 645—41.3(136C) have been calibrated before first use, at intervals not to exceed 12 months, and following repair.

b. To satisfy the requirements of 41.3(20), the registrant shall:

- (1) Calibrate all required scale readings up to 1000 mrem (10 mSv) per hour with an appropriate radiation source that is traceable to the National Institute of Standards and Technology (NIST);
- (2) Calibrate at least two points on each scale to be calibrated. These points should be at approximately 1/3 and 2/3 of full scale;
- (3) Consider a point as calibrated if the indicated dose rate differs from the calculated dose rate by not more than 10 percent; and
- (4) Consider a point as calibrated if the indicated dose rate differs from the calculated dose rate by not more than 20 percent if a correction factor or graph is conspicuously attached to the instrument.

c. The registrant shall retain a record of each calibration required in 41.3(20) for three years. The record shall include:

- (1) A description of the calibration procedure; and
- (2) A description of the source used and the certified dose rates from the source, and the rates indicated by the instrument being calibrated, the correction factors deduced from the calibration data, the signature of the individual who performed the calibration, and the date of calibration.

d. The registrant may obtain the services of individuals licensed by this agency, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state to perform calibrations of survey

instruments. Records of calibrations that contain information required in 41.3(20) shall be maintained by the registrant.

[ARC 0577C, IAB 2/6/13, effective 3/13/13; ARC 1639C, IAB 10/1/14, effective 11/5/14]

641—41.4(136C) Radiation safety requirements for analytical X-ray equipment. Rescinded IAB 4/8/98, effective 7/1/98.

641—41.5(136C) Radiation safety requirements for wireline service operations and subsurface tracer studies. Rescinded IAB 4/8/98, effective 7/1/98.

641—41.6(136C) X-ray machines used for screening and diagnostic mammography.

41.6(1) Definitions. In addition to the definitions provided in 641—38.2(136C), 641—40.2(136C), and 641—41.1(136C), the following definitions shall be applicable to this rule.

“*Accreditation body*” means an entity that has been approved by FDA to accredit mammography facilities.

“*Action limits*” or “*action levels*” means the minimum and maximum values of a quality assurance measurement that can be interpreted as representing acceptable performance with respect to the parameter being tested. Values less than the minimum or greater than the maximum action limit or level indicate that corrective action must be taken by the facility. Action limits or levels are also sometimes called control limits or levels.

“*Adverse event*” means an undesirable experience associated with mammography activities. Adverse events include but are not limited to:

1. Poor image quality;
2. Failure to send mammography reports within 30 days to the referring physician or in a timely manner to the self-referred patient; and
3. Use of personnel who do not meet the applicable requirements of this chapter.

“*Air kerma*” means kerma in a given mass of air. The unit used to measure the quantity of air kerma is the Gray (Gy). For X-rays with energies less than 300 kiloelectronvolts (keV), 1 Gray of absorbed dose is delivered by 114 roentgens (R) of exposure.

“*Annually*” means within 10 to 14 months of previous occurrence.

“*Artifact*” means a substance or structure not naturally present in living tissue but of which an authentic image appears in a radiograph.

“*Automatic exposure control systems*” means automatic exposure control systems, often referred to as phototimers, which are designed to automatically determine and provide the exposure needed to produce an adequate density image by sampling the X-ray intensity after passage through the patient and image receptor.

“*Average glandular dose*” means the energy deposited per unit mass of glandular tissue averaged over all the glandular tissue in the breast, calculated from values of entrance exposure in air, the X-ray beam quality (half-value layer), and compressed breast thickness. For a 50 percent-50 percent adipose and glandular 4.2 centimeter breast, the average glandular dose shall not exceed 300 millirad (3 mGy). See also: “Dose.”

“*Breast implant*” means a prosthetic device implanted in the breast.

“*Calendar quarter*” means any one of the following time periods during a given year: January 1 through March 31, April 1 through June 30, July 1 through September 30, or October 1 through December 31.

“*Category 1*” means medical education activities that have been designated as Category 1 by the Accreditation Council for Continuing Medical Education (ACCME), the American Osteopathic Association (AOA), a state medical society, or an equivalent organization.

“*Certificate*” means the certificate described in 41.6(2)“a”(2).

“*Certification*” means the process of approval of a facility by the FDA or this agency to provide mammography services.

“*Clinical image*” means a mammogram.

“*Compression device*” means a firm plastic paddle used to help hold the breast stationary and eliminate blurring due to motion, to help separate structures within the breast, and to decrease the thickness of breast tissue, minimizing the amount of radiation used and the amount of scattered radiation reaching the film.

“*Computed radiography mammography*” means a type of digital mammography in which the digital image receptor must be removed from the X-ray unit for the image to be read and processed by a separate image receptor reader.

“*Consumer*” means an individual who chooses to comment or complain in reference to a mammography examination, including the patient or representative of the patient (e.g., family member or referring physician).

“*Contact hour*” means an hour of training received through direct instruction.

“*Continuing education unit*” or “*continuing education credit*” means one contact hour of training.

“*Craniocaudal view*” means one of two routine views for mammography. The detector system is placed caudad to (below) the breast and the vertical X-ray beam is directed from cranial to caudad (downward) through the breast.

“*Dedicated mammography equipment*” means X-ray systems designed specifically for breast imaging, providing optimum imaging geometry, a device for breast compression and low dose exposure that can generate reproducible images of high quality.

“*Direct detector technology*” means a digital mammogram captured using a material which converts the X-ray energies directly to an electric signal.

“*Direct instruction*” means:

1. Face-to-face interaction between instructor(s) and student(s), as when the instructor provides a lecture, conducts demonstrations, or reviews student performance; or
2. The administration and correction of student examinations by an instructor(s) with subsequent feedback to the student(s).

“*Direct supervision*” means that:

1. During joint interpretation of mammograms, the supervising interpreting physician reviews, discusses, and confirms the diagnosis of the physician being supervised and signs the resulting report before it is entered into the patient’s records; or
2. During the performance of a mammography examination or survey of the facility’s equipment and quality assurance program, the supervisor is present to observe and correct, as needed, the performance of the individual being supervised who is performing the examination or conducting the survey.

“*Dose*” means the amount of energy deposited per unit mass of tissue due to X-radiation. The newer unit of absorbed dose is the Gray: 1 Gray=1 Joule of energy deposited per kilogram of tissue. The older unit of absorbed dose is the rad: 1 rad=0.01 Gray, 1 centiGray, or 10 milliGray.

“*Exposure*” means the amount of X-radiation, quantitated by measuring the amount of ionization in air caused by the radiation. The units of exposure are Coulombs of charge ionized per kilogram of air. The older unit of exposure is the Roentgen: 1 Roentgen= $2.58 \times 10E-4$ Coulombs of charge per kilogram of air.

“*Facility*” means a hospital, outpatient department, clinic, radiology practice, mobile unit, office of a physician, or other facility that conducts mammography activities, including the following: operation of equipment to produce a mammogram, initial interpretation of the mammogram, and maintaining viewing conditions for that interpretation. This term does not include a facility of the Department of Veterans Affairs.

“*FDA*” means the Food and Drug Administration.

“*First allowable time*” means the earliest time a resident physician is eligible to take the diagnostic radiology boards from an FDA-designated certifying body. The “first allowable time” may vary with the certifying body.

“*Full field digital mammography*” means radiographic imaging of the breast using a digital image receptor with minimum dimensions of 18×23 cm to allow imaging the average size breast in a single exposure.

“*Grids*” means a set of thin lead strips spaced close to one another, interspaced by carbon fiber for mammographic grids. The grid is placed between the breast and the screen-film image receptor to reduce scattered radiation reaching the image receptor.

“*Image noise.*” See “Radiographic noise.”

“*Image receptor support device*” means, for mammography X-ray systems, that part of the system designed to support the image receptor during a mammographic examination and to provide a primary protective barrier.

“*Interpreting physician*” means a licensed radiologist who interprets mammograms and who meets the requirements set forth in 41.6(3)“a.”

“*Kerma*” means the sum of the initial energies of all the charged particles liberated by uncharged ionizing particles in a material of given mass.

“*Laterality*” means the designation of either the right or left breast.

“*Lead interpreting physician*” means the interpreting physician assigned the general responsibility for ensuring that a facility’s quality assurance program meets all of the requirements of this chapter. The administrative title and other supervisory responsibilities of the individual, if any, are left to the discretion of the facility.

“*Mammogram*” means a radiographic image produced through mammography.

“*Mammographic modality*” means a technology for radiography of the breast. Examples are screen-film mammography, xeromammography, and digital mammography.

“*Mammography*” means radiography of the breast but, for the purposes of 641—41.6(136C), does not include:

1. Radiography of the breast performed during invasive interventions for localization or biopsy procedures; or
2. Radiography of the breast performed with an investigational mammography device as part of a scientific study conducted in accordance with FDA investigational device exemption regulations; or
3. Radiography of the breast performed as part of either a breast localization procedure or a post-stereotactic clip placement localization procedure.

“*Mammography equipment evaluation*” means an on-site assessment of the mammography unit or image processor performance by a medical physicist for the purpose of making a preliminary determination as to whether the equipment meets all of the applicable standards.

“*Mammography medical outcomes audit*” means a systematic collection of mammography results and the comparison of those results with outcomes data.

“*Mammography unit(s)*” means an assemblage of components for the production of X-rays for use during mammography including, at a minimum: an X-ray generator, an X-ray control, a tube housing assembly, a beam limiting device, and the supporting structures for these components.

“*Mean optical density*” means the average of the optical densities measured using phantom thicknesses of 2, 4, and 6 centimeters with values of kilovolt peak (kVp) clinically appropriate for those thicknesses.

“*Medical physicist*” means a person trained in evaluating the performance of mammography equipment and facility quality assurance programs and who meets the qualifications for a medical physicist set forth in 41.6(3)“c.”

“*Mediolateral view*” means one of the routine views for mammography in addition to the craniocaudal view. The detector system is placed lateral to the breast and the horizontal X-ray beam is directed from medial to lateral aspect through the breast.

“*MQSA*” means the Mammography Quality Standards Act of 1992.

“*Multi-reading*” means two or more physicians, at least one of whom is an interpreting physician, interpreting the same mammogram. A radiologist may count the current mammographic examination and one prior mammographic examination, provided the radiologist was not the interpreter of the prior mammographic examination. A separate tally shall be kept for the prior examinations.

“*Oblique mediolateral view*” means one of the standard two views of the breast. The detector system (cassette holder assembly) is angled 30-60 degrees from horizontal so that the cassette assembly

is parallel to the pectoral muscle and the corner of the cassette holder fits comfortably into the axilla. The X-ray beam is directed from the supero-medial to the infero-lateral aspect of the breast.

“Patient” means any individual who undergoes a mammography evaluation in a facility, regardless of whether the person is referred by a physician or is self-referred.

“Phantom” means an artificial test object used to simulate radiographic characteristics of compressed breast tissue and containing components that radiographically model aspects of breast disease and cancer.

“Phantom image” means a radiographic image of a phantom.

“Physical science” means physics, chemistry, radiation science (including medical physics and health physics), and engineering.

“Positive mammogram” means a mammogram that has an overall assessment of findings that are either “suspicious” or “highly suggestive of malignancy.”

“Provisional certification” means the six-month certification time period in which a facility has to complete the accreditation/certification process.

“Qualified instructor” means individuals whose training and experience adequately prepare them to carry out specified training assignments. Interpreting physicians, radiologic technologists, or medical physicists who meet the requirements of 41.6(3) would be considered qualified instructors in their respective areas of mammography. Radiological technologists who meet the requirements of 41.6(3) and have passed a state-approved mammography examination such as the examination given by the American Registry of Radiography Technologists would be considered qualified instructors in their respective areas of mammography. The examination would include, but not necessarily be limited to: breast anatomy and physiology, positioning and compression, quality assurance/quality control techniques, and imaging of patients with breast implants. Other examples of individuals who may be qualified instructors for the purpose of providing training to meet the regulations of this chapter include, but are not limited to, instructors in a post-high school training institution and manufacturers’ representatives.

“Quality control technologist” means an individual meeting the requirements of 41.6(5) “a”(4) who is responsible for those quality assurance responsibilities not assigned to the lead interpreting physician or to the medical physicist.

“Radiographic equipment” means X-ray equipment used for the production of static X-ray images.

“Radiologic technologist” means an individual specifically trained in the use of radiographic equipment and in the positioning of patients for radiographic examinations and who meets the requirements set forth in 41.6(3) “b.”

“Radiologist continuing experience” means the number of mammograms interpreted by a radiologist in the past 24-month period. For the purpose of counting, a radiologist may count the current mammographic examination and one prior mammographic examination, provided the radiologist was not the interpreter of the prior mammographic examination. A separate tally shall be kept for the prior examinations.

“Reinstatement” means the process of recertification of a facility that has lost or voluntarily given up previous accreditation/certification.

“Screen-film mammography” means mammography performed with high-detailed intensifying screen(s) in close contact with the film.

“Screening mammography” means X-ray breast examination of asymptomatic individuals in an attempt to detect breast cancer when it is small, nonpalpable, and confined to the breast.

“Serious adverse event” means an adverse event that may significantly compromise clinical outcomes or an adverse event for which a facility fails to take appropriate corrective action in a timely manner.

“Serious complaint” means a report of a serious adverse event.

“Standard breast” means a 4.2 centimeter (cm) thick compressed breast consisting of 50 percent glandular and 50 percent adipose tissue.

“Supplier” means the individual in control of a mammography facility whose basic responsibility is the overall quality of all mammograms conducted in that particular facility.

“*Survey*” means an on-site physics consultation and evaluation of a facility quality assurance program performed by a medical physicist.

“*Time cycle*” means the film development time.

“*Traceable to a national standard*” means an instrument is calibrated at either the National Institute of Standards and Technology (NIST) or at a calibration laboratory that participates in a proficiency program with NIST at least once every two years and the results of the proficiency test conducted within 24 months of calibration show agreement within ± 3 percent of the national standard in the mammography energy range.

“*Written report*” means interpreting physician’s technical narrative of a mammography evaluation.

“*Written statement*” means interpreting physician’s description of a mammography examination written in lay terms.

41.6(2) Registration and application standards and requirements.

a. Registration and certificates.

(1) Each radiation machine used to perform mammography shall be registered according to 641—subrule 39.3(2).

(2) A certificate issued by the FDA or this agency is required for lawful operation of all mammography facilities subject to the provisions of this subrule. To obtain a certificate from the FDA or this agency, facilities are required to meet the quality standards in 641—41.6(136C) and to be accredited and approved by an approved accreditation body.

b. Each facility wishing to perform mammography shall apply for agency approval by providing or verifying the following information for each mammography machine:

(1) The mammography unit meets the criteria for agency-approved mammography accreditation bodies.

(2) The mammography equipment and facility meet the general requirements of these rules for radiation machines.

(3) The radiation machine is specifically designed to perform mammography.

(4) The radiation machine is used according to these rules on patient radiation exposure and radiation dose levels.

(5) The radiation machine is operated by individuals meeting the requirements of this subrule.

(6) The entire mammography system is evaluated at least annually by a medical physicist.

(7) The equipment, personnel, procedures, and records are evaluated annually by a physician consultant.

(8) Provisional or reinstatement certification. A new facility beginning operation after September 30, 1994, is eligible to apply for provisional or reinstatement certification. This will enable the facility to perform mammography and to obtain the clinical images needed to complete the accreditation process. To apply for and receive provisional or reinstatement certification, a facility must meet the requirements of 641—41.6(136C). Provisional or reinstatement certification shall be effective for up to six months from the date of issuance and cannot be renewed. The facility may apply for one 90-day extension.

c. Suspension, revocation, or denial of mammography certification.

(1) Mammography certification may be suspended or revoked with cause if any facility or machine does not meet one or more of the standards of these rules, will not permit inspections or provide access to records or information in a timely fashion, or has been guilty of misrepresentation in obtaining the certification.

(2) The facility shall have opportunity for a hearing in connection with a denial, suspension or revocation of mammography certification in accordance with 641—Chapter 173.

(3) An emergency order suspending or revoking certification may be issued in accordance with 641—173.31(17A) if the agency finds the radiation unit or facility violates rules that seriously affect the health, safety, and welfare of the public. An opportunity for hearing shall be held within 20 working days after the issuance of the order. The order shall be effective during the proceedings.

(4) If certification is revoked, the radiation machine shall not be used for mammography until reinstated.

(5) If a facility's certification is revoked, no person who owned or operated that facility at the time the act occurred may own or operate a mammography facility in Iowa within two years of the date of revocation.

d. Reinstatement of mammography certification after revocation.

(1) An application for reinstatement shall be submitted and processed as an initial application. Appropriate corrective actions must be submitted with the application.

(2) The agency shall inspect the radiation machine within 60 days of the approved reinstatement application.

(3) A full certificate shall be issued only after the agency has inspected the radiation machine and determined that it meets the requirements of these rules.

e. Inspections. The agency shall conduct an inspection of each radiation machine no later than 14 months after initial mammography certification and at least annually thereafter.

f. The authorization of facilities is included in the accreditation process for facilities accredited by the state of Iowa. Determination of the quality of the mammograms produced by facilities accredited by the state of Iowa will be made. To make the determination, each facility will:

(1) Provide at the time of initial accreditation, new unit installation, or reaccreditation (at least every three years) thereafter, two original (not copies) mammography examinations which meet the following criteria for the clinical image review process by the agency:

1. One mammography examination, including craniocaudal and mediolateral oblique views of each breast, of a patient with predominantly fatty breast tissue,

2. One mammography examination, including craniocaudal and mediolateral oblique views of each breast, of a patient with predominantly glandular breast tissue, and

3. Each mammography examination must have been interpreted as a "negative" or "benign" examination.

(2) Provide randomly, at the request of agency mammography inspectors, two mammography examinations (mammograms) which meet the criteria in 41.6(2) "f"(1).

(3) Provide at the time of initial accreditation, new unit installation, or reaccreditation (at least every three years) thereafter, a phantom image taken with the unit being accredited within six months of the submission date for review by the agency.

(4) Be billed the fee for the quality review process as set forth in 641—subparagraph 38.8(1) "b"(2).

(5) Be provided with a written explanation of the results of the quality review process which will accompany the returned mammograms referred to in 41.6(2) "f"(3).

g. Facilities accredited by an approved accrediting body other than the state of Iowa must be authorized by the agency. Quality determination for these facilities will be made by the agency through a phantom image provided at the time of initial authorization, new unit authorization, or reauthorization (at least every three years) thereafter, taken with the unit being accredited within six months of the submission date.

h. Federal mammography regulations. All Iowa facilities performing mammography shall comply with the applicable regulations found in 21 CFR Part 900 which has an effective date of April 28, 1999. Persons certified to perform mammography in Iowa shall be responsible for ensuring compliance with the appropriate CFR regulations or Iowa administrative rules, whichever are more stringent.

i. Soft copy review workstation requirements.

(1) Soft copy review workstations used for final interpretation of mammogram images must be a configuration of two monitors that meet one of the following criteria:

1. Have 5 megapixel resolution; or

2. Be approved by the United States Food and Drug Administration 510K process and be intended for digital mammography use.

(2) The workstation must have a quality control program substantially the same as that outlined by the image receptor manufacturer's quality control manual or that outlined by the image receptor manufacturer's designated soft copy review workstation quality control manual.

41.6(3) Mammography personnel. The following requirements apply to all personnel involved in any aspect of mammography, including the production, processing, and interpretation of mammograms and related quality assurance activities:

a. Interpreting physicians. All radiologists interpreting mammograms shall meet the following qualifications:

(1) Initial qualifications. Unless the exemption in 41.6(3)"a"(3)"1" applies, before beginning to interpret mammograms independently, the interpreting radiologist shall:

1. Be licensed to practice medicine in Iowa;

2. Either:

- Be certified in an appropriate specialty area by a body determined by FDA to have procedures and requirements adequate to ensure that physicians certified by the body are competent to interpret radiological procedures, including mammography; or

- Have had at least three months of documented formal training in the interpretation of mammograms and in topics related to mammography. The training shall include instruction in radiation physics, including radiation physics specific to mammography, radiation effects, and radiation protection. The mammographic interpretation component shall be under the direct supervision of a radiologist who meets the requirements of 41.6(3)"a"; and

3. Have a minimum of 60 hours of documented medical education in mammography, which shall include: instruction in the interpretation of mammograms and education in basic breast anatomy, pathology, and physiology, technical aspects of mammography, and quality assurance and quality control in mammography. All 60 of these hours shall be Category 1 and at least 15 of the Category 1 hours shall have been acquired within the 36 months immediately prior to the date that the radiologist qualifies as an interpreting physician. Hours spent in residency specifically devoted to mammography will be considered as equivalent to Category 1 continuing medical education credits and will be accepted if documented in writing by the appropriate representative of the training institution;

4. Unless the exemption in 41.6(3)"a"(3)"2" applies, have interpreted or multi-read at least 240 mammographic examinations within the six-month period immediately prior to the date that the radiologist qualifies as an interpreting physician. This interpretation or multi-reading shall be under the direct supervision of an interpreting physician; and

5. Before an interpreting physician may begin independently interpreting mammograms produced by a new mammographic modality other than the modality in which the initial training was received, the interpreting physician shall have at least 8 hours of Category 1 continuing medical education credits in the new mammographic modality or at least 8 hours of training in the new mammographic modality provided by a vendor manufacturing the new mammographic modality equipment. An interpreting physician previously qualified to interpret a new mammographic modality in another state will have six months to complete this requirement. The six-month time frame begins when the interpreting physician commences Iowa new mammographic modality interpretation.

(2) Continuing experience and education. All interpreting physicians shall maintain their qualifications by meeting the following requirements:

1. Following the second anniversary date of the end of the calendar quarter in which the requirements of 41.6(3)"a"(1) were completed, the interpreting physician shall have read or multi-read at least 960 mammographic examinations during the prior 24 months, during the 24-month period ending on the last day of the previous calendar quarter, or during any 24-month period between the two. The facility will choose one of these dates to determine the 24-month period.

2. Following the third anniversary date of the end of the calendar quarter in which the requirements of 41.6(3)"a"(1) were completed, the interpreting physician shall have taught or completed at least 15 Category 1 continuing education units in mammography during the prior 36 months, during the 36-month period ending on the last day of the previous calendar quarter, or during any 36-month period between the two. The facility will choose one of these dates to determine the 36-month period.

3. Units earned through teaching a specific course can be counted only once towards the 15 required by 41.6(3) "a"(2)"2" even if the course is taught multiple times during the previous 36 months.

4. Continuing qualifications must be met and a current state of Iowa medical license must be in effect whenever mammography interpretations are performed by the physician.

(3) Exemptions.

1. Those physicians who qualified as interpreting physicians under 41.6(3) "a" or FDA interim regulations prior to April 28, 1999, are considered to have met the initial requirements of 41.6(3) "a." They may continue to interpret mammograms provided they continue to meet the licensure requirements of 41.6(3) "a"(1)"1" and the continuing experience and education requirements of this subrule.

2. Physicians who have interpreted or multi-read at least 240 mammographic examinations under the direct supervision of an interpreting physician in any six-month period during the last two years of a diagnostic radiology residency and who become appropriately board certified at the first allowable time, as defined by an eligible certifying body, are otherwise exempt from 41.6(3) "a"(1)"4."

(4) Reestablishing qualifications. Interpreting physicians who fail to maintain the required continuing experience or continuing education requirements shall reestablish their qualifications before resuming the independent interpretation of mammograms, as follows:

1. Interpreting physicians who fail to meet the continuing experience requirements of 41.6(3) "a"(2)"1" shall:

- Interpret or multi-read at least 240 mammographic examinations under the direct supervision of an interpreting physician, or

- Interpret or multi-read a sufficient number of mammographic examinations, under the direct supervision of an interpreting physician, to bring the physician's total to at least 960 examinations for the prior 24 months, whichever is less. The interpretations required under 41.6(3) "a"(4)"1" shall be done within the six months immediately prior to resuming independent interpretation. Consecutive or back-to-back requalification of mammography personnel, due to failure to meet continuing education or experience requirements, will be allowed once without proof of extenuating circumstances. This agency will determine the validity of such proof and render a decision after review of all pertinent information. Those individuals who are denied requalification will be allowed to resubmit for requalification following a 90-day waiting period.

2. Interpreting physicians who fail to meet the continuing education requirements of 41.6(3) "a"(2)"2" shall obtain a sufficient number of additional Category 1 continuing medical education credits in mammography to bring their total up to the required 15 credits in the previous 36 months before resuming independent interpretation.

b. Radiologic technologists. All mammographic examinations shall be performed by general radiographers who meet the following general requirements, mammography requirements, and continuing education and experience requirements:

(1) General requirements. Be permitted to operate as a general radiographer in Iowa; and

(2) Mammography requirements. Have qualified as a radiologic technologist under 41.6(3) "b" before April 28, 1999, or have completed at least 40 contact hours of documented training specific to mammography under the supervision of a qualified instructor after successful completion of at least a two-year radiography program. The hours of documented training shall include, but not necessarily be limited to:

1. Training in breast anatomy and physiology, positioning and compression, quality assurance/quality control techniques, and imaging of patients with breast implants;

2. The performance of a minimum of 25 examinations under the direct supervision of an individual qualified under 41.6(3) "b"; and

3. Before a radiologic technologist may begin independently performing mammographic examinations using a mammographic modality other than one of those for which the technologist received training under 41.6(3) "b"(2)"3," the technologist shall have at least 8 hours of continuing education units in the new modality. The 8 hours may not be derived from the supervised examination of patients; and

(3) Continuing education requirements.

1. Following the third anniversary date of the end of the calendar quarter in which the requirements of 41.6(3) "b"(1) and (2) were completed, the radiologic technologist shall have taught or completed at least 15 continuing education units in mammography during the prior 36 months, during the 36-month period ending on the last day of the previous calendar quarter, or during any 36-month period between the two. The facility will choose one of these dates to determine the 36-month period.

2. Units earned through teaching a specific course can be counted only once towards the 15 required in 41.6(3) "b"(3) "1" even if the course is taught multiple times during the previous 36 months.

3. Requalification. A radiologic technologist who fails to meet the continuing education requirements of 41.6(3) "b"(3) "1" shall obtain a sufficient number of continuing education units in mammography to bring the total up to at least 15 in the previous 36 months. The continuing education for requalification cannot be obtained by performing supervised mammography examinations. The technologist may not resume performing unsupervised mammography examinations until the continuing education requirements are completed.

4. Continuing qualifications must be met and an Iowa permit to practice radiography must be in effect whenever mammogram procedures are performed by the radiologic technologist.

5. Only 50 percent of the total required mammography continuing education hours may be obtained through presenting, or acting as a trainer for, a continuing education or training program.

(4) Continuing experience requirements.

1. Following the second anniversary date on which the requirements of 41.6(3) "b"(1) and (2) were completed, the radiologic technologist shall have performed a minimum of 200 mammography examinations during the prior 24 months, during the 24-month period ending on the last day of the previous calendar quarter, or during any 24-month period between the two. The facility will choose one of these dates to determine the 24-month period.

2. Requalification. Radiologic technologists who fail to meet the continuing experience requirements of this subrule shall perform a minimum of 25 mammography examinations under the direct supervision of a qualified radiologic technologist before resuming the performance of unsupervised mammography examinations.

3. Continuing qualifications must be met and an Iowa permit to practice radiography must be in effect whenever mammogram procedures are performed by the radiologic technologist.

(5) Consecutive or back-to-back requalification of mammography personnel, due to failure to meet continuing education or experience requirements, will be allowed once without proof of extenuating circumstances. This agency will determine the validity of such proof and render a decision after review of all pertinent information. Those individuals who are denied requalification will be allowed to resubmit for requalification following a 90-day waiting period.

c. Medical physicists. All medical physicists conducting surveys of mammography facilities and providing oversight of the facility quality assurance program under 41.6(3) "c"(2) shall meet the following:

(1) Initial qualifications.

1. Be Iowa approved; and

2. Have a master's degree or higher in a physical science from an accredited institution, with no less than 20 semester hours or 30 quarter hours of college undergraduate or graduate level physics;

3. Have 20 contact hours of documented specialized training in conducting surveys of mammography facilities; and

4. Have experience conducting surveys in at least one mammography facility and have a total of at least 10 mammography units. No more than one survey of a specific unit within a period of 60 days can be counted towards the total mammography unit survey requirement. After April 28, 1999, experience conducting surveys must be acquired under the direct supervision of a medical physicist who meets all the requirements of this subrule; or

(2) Alternative initial qualifications.

1. Have qualified as a medical physicist under FDA interim regulations and have retained that qualification by maintenance of the active status of any licensure, approval, or certification required under the interim regulations; and

2. Prior to April 28, 1999, have:
 - A bachelor's degree or higher in a physical science from an accredited institution with no less than 10 semester hours or equivalent of college undergraduate or graduate level physics.
 - Forty contact hours of documented specialized training in conducting surveys of mammography facilities.
 - Experience conducting surveys in at least one mammography facility and have a total of at least 20 mammography units. No more than one survey of a specific unit within a period of 60 days can be counted towards the total mammography unit survey requirement. The training and experience requirements must be met after fulfilling the degree requirement.
 - At least eight hours of training in surveying units of the new mammographic modality before independently performing mammographic surveys of a new mammographic modality other than one for which the physicist received training to qualify under this subrule.

(3) Continuing qualifications.

1. Continuing education. Following the third anniversary date on which the requirements of 41.6(3) "c"(1) or (2) were completed, the medical physicist shall have taught or completed at least 15 continuing education units in mammography during the prior 36 months, during the 36-month period ending on the last day of the previous calendar quarter, or during any 36-month period between the two. The facility shall choose one of these dates to determine the 36-month period. Units earned through teaching a specific course shall be counted only once towards the required 15 units in a 36-month period, even if the course is taught multiple times during the 36 months.

2. Continuing experience. Following the second anniversary date on which the requirements of this subrule were completed, the medical physicist shall have surveyed at least two mammography facilities and a total of at least 6 mammography units during the prior 24 months, during the 24-month period ending on the last day of the previous calendar quarter, or during any 24-month period between the two. The facility shall choose one of these dates to determine the 24-month period. No more than one survey of a specific facility within a 10-month period or a specific unit within a period of 60 days shall be counted towards this requirement.

3. Continuing qualifications must be met whenever medical physics services are provided by the medical physicist.

(4) Reestablishing qualifications. Medical physicists who fail to maintain the required continuing qualifications of this subrule may not perform the MQSA surveys without the supervision of a qualified medical physicist. Before independently surveying another facility, medical physicists must reestablish their qualifications as follows:

1. Medical physicists who fail to meet the continuing education requirements of this subrule shall obtain a sufficient number of continuing education units to bring their total units up to the required 15 in the previous three years.

2. Medical physicists who fail to meet the continuing experience requirements of this subrule shall complete a sufficient number of surveys under the direct supervision of a medical physicist who meets the qualifications of this subrule to bring their total surveys up to the required two facilities and 6 units in the previous 24 months. No more than one survey of a specific unit within a period of 60 days can be counted towards the total mammography unit survey requirement.

d. Retention of personnel records. Facilities shall maintain records to document the qualifications of all personnel who worked at the facility as interpreting physicians, general radiographers, or medical physicists. These records must be available for review by the MQSA inspectors. Records of personnel no longer employed by the facility should not be discarded until the next annual inspection has been completed and the agency has determined that the facility is in compliance with the MQSA personnel requirements.

41.6(4) Obtaining and preserving records.

a. The facility performing the current mammography examination must make all reasonable efforts to obtain the patient's recent mammography records, including original images or films, copies of written reports prepared by interpreting physicians, and other relevant information pertinent to

previous mammograms that might be available from other facilities, for comparison with the current mammography records.

b. The facility must make, for each patient, a written report of each mammography examination performed. This report shall include:

- (1) The date the mammography procedure was performed.
- (2) The date of the interpretation.
- (3) The name of the interpreting physician.
- (4) The name of the patient and an additional patient identifier.
- (5) A description of the procedures performed.
- (6) The name of the referring physician (if any) or other physician (if any) identified by the patient to receive the interpreting physician's written report.
- (7) The date the interpreting physician's written report was sent to the appropriate physician or patient.
- (8) A separate and distinct section entitled, "Assessment" with the appropriate assessment term. One of the following terms in quotations or an approved equivalent must be included in the assessment:
 1. "Negative": Nothing to comment upon (if the interpreting physician is aware of clinical findings or symptoms, despite the negative assessment, these shall be explained).
 2. "Benign": Also a negative assessment.
 3. "Probably benign": Finding(s) has a high probability of being benign.
 4. "Suspicious": Finding(s) without all the characteristic morphology of breast cancer but indicating a definite probability of being malignant.
 5. "Highly suggestive of malignancy": Finding(s) has a high probability of being malignant.
 6. "Incomplete: Need additional imaging evaluation" shall be assigned as an assessment in cases where no final assessment category can be assigned due to incomplete workup, and reasons why no assessment can be made shall be stated by the interpreting physician.
- (9) Recommendations made to the health care provider about what additional actions, if any, should be taken. All clinical questions raised by the referring health care provider shall be addressed in the report to the extent possible, even if the assessment is negative or benign.
- (10) Information on a patient's breast density, as categorized by an interpreting physician at the facility based on standards as defined in nationally recognized guidelines or systems for breast imaging reporting of mammography screening, including the breast imaging reporting and data system of the American College of Radiology.

c. Preservation of records.

- (1) The facility must provide satisfactory assurances (as documented in its medical records) that the images or films of the first and subsequent mammography procedures and the related written reports of the interpreting physician for each patient are either placed in the patient's medical record kept by the facility or sent for placement in the patient's medical record as directed by the patient's physician or the patient.
- (2) Records retained by the facility must be retained for at least 60 calendar months following the date of service, as long as the patient continues consecutive mammograms. If no additional mammograms of the patient are performed, the records must be retained for at least ten years.
- (3) If the facility should cease to exist before the end of the retention period, the records must be transferred to the patient or patient's physician or other mammographic facility.
- (4) The facility shall upon request by, or on behalf of, the patient, permanently or temporarily, transfer the original mammograms and copies of the patient's reports to a medical institution, or to a physician or health care provider of the patient, or to the patient directly.
- (5) Any fee charged to the patient for providing the services in subparagraph (4) above shall not exceed the documented costs associated with this service.

d. Communication of results to the patient. Each facility shall maintain a system to ensure that the results of each mammographic examination are communicated in lay terms to each patient in a time period not to exceed 30 days from the date of the mammography examination. If assessments are "Suspicious" or "Highly suggestive of malignancy" and the patient has not named a health care provider,

the facility shall make reasonable attempts to ensure that the results are communicated to the patient as soon as possible.

(1) As soon as possible, but no later than 30 days from the date of the mammography examination, patients who do not name a health care provider to receive the mammography report shall be sent the report described in 41.6(4)“e”(1) in addition to a written notification of results in lay terms.

(2) Each facility that accepts patients who do not have a primary care provider shall maintain a system for referring such patients to a health care provider when clinically indicated.

(3) The breast density information as designated in the report pursuant to 41.6(4)“b”(10) shall be included in the patient lay letter with a reference to a department-accepted site or document where the patient can obtain more information about breast density. For patients categorized as having heterogeneously dense breasts or extremely dense breasts, or an equivalent determination by another nationally recognized density gradient system, the notification to the patient shall include evidence-based information on dense breast tissue, the increased risk associated with dense breast tissue, and the effects of dense breast tissue on screening mammography and shall be stated in language appropriate for the facility’s patient population.

e. Communication of results to health care providers. When the patient has a referring health care provider or the patient has named a health care provider, the facility shall:

(1) Provide a written report of the mammography examination, including all of the items listed in 41.6(4)“b,” to the health care provider as soon as possible, but no later than 30 days from the date of the examination, and

(2) If the assessment is “Suspicious” or “Highly suggestive of malignancy,” make reasonable attempts to communicate with the health care provider as soon as possible or, if the health care provider is unavailable, to a responsible designee of the health care provider.

f. Mammographic image identification. Each mammographic image shall have the following information indicated on it in a permanent, legible, and unambiguous manner and placed so as not to obscure anatomic structures:

(1) Name of patient and an additional patient identifier.

(2) Date of examination.

(3) View and laterality. This information shall be placed on the image in a position near the axilla. Standardized codes specified by the accreditation body and approved by the FDA shall be used to identify view and laterality.

(4) Facility name and location. At a minimum, the location shall include the city, state, and ZIP code of the facility.

(5) Technologist identification.

(6) Cassette/screen identification.

(7) Mammography unit identification, if there is more than one unit in the facility.

41.6(5) *Quality assurance program.*

a. The facility shall ensure that the facility has an equipment quality assurance program specific to mammography and covering all components of the system to ensure consistently high-quality images with minimum patient exposure. Responsibility for the quality assurance program and for each of its elements shall be assigned to individuals who are qualified for their assignments and who shall be allowed adequate time to perform these duties.

(1) Lead interpreting physician. The facility shall identify a lead interpreting physician who shall have the general responsibility of ensuring that the quality assurance program meets all requirements of these rules. No other individual shall be assigned or shall retain responsibility for quality assurance tasks unless the lead interpreting physician has determined that the individual’s qualifications for, and performance of, the assignment are adequate.

(2) Interpreting physicians. All interpreting physicians interpreting mammograms for the facility shall:

1. Follow the facility procedures for corrective action when the images they are asked to interpret are of poor quality, and

2. Participate in the facility’s medical outcomes audit program.

(3) Medical physicist. Each facility shall have the services of a medical physicist available to survey mammography equipment and oversee the equipment-related quality assurance practices of the facility. At a minimum, the medical physicist(s) shall be responsible for performing the surveys and mammography equipment evaluations and providing the facility with the applicable reports.

(4) Quality control technologist. Responsibility for all individual tasks within the quality assurance program not assigned to the lead interpreting physician or the medical physicist shall be assigned to a quality control technologist(s). The tasks are to be performed by the quality control technologist or by other personnel qualified to perform the tasks. When other personnel are utilized for these tasks, the quality control technologist shall ensure that the tasks are completed in such a way as to meet the requirements of 41.6(5) "e" through "k."

b. The facility shall ensure that a general review of the program is conducted at least annually and have available the services of a qualified medical physicist who is capable of establishing and conducting the program.

c. Under the direction of the lead interpreting physician, the medical physicist shall have responsibility for establishing and conducting the equipment quality assurance program. The program shall include:

- (1) Conducting or training others to conduct equipment performance monitoring functions.
- (2) Analyzing the monitoring results to determine if there are any problems requiring correction.
- (3) Ensuring that the facility has procedures in place for carrying out or arranging for the necessary corrective actions as well as for the calibrations and other preventive maintenance.

d. Calibration of equipment. All variable parameters of the equipment shall be calibrated:

- (1) When the equipment is first installed.
- (2) After any major changes or replacement of parts.
- (3) At least annually during use based on recommendations of the mammography imaging medical physicist.

(4) When quality assurance tests indicate that calibration is needed.

e. Performance monitoring. The supplier shall routinely ensure that the performance of the mammography system is monitored. The parameters to be monitored for film-screen mammography shall include but not be limited to:

- (1) Processor performance (through daily sensitometric-densitometric means).
- (2) Half-value layer.
- (3) Output reproducibility and linearity.
- (4) Automatic exposure control reproducibility and linearity.
- (5) Adequacy of film storage (both before use and after exposure if processing does not occur immediately).

(6) Availability and use of technique charts that shall include an indication of the kV-target-filter combination to be used with each image receptor.

(7) Darkroom integrity, to be performed at least semiannually or when conditions have changed, shall include an inspection for light leaks, a fog test, and a safe light test.

(8) Image quality. The minimum image quality achieved at a mammography facility shall be the ability to observe the image of at least four 0.75-mm fibrils, three 0.32-mm speck groups, and three 0.75-mm masses from an FDA-approved phantom (or equivalent) on the standard mammographic film used at the facility. No mammograms shall be performed if this minimum is not met.

f. Frequency of monitoring.

- (1) Processor performance shall be accomplished daily before processing patient films.
- (2) Image quality shall be monitored at least weekly with a phantom and every time the unit is altered including the replacement of parts.

(3) All other parameters shall be proportional to the expected variability of each parameter, but at least annually.

g. Evaluation of monitoring results. Full field digital mammography units must comply with the quality control test requirements outlined by the performance criteria in the appropriate manufacturer's quality control manual.

(1) Standards of image quality giving acceptable ranges of values for each of the parameters tested shall be established to aid in the evaluation. The standards of image quality related to dose shall include a requirement that the mean glandular dose for one craniocaudal view of a 4.2 cm compressed breast (50 percent adipose/50 percent glandular) or equivalent phantom shall not exceed 100 millirad for film-screen units with no grids, 300 millirad for film-screen units with grids, or 300 millirad for full field digital units.

(2) The monitoring results shall be compared routinely by the facility staff to the standards of image quality in 41.6(5)“k.” If the results fall outside the acceptable range, the test shall be repeated. For film-screen mammography, if the results continue to be unacceptable, the source of the problem shall be identified and corrected before further examinations are conducted. For full field digital mammography, if any test results fall outside the performance criteria range listed for the unit, specific actions as directed in the appropriate quality control manual shall be followed.

h. Retake analysis program—film-screen and full field digital.

(1) A program shall be established as a further aid in detecting and correcting problems affecting image quality or exposure.

(2) All retakes shall be logged including date, technologist’s name and reason for retake. A retake analysis shall be performed every 250 patients or quarterly, whichever comes first. If more than 250 mammograms are performed in one week, weekly analysis is acceptable.

(3) If the total repeat or reject rate changes from the previously determined rate by more than 2.0 percent of the total films included in the analysis, the reason(s) for the change shall be determined. Any corrective actions shall be recorded and the results of these corrective actions shall be assessed.

i. Medical outcomes audit. Each facility shall establish a system for reviewing outcome data from all mammography performed, including follow-up on the disposition of positive mammograms and correlation of surgical biopsy results with the interpreting physician’s findings. This program shall be designed to ensure the reliability, clarity, and accuracy of the interpretation of mammograms.

(1) Analysis of these outcome data shall be made individually and collectively for all interpreting physicians at the facility. In addition, any cases of breast cancer among women imaged at the facility that subsequently become known to the facility shall prompt the facility to initiate follow-up on surgical and pathology results, or both, and review of the mammograms taken prior to the diagnosis of a malignancy. Responsibility for each requirement for monitoring shall be assigned to qualified personnel and documented in the facility’s records.

(2) Frequency of audit analysis. The facility’s first audit analysis shall be initiated no later than 12 months after the date the facility becomes certified, or 12 months after April 28, 1999, whichever date is the latest. This audit analysis shall be completed within an additional 12 months to permit completion of diagnostic procedures and data collection. Subsequent audit analyses will be conducted at least once every 12 months.

(3) Reviewing interpreting physician. Each facility shall designate at least one interpreting physician to review the medical outcomes audit data at least once every 12 months. This individual shall record the dates of the audit period(s) and shall be responsible for analyzing results based on this audit. This individual shall also be responsible for documenting the results and notifying other interpreting physicians of the results and the facility aggregate results. If follow-up actions are taken, the reviewing interpreting physician shall also be responsible for documenting the nature of the follow-up. The reviewing physician shall sign the medical audit as proof of the evaluation of the data.

j. Quality assurance records. The lead interpreting physician, quality control technologist, and medical physicist shall ensure that records concerning employee qualifications to meet assigned quality assurance tasks, mammography technique and procedures, quality control (including monitoring data, problems detected by analysis of that data, corrective actions, and the effectiveness of the corrective actions), safety, and protection are properly maintained and updated. These quality control records shall be kept for each test specified in these rules until the next annual inspection has been completed and the facility is in compliance with the quality assurance requirements or until the test has been performed two additional times at the required frequency, whichever is longer.

k. Quality assurance—equipment.

(1) Daily quality control tests. Film processors used to develop mammograms shall be adjusted and maintained to meet the technical development specifications for the mammography film in use. A processor performance test shall be performed on each day that clinical films are processed before any clinical films are processed that day. The test shall include an assessment of base plus fog density, mid-density, and density difference, using the mammography film used clinically at the facility.

1. The base plus fog density shall be below plus 0.03 of the established operating level.
2. The mid-density shall be within plus or minus 0.15 of the established operating level.
3. The density difference shall be within plus or minus 0.15 of the established operating level.

(2) Weekly quality control tests. Facilities with screen-film systems shall perform an image quality evaluation test, using an FDA-approved phantom, at least weekly.

1. The optical density of the film at the center of an image of a standard FDA-accepted phantom shall be at least 1.20 when exposed under a typical clinical condition.

2. The optical density of the film at the center of the phantom image shall not change by more than plus or minus 0.20 from the established operating level.

3. The phantom image shall achieve at least the minimum score established by the accreditation body and accepted by the FDA.

4. The density difference between the background of the phantom and an added test object used to assess image contrast shall be measured and shall not vary by more than plus or minus 0.05 from the established operating level.

(3) Quarterly quality control tests. Facilities with screen-film systems shall perform the following quality control tests at least quarterly:

- Fixer retention in film. The residual fixer shall be no more than 5 micrograms per square centimeter.

(4) Semiannual quality control tests. Facilities with screen-film systems shall perform the following quality control tests at least semiannually:

1. Darkroom fog. The optical density attributable to darkroom fog shall not exceed 0.05 when a mammography film of the type used in the facility, which has a mid-density of no less than 1.2 OD, is exposed to typical darkroom conditions for two minutes while such film is placed on the countertop emulsion side up. If the darkroom has a safelight used for mammography film, it shall be on during this test.

2. Screen-film contact. Testing for screen-film contact shall be conducted using 40 mesh copper screen. All cassettes used in the facility for mammography shall be tested.

3. Compression device performance. The maximum compression force for the initial power drive shall be between 25 pounds (111 newtons) and 45 pounds (200 newtons).

(5) Annual quality control tests. Facilities with screen-film systems shall perform the following quality control tests at least annually:

1. Automatic exposure control (AEC) performance.

- The AEC shall be capable of maintaining film optical density (OD) within plus or minus 0.15 of the mean optical density when thickness of a homogenous material is varied over a range of 2 to 6 centimeters and the kVp is varied appropriately for such thicknesses over the kVp range used clinically in the facility.

- The optical density of the film in the center of the phantom image shall not be less than 1.20.

2. kVp accuracy and reproducibility.

- The kVp shall be accurate within plus or minus 5 percent of the indicated or selected kVp at the lowest clinical kVp that can be measured by a kVp test device, the most commonly used clinical kVp, and the highest available clinical kVp.

- At the most commonly used clinical settings of kVp, the coefficient of variation of reproducibility of the kVp shall be equal to or less than 0.02.

3. Focal spot condition. Facilities shall evaluate focal spot condition only by determining the system resolution.

- Each X-ray system used for mammography, in combination with the mammography screen-film combination used in the facility, shall provide a minimum resolution of 11 cycles/millimeters (mm)

(line-pairs/mm) when a high contrast resolution bar test pattern is oriented with the bars perpendicular to the anode-cathode axis, and a minimum resolution of 13 line-pairs/mm when the bars are parallel to that axis.

- The bar pattern shall be placed 4.5 centimeters above the breast support surface, centered with respect to the chest wall edge of the image receptor, and with the edge of the pattern within 1 centimeter of the chest wall edge of the image receptor.
- When more than one target material is provided, the measurement above shall be made using the appropriate focal spot for each target material.
- When more than one SID is provided, the test shall be performed at the SID most commonly used clinically.
- Test kVp shall be set at the value used clinically by the facility for a standard breast and shall be performed in the AEC mode, if available. If necessary, a suitable absorber may be placed in the beam to increase exposure times. The screen-film cassette combination used by the facility shall be used to test for this requirement and shall be placed in the normal location used for clinical procedures.
- Focal spot dimensions. Measured values of the focal spot length (dimension parallel to the anode-cathode axis) and width (dimension perpendicular to the anode-cathode axis) shall be within tolerance limits specified in Table 1.

Table 1

| Focal Spot Tolerance Limit Nominal Focal Spot Size (mm) | Maximum Measured Dimensions Width (mm) | Length (mm) |
|---|--|-------------|
| 0.10 | 0.15 | 0.15 |
| 0.15 | 0.23 | 0.23 |
| 0.20 | 0.30 | 0.30 |
| 0.30 | 0.45 | 0.65 |
| 0.40 | 0.60 | 0.85 |
| 0.60 | 0.90 | 1.30 |

4. Beam quality and half-value layer (HVL). The HVL shall meet the specification of 41.1(4) and 41.1(6) for the minimum HVL. These values, extrapolated to the mammographic range, are shown in Table 2. Values not shown in Table 2 may be determined by linear interpolation or extrapolation.

Table 2

| X-ray Tube Voltage (kilovolt peak) and Minimum HVL Designed Operating Range (kV) Below 50 | |
|---|---------------------------------------|
| Measured Operating Voltage (kV) | Minimum HVL (millimeters of aluminum) |
| 20 | 0.20 |
| 25 | 0.25 |
| 30 | 0.30 |

5. Breast entrance air kerma and AEC reproducibility. The coefficient of variation for both air kerma and mAs shall not exceed 0.05.

6. Dosimetry. The average glandular dose delivered during a single cranio-caudal view of an FDA-accepted phantom simulating a standard breast shall not exceed 0.3 rad (3.0 milligray (mGy)) per exposure. The dose shall be determined with technique factors and conditions used clinically for a standard breast.

7. X-ray field/light field/image receptor/compression paddle alignment.

- All systems shall have beam-limiting devices that allow the entire chest wall edge of the X-ray field to extend to the chest wall edge of the image receptor and provide means to ensure that the X-ray field does not extend beyond any edge of the image receptor by more than 2 percent of the SID.

- The chest wall edge of the compression paddle shall not extend beyond the chest wall edge of the image receptor by more than 1 percent of the SID when tested with the compression paddle placed above the breast support surface at a distance equivalent to standard breast thickness. The shadow of the vertical edge of the compression paddle shall be not be visible on the image.

8. Uniformity of screen speed. Uniformity of screen speed of all the cassettes in the facility shall be tested and the difference between the maximum and minimum optical densities shall not exceed 0.30. Screen artifacts shall also be evaluated during this test.

9. System artifacts. System artifacts shall be evaluated with a high-grade, defect-free sheet of homogeneous material large enough to cover the mammography cassette and shall be performed for all cassette sizes used in the facility using a grid appropriate for the cassette size being tested. System artifacts shall also be evaluated for all available focal spot sizes and target filter combinations used clinically.

10. Radiation output.

- The system shall be capable of producing a minimum output of 800 milliRoentgen (mR) per second (7.0 mGy air kerma per second) when operating at 28 kVp in the standard (moly/moly) mammography mode at any SID where the system is designed to operate and when measured by a detector with its center located 4.5 centimeters above the breast support surface with the compression paddle in place between the source and the detector.

- The system shall be capable of maintaining the required minimum radiation output averaged over a 3.0 second period.

11. Decompression. If the system is equipped with a provision for automatic decompression after completion of an exposure or interruption of power to the system, the system shall be tested to confirm that it provides:

- An override capability to allow maintenance of compression;
- A continuous display of the override status; and
- A manual emergency compression release that can be activated in the event of power or automatic release failure.

(6) Quality control tests—other modalities. For systems with image receptor modalities other than screen-film, the quality assurance program shall be substantially the same as the quality assurance program recommended by the image receptor manufacturer, except that the maximum allowable dose shall not exceed the maximum allowable dose for screen-film systems in 41.6(5) “k”(5)“6.”

(7) Use of test results.

1. After completion of the tests specified in 41.6(5) “k,” the facility shall compare the test results to the corresponding specified action limits; or, for non-screen-film modalities, to the manufacturer’s recommended action limits; or, for post-move, preexamination testing of mobile units, to the limits established in the test method used by the facility.

2. If the test results fall outside the action limits, the source of the problem shall be identified, and corrective actions shall be taken before any further examinations are performed or any films are processed using the component of the mammography system that failed the test, if the failed test was that described in 41.6(5) “k.”

3. Full field digital unit corrective actions shall be made as prescribed in the appropriate manufacturer’s quality control manual or in accordance with the appropriate FDA-approved alternative requirements.

(8) Surveys.

1. At least once a year, each facility shall undergo a survey by a medical physicist or by an individual under the direct supervision of a medical physicist. At a minimum, this survey shall include the performance of tests to ensure that the facility meets the quality assurance requirements of the annual tests described in 41.6(5) “k”(5) and (6), the weekly phantom image quality test described in 41.6(5) “k”(2) and the quarterly retake analysis results described in 41.6(5) “h.”

2. The results of all tests conducted by the facility in accordance with 41.6(5) “k”(1) through (7) for film-screen units, as well as written documentation of any corrective actions taken and their results, shall be evaluated for adequacy by the medical physicist performing the survey. Surveys of full field digital mammography units shall be conducted as described in the appropriate manufacturer’s quality control manual. The results of the tests, any corrective actions taken and their results shall be evaluated for adequacy by the medical physicist performing the survey.

3. The medical physicist shall prepare a survey report that includes a summary of this review and recommendations for necessary improvements.

4. The survey report shall be sent to the facility within 30 days of the date of the survey.

5. The survey report shall be dated and signed by the medical physicist performing or supervising the survey. If the survey was performed entirely or in part by another individual under the direct supervision of the medical physicist, that individual and the part of the survey that individual performed shall also be identified in the survey report.

(9) Mammography equipment evaluations. Additional evaluations of mammography units or image processors or any other applicable mammography system ancillary parts shall be conducted at new installations, at disassembly, at reassembly, at the same or a new location, or when major components are changed or repaired. These evaluations shall be used to determine whether the new or changed equipment meets the requirements of applicable standards in 41.6(5) and 41.6(6). All problems shall be corrected before the new or changed equipment is put into service for examinations or film processing. The mammography equipment evaluation shall be performed by a medical physicist or by an individual under the direct supervision of an Iowa-approved medical physicist.

(10) Facility cleanliness.

1. The facility shall establish and implement adequate protocols for maintaining darkroom, screen, and viewbox cleanliness.

2. The facility shall document that all cleaning procedures are performed at the frequencies specified in the protocols.

(11) Calibration of air kerma measuring instruments. Instruments used by medical physicists in their annual survey to measure the air kerma or air kerma rate from a mammography unit shall be calibrated at least once every two years and each time the instrument is repaired. The instrument calibration must be traceable to a national standard and calibrated with an accuracy of plus or minus 6 percent (95 percent confidence level) in the mammography energy range.

(12) Infection control. Facilities shall establish and comply with a system specifying procedures to be followed by the facility for cleaning and disinfecting mammography equipment after contact with blood or other potentially infectious materials. This system shall specify the methods for documenting facility compliance with the infection control procedures established and shall:

1. Comply with all applicable federal, state, and local regulations pertaining to infection control; and

2. Comply with the manufacturer’s recommended procedures for the cleaning and disinfecting of the mammography equipment used in the facility; or

3. If adequate manufacturer’s recommendations are not available, comply with generally accepted guidance on infection control, until such recommendations become available.

l. Mammography procedures and techniques for mammography of patients with breast implants.

(1) Each facility shall have a procedure to inquire whether or not the patient has breast implants prior to the actual mammographic examination.

(2) Except where contraindicated, or unless modified by a physician’s directions, patients with breast implants undergoing mammography shall have mammographic views to maximize the visualization of breast tissue.

m. Consumer complaint mechanism. Each facility shall:

(1) Establish a written and documented system for collecting and resolving consumer complaints;

(2) Maintain a record of each serious complaint received by the facility for at least three years from the date the complaint was received;

(3) Provide the consumer with adequate directions for filing serious complaints with the facility's accreditation body and any other appropriate regulatory entity if the facility is unable to resolve a serious complaint to the consumer's satisfaction.

(4) Report unresolved serious complaints to the accreditation body in a manner and time frame specified by the accreditation body.

n. Clinical image quality. Clinical images produced by any certified facility must continue to comply with the standards for clinical image quality established by that facility's accreditation body.

o. Additional mammography review and patient notification.

(1) If the agency believes that mammography quality at a facility has been compromised and may present a serious risk to human health, the facility shall provide clinical images and other relevant information, as specified by the agency, for review by the accreditation body or other entity designated by the agency. This additional mammography review will help the agency to determine whether the facility is in compliance with rule 641—41.6(136C) and, if not, whether there is a need to notify affected patients, their physicians, or the public that the reliability, clarity, and accuracy of interpretation of mammograms has been compromised.

(2) If the agency determines that any activity related to the provision of mammography at a facility may present a serious risk to human health such that patient notification is necessary, the facility shall notify patients or their designees, their physicians, or the public of action that may be taken to minimize the effects of the risk. Such notification shall occur within a time frame and a manner specified by the agency.

41.6(6) Equipment standards. The equipment used to perform mammography shall meet the following standards:

a. Design: Be specifically designed for mammography. This prohibits systems that have been modified or equipped with special attachments for mammography.

b. Performance standards: Meet the Food and Drug Administration (FDA) performance standards for diagnostic X-ray systems and their major components found in 21 CFR 1020.30 and FDA standards for radiographic equipment in 21 CFR 1020.31.

c. Image receptor systems: Have image receptor systems and individual components which are appropriate for mammography and used according to the manufacturer's recommendations.

(1) Systems using screen-film image receptors shall provide, at a minimum, for operation for image receptors of 18 × 24 centimeters and 24 × 30 centimeters.

(2) Systems using screen-film image receptors shall be equipped with moving grids matched to all image receptor sizes provided.

(3) Systems used for magnification procedures shall be capable of operation with the grid removed from between the source and image receptor.

d. Light fields: For any system with a light beam that passes through the X-ray beam-limiting device, the light shall provide an average illumination of not less than 160 lux (15 foot candles) at 100 centimeters or the maximum source-image receptor distance (SID), whichever is less.

e. Magnification:

(1) Systems used to perform noninterventional problem-solving procedures shall have radiographic magnification capability available for use by the operator.

(2) Systems used for magnification procedures shall provide, at a minimum, at least one magnification value within the range of 1.4 to 2.0.

f. Tube-image receptor assembly:

(1) The assembly shall be capable of being fixed in any position where it is designed to operate. Once fixed in any such position, it shall not undergo unintended motion.

(2) The mechanism ensuring compliance with this subrule shall not fail in the event of power interruption.

g. Film/screen contact: Shall check film/screen contact when cassettes are first placed into use and semiannually thereafter.

h. Focal spot: The focal spot size, magnification factor and source to image receptor distance (SID) shall be appropriate for mammography and in the ranges shown below:

| SID | Nominal Focal Spot Size |
|-------------|-------------------------|
| > 65 cm | < or = to 0.6 mm |
| 50 to 65 cm | < or = to 0.5 mm |
| < 50 cm | < or = to 0.4 mm |

(1) When more than one focal spot is provided, the system shall indicate, prior to exposure, which focal spot is selected.

(2) When more than one target material is provided, the system shall indicate, prior to exposure, the preselected target material.

(3) When the target material or focal spot, or both, is selected by a system algorithm that is based on the exposure or on a test exposure, the system shall display, after the exposure, the target material or focal spot, or both, actually used during the exposure.

i. Compression devices: Shall have compression devices parallel to the imaging plane and able to immobilize and compress the breast with a force of at least 25 pounds per square inch and shall be capable of maintaining this compression for at least three seconds. Effective October 28, 2002, each system shall provide:

(1) An initial power-driven compression activated by hands-free controls operable from both sides of the patient; and

(2) Fine adjustment compression controls operable from both sides of the patient.

(3) Systems shall be equipped with different sized compression paddles that match the sizes of all full field image receptors provided for the system. Compression paddles for special purposes, including those smaller than the full size of the image receptor (for "spot compression"), may be provided. Such compression paddles for special purposes are not subject to 41.6(6) "i"(6) and (7).

(4) Except as provided in 41.6(6) "i"(5), the compression paddle shall be flat and parallel to the breast support table and shall not deflect from parallel by more than 1.0 cm at any point on the surface of the compression paddle when compression is applied.

(5) Equipment intended by the manufacturer's design not to be flat and parallel to the breast support table during compression shall meet the manufacturer's design specifications and maintenance requirements.

(6) The chest wall edge of the compression paddle shall be straight and parallel to the edge of the image receptor.

(7) The chest wall edge may be bent upward to allow for patient comfort but shall not appear on the image.

j. Grids: Shall have the capability for using antiscatter grids.

k. AEC: Shall have automatic exposure control such that:

(1) Each screen-film system shall provide an AEC mode that is operable in all combinations of equipment configuration provided, e.g., grid, nongrid; magnification, nonmagnification; and various target-filter combinations.

(2) The positioning or selection of the detector shall permit flexibility in the placement of the detector under the target tissue.

- The size and available positions of the detector shall be clearly indicated at the X-ray input surface of the breast compression paddle.

- The selected position of the detector shall be clearly indicated.

(3) The system shall provide means for the operator to vary the selected optical density from the normal (zero) setting.

l. Control panel: Shall have a control panel that:

(1) Gives a positive indication when X-rays are being produced.

(2) Gives an audible signal indicating termination of exposure.

(3) Has manual selection of milliamperere seconds (mAs) or at least one of its component parts (milliamperere (mA) or time, or both).

(4) Has the technique factors (peak tube potential in kilovolts (kV) and either tube current in mA and exposure time in seconds or the product of tube current and exposure time in mAs) to be used during an exposure indicated before the exposure begins, except when AEC is used, in which case the technique factors that are set prior to the exposure shall be indicated.

(5) Has a system that, following AEC mode use, shall indicate the actual kilovoltage peak (kVp) and mAs used during the exposure.

m. mAs: Shall indicate, or provide a means of determining, the mAs resulting from each exposure made with automatic exposure control.

n. Viewboxes: Shall have a viewbox that is checked periodically to ensure optimal conditions. When the mammogram is placed on the viewbox, the area surrounding the film must be masked to exclude extraneous light which may reduce image contrast.

o. X-ray film: Shall use X-ray film that has been designated by the film manufacturer as appropriate for mammography and that is matched to the screen's spectral output as specified by the manufacturer.

p. Intensifying screens: Shall use intensifying screens that have been designated by the screen manufacturer as appropriate for mammography.

q. Chemicals: Shall use chemical solutions for processing mammography films that are capable of developing the films in a manner equivalent to the minimum requirements specified by the film manufacturer.

r. Hot-lights: Shall make special lights for film illumination, i.e., hot-lights, capable of producing light levels greater than that provided by the viewbox, available to the interpreting physicians.

s. Masking devices: Shall ensure that film masking devices that can limit the illuminated area to a region equal to or smaller than the exposed portion of the film are available to all interpreting physicians interpreting for the facility.

t. Mobile units and vans—film-screen.

(1) A phantom image shall be produced, processed, and evaluated after each relocation and prior to examinations being conducted.

(2) If processing is not available, a check of the radiation output shall be made and compared to a preset standard for quality. Equipment shall be recalibrated as necessary to maintain quality of phantom image.

u. Mobile units and vans—full field digital. Appropriate manufacturer's quality control manual procedures and criteria shall be met.

41.6(7) Safety standards for mammography equipment.

a. Proper safety precautions shall be maintained and shall include, but not be limited to, adequate shielding for patients, personnel, and facilities. The equipment shall be operated only from a shielded position.

b. Equipment operators shall be monitored in accordance with 641—40.37(136C).

c. Annual inspections shall be conducted by an inspector from the agency to ensure compliance with these rules. Identified hazards shall be promptly corrected.

d. Equipment shall be shockproof and grounded to protect against electrical hazards.

e. Records of all inspections, reports, and consultations shall be maintained for at least seven years.

RULE 641—41.6(136C)—APPENDIX I
Rescinded IAB 4/5/00, effective 5/10/00

RULE 641—41.6(136C)—APPENDIX II
Glandular Dose (in mrad) for 1 Roentgen Entrance Exposure
4.5-cm Breast Thickness—50% Adipose/50% Glandular Breast Tissue*

| HVL | Mo/Mo Target Filter X-Ray Voltage (kVp) | | | | | | | | | | | W/AI Target Filter Combination | |
|------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------------------|-----|
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | | |
| 0.23 | 109 | | | | | | | | | | | | |
| 0.24 | 113 | 116 | | | | | | | | | | | |
| 0.25 | 117 | 120 | 122 | | | | | | | | | | |
| 0.26 | 121 | 124 | 126 | 128 | | | | | | | | | |
| 0.27 | 126 | 128 | 130 | 132 | 134 | | | | | | | | |
| 0.28 | 130 | 132 | 134 | 136 | 138 | 139 | | | | | | | |
| 0.29 | 135 | 137 | 139 | 141 | 142 | 143 | 144 | | | | | | |
| 0.30 | 139 | 141 | 143 | 145 | 146 | 147 | 148 | 149 | | | | | 170 |
| 0.31 | 144 | 146 | 147 | 149 | 150 | 151 | 152 | 153 | 154 | | | | 175 |
| 0.32 | 148 | 150 | 151 | 153 | 154 | 155 | 156 | 158 | 159 | 160 | 160 | | 180 |
| 0.33 | 153 | 154 | 155 | 157 | 158 | 159 | 160 | 162 | 163 | 164 | 164 | | 185 |
| 0.34 | 157 | 159 | 160 | 161 | 162 | 163 | 164 | 166 | 167 | 168 | 168 | | 190 |
| 0.35 | | 163 | 164 | 166 | 167 | 168 | 169 | 170 | 171 | 172 | 172 | | 194 |
| 0.36 | | | 168 | 170 | 171 | 172 | 173 | 174 | 175 | 176 | 176 | | 199 |
| 0.37 | | | | 174 | 175 | 176 | 177 | 178 | 178 | 179 | 180 | | 204 |
| 0.38 | | | | | 179 | 180 | 181 | 182 | 182 | 183 | 184 | | 208 |
| 0.39 | | | | | | 184 | 185 | 186 | 186 | 187 | 188 | | 213 |
| 0.40 | | | | | | | 189 | 190 | 191 | 192 | 192 | | 217 |
| 0.41 | | | | | | | | 194 | 195 | 196 | 196 | | 221 |
| 0.42 | | | | | | | | | | 200 | 200 | | 225 |
| 0.43 | | | | | | | | | | | 204 | | 230 |
| 0.44 | | | | | | | | | | | | | 234 |
| 0.45 | | | | | | | | | | | | | 238 |

To convert from entrance exposure in air in Roentgen to mean glandular breast dose in millirads, multiply the entrance exposure by the factor shown in the table for the appropriate kVp and beam quality (HVL) combination. For example, a measured entrance exposure of 0.50 Roentgen from a Mo/Mo Target Filter system at 30 kVp with a measured HVL of 0.36-mm aluminum yields an average glandular dose of $(0.50 \text{ R}) \times (174 \text{ mrad/R}) = 87 \text{ mrad}$ or 0.87 mGy.

*Wu X. Breast dosimetry in screen-film mammography. In: Barnes GT, Frey GD (eds), Screen film mammography: Imaging considerations and medical physics responsibilities. Madison, WI: Medical Physics Publishing; 159-175, 1991. W/AI conversion factors are derived from fits to data from Stanton L et al. Dosage evaluation in mammography. Radiology 1984; 150:577-584.
[ARC 1401C, IAB 4/2/14, effective 5/7/14; ARC 3393C, IAB 10/11/17, effective 11/15/17]

641—41.7(136C) X-ray machines used for stereotactically guided breast biopsy.

41.7(1) Definitions. In addition to the definitions provided in rules 641—38.2(136C), 641—40.2(136C), and 641—41.1(136C), the following definitions are applicable to this rule.

“*Collaborative setting*” means a setting in which a qualified radiologist and surgeon (under 41.7(3)“a” or 41.7(3)“c”) are working together in consultation and in performing stereotactically guided breast biopsies with a common goal of the patient’s benefit.

“*Procedure*” means a stereotactically guided breast biopsy performed on a patient for diagnostic purposes.

“*Qualified training physician*” means a physician who is qualified under 41.7(3) to perform stereotactically guided breast biopsies and who has performed at least 24 procedures.

“*Stereotactically guided breast biopsy*” means a breast biopsy procedure performed with the utilization of a dedicated system which emits ionizing radiation and is designed specifically for that procedure.

“*Supervising physician*” means the physician designated by the facility/owner to:

1. Evaluate the equipment, personnel, procedures, and records annually; and
2. Establish and conduct the quality assurance program.

41.7(2) Registration and application standards and requirements.

a. Each radiation machine used to perform stereotactically guided breast biopsies shall be registered according to 641—subrule 39.3(2).

b. Each facility wishing to perform stereotactically guided breast biopsies shall apply to the agency for authorization by providing or verifying the following information for each machine:

(1) The stereotactically guided breast biopsy equipment and facility meet the general requirements of these rules for radiation machines.

(2) The radiation machine is specifically designed to perform stereotactically guided breast biopsies.

(3) The radiation machine is used according to these rules on patient radiation exposure and radiation dose levels.

(4) The radiation machine is operated by individuals meeting the requirements of this rule.

(5) The entire stereotactically guided breast biopsy system is evaluated annually by a medical physicist who meets the requirements of this rule.

(6) The equipment, personnel, procedures and records are evaluated annually by the supervising physician.

c. Suspension, revocation, or denial of authorization.

(1) Authorization may be suspended or revoked with cause if any machine does not meet one or more of the standards of these rules.

(2) The facility shall have an opportunity for a hearing in connection with a denial, suspension, or revocation of authorization.

(3) An emergency order suspending or revoking authorization may be issued if the agency finds the radiation machine or facility violates rules that seriously affect the health, safety and welfare of the public. An opportunity for hearing shall be held within 20 working days after the issuance of the order. The order shall be effective during the proceedings.

(4) If authorization is revoked, the radiation machine shall not be used until reinstated.

d. Reinstatement of authorization.

(1) An application for reinstatement shall be submitted and processed the same as an initial application.

(2) The agency shall inspect the radiation machine within 60 days of the approved reinstatement application. If the reinstatement is after a revocation, appropriate corrective action shall be submitted with the application.

(3) A full reinstatement shall be issued only after the agency has inspected the radiation machine and facility and determined that they meet the requirements of these rules.

e. Inspections. The agency shall conduct an inspection of each radiation machine no later than 14 months after initial authorization and at least annually thereafter.

41.7(3) Physicians. Physicians must be qualified according to the setting and their role in performing stereotactically guided breast biopsies as outlined below.

a. Requirements for a radiologist in a collaborative setting are as follows:

(1) Initial training and qualifications.

1. Must be qualified according to 41.6(3)“a.”

2. Shall have performed at least 12 stereotactically guided breast biopsies prior to July 1, 1998, or at least 3 hands-on stereotactically guided breast biopsies under a physician who is qualified under 41.7(3) and has performed at least 24 stereotactically guided breast biopsies.

3. Shall have at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy.

4. Shall be responsible for mammographic interpretation, be experienced as noted in 41.7(3) "a"(1)"2" above and be experienced in the specific recommendations for each biopsy and lesion identification at time of each biopsy performed by that physician.

5. Shall be responsible for the supervision of the radiologic technologist during the procedure.

(2) Maintenance of proficiency and CME requirements.

1. Perform at least 12 stereotactically guided breast biopsies per year. If experience is not maintained, the physician must requalify by performing 3 procedures under direct supervision of a qualified training physician or an agency-approved manufacturer applications specialist before resuming unsupervised procedures.

2. Obtain at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy every 36 months. If education is not maintained, the physician must requalify by obtaining additional CME credits to reach 3 CME credits in the prior 36 months before resuming unsupervised procedures. These CMEs cannot be obtained by the performance of supervised procedures.

3. Continuing qualifications must be met and a current state of Iowa medical license must be in effect whenever procedures are performed independently by the physician.

b. Requirements for a physician other than a qualified radiologist in a collaborative setting are as follows:

(1) Initial training and qualifications.

1. Must be licensed to practice medicine in Iowa.

2. Must have at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy which includes instruction on triangulation for lesion location.

3. Must have performed at least 12 stereotactically guided breast biopsies prior to May 9, 2001, or at least 3 hands-on stereotactically guided breast biopsy procedures under a physician who is both qualified to perform stereotactic biopsy procedures according to 41.7(3) and has performed at least 24 stereotactically guided breast biopsies.

4. Shall be responsible for post-biopsy management of the patient.

5. Shall be responsible for supervision of the radiologic technologist during the procedure.

(2) Maintenance of proficiency and CME requirements.

1. Perform or participate in at least 12 stereotactically guided breast biopsies per year or requalify by performing 3 procedures under direct supervision of a qualified training physician or an agency-approved manufacturer applications specialist before resuming unsupervised procedures.

2. Obtain at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy every 36 months. If education is not maintained, the physician must requalify by obtaining additional CME credits to reach 3 CME credits in the prior 36 months before resuming unsupervised procedures. These CMEs cannot be obtained by the performance of supervised procedures.

3. Continuing qualifications must be met and a current state of Iowa medical license must be in effect whenever unsupervised procedures are performed by the physician.

c. Requirements for a radiologist performing stereotactically guided breast biopsy independently are as follows:

(1) Initial training and requirements.

1. Must be qualified according to 41.6(3) "a."

2. Initially, must have at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy.

3. Initially, must obtain at least 15 hours of CME in breast imaging including benign and malignant breast diseases.

4. Must have performed at least 12 stereotactically guided breast biopsies prior to July 1, 1998, or at least 3 hands-on stereotactically guided breast biopsy procedures under a physician who is both qualified according to 41.7(3) and has performed at least 24 stereotactically guided breast biopsies.

5. Must be responsible for mammographic interpretation.

6. Must be responsible for patient selection.
7. Must be responsible for the supervision of the radiologic technologist during the procedure.
8. Must be responsible for post-biopsy management of the patient which may include referral to a surgeon for a follow-up on certain lesions.

(2) Maintenance of proficiency and CME requirements.

1. Perform at least 12 stereotactically guided breast biopsies per year or requalify by performing 3 procedures under direct supervision of a qualified training physician or an agency-approved manufacturer applications specialist.

2. Obtain at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy every 36 months which includes post-biopsy management of the patient. If education is not maintained, the physician must requalify by obtaining additional CME credits to reach 3 CME credits in the prior 36 months before resuming unsupervised procedures. These CMEs cannot be obtained by the performance of supervised procedures.

3. Continuing qualifications must be met and a current state of Iowa medical license must be in effect whenever unsupervised procedures are performed by the physician.

d. Requirements for a physician other than a qualified radiologist (under 41.7(3) "c") performing stereotactically guided breast biopsy independently are as follows:

(1) Initial training and requirements.

1. Must be licensed to practice medicine in Iowa.

2. Must have evaluated at least 480 mammograms in the prior 24 months in consultation with a physician who is qualified according to 41.6(3) "a."

3. Initially, must have at least 15 hours of Category 1 CME or 15 hours of training approved by the agency in stereotactically guided breast imaging and biopsy or three years' experience having performed at least 36 stereotactically guided breast biopsies.

4. Must have four hours of Category 1 CME in medical radiation physics.

5. Must have performed at least 12 stereotactically guided breast biopsies prior to May 9, 2001, or at least 3 hands-on stereotactically guided breast biopsy procedures under a physician who is both qualified according to 41.7(3) and has performed at least 24 stereotactically guided breast biopsies.

6. Must be responsible for patient selection.

7. Must be responsible for the supervision of the radiologic technologist during the procedure.

8. Must be responsible for post-biopsy management of the patient.

(2) Maintenance of proficiency and CME requirements.

1. Continue to evaluate at least 480 mammograms every 24 months in consultation with a physician who is qualified according to 41.6(3) "a."

2. Perform at least 12 stereotactically guided breast biopsies per year or requalify by performing 3 procedures under direct supervision of a qualified training physician or an agency-approved manufacturer applications specialist.

3. Obtain at least three hours of Category 1 CME or three hours of training approved by the agency in stereotactically guided breast biopsy every 36 months. If education is not maintained, the physician must requalify by obtaining additional CME credits to reach 3 CME credits in the prior 36 months before resuming unsupervised procedures. The CME credits for requalification cannot be obtained by performing procedures.

4. Continuing qualifications must be met and a current state of Iowa medical license must be in effect whenever unsupervised procedures are performed by the physician.

41.7(4) Medical physicist.

a. Must be qualified according to 41.6(3) "c."

b. Must have performed three hands-on stereotactically guided breast biopsy system physics surveys prior to July 1, 1998; or one hands-on stereotactically guided breast biopsy system physics survey under the guidance of a medical physicist qualified through 41.7(4) "a" and 41.7(4) "b."

c. Maintenance of proficiency and continuing education requirements.

(1) Have performed at least one stereotactically guided breast biopsy system physics survey per year after the initial qualifications are met or requalify by performing one survey supervised by a qualified medical physicist; and

(2) Following the third anniversary in which the requirements of this subrule were met, have obtained at least three hours of continuing education in stereotactically guided breast biopsy system physics during the previous 36 months or requalify by obtaining additional CME credits to reach 3 CME credits in the prior 36 months.

41.7(5) Radiologic technologist.

a. Must be qualified according to 41.6(3) "b."

b. Must meet the following initial requirements:

(1) Five hands-on stereotactically guided breast biopsy procedures on patients under the supervision of a physician or technologist qualified under rule 641—41.7(136C).

(2) Three hours of continuing education in stereotactically guided breast biopsy. The required continuing education cannot be obtained through the performance of supervised stereotactically guided breast biopsy procedures.

c. Maintenance of proficiency and continuing education and experience requirements.

(1) Following the first anniversary in which the requirements of this subrule were met, have performed at least 12 stereotactically guided breast biopsies per year or requalify by performing 3 stereotactically guided breast biopsies under the supervision of a physician or radiologic technologist qualified under 41.7(3) or 41.7(5).

(2) Following the third anniversary in which the requirements of this subrule were met, have at least three hours of continuing education in stereotactically guided breast biopsy system physics during the previous 36 months or requalify by obtaining additional CME credits to reach 3 CME credits in the prior 36 months. The CMEs cannot be obtained by the performance of supervised procedures.

(3) If a stereotactic radiologic technologist performs only stereotactic procedures, the radiologic technologist must perform at least 100 stereotactic procedures during the prior 24 months during the 24-month period ending on the last day of the previous calendar quarter, or any 24-month period between the two. In this case, all requirements for radiologic technologists must be met with the exception of 41.6(3) "b"(4)"1."

(4) Only 50 percent of the total required stereotactic continuing education hours may be obtained through presenting or acting as a trainer for a continuing education or training program.

41.7(6) Obtaining and preserving records.

a. The facility must make, for each procedure, a record of the service provided including:

(1) The date of the procedure.

(2) The name of the patient and one additional patient identifier.

(3) The name of the radiologic technologists and physicians performing the procedure.

(4) A description of the service provided.

(5) The name of the referring physician, if any.

b. Records retained by the medical facility must be retained for at least ten years.

41.7(7) Quality assurance program.

a. The facility shall have an equipment quality assurance program specific to stereotactically guided breast biopsy systems and covering all components of the system to ensure high-quality images with minimum patient exposure.

b. The facility shall ensure that a general review of the program is conducted at least annually and have available the services of a qualified medical physicist who is capable of establishing and conducting the program.

c. The facility shall name a supervising stereotactic biopsy physician who shall be responsible for:

(1) Quality assurance activities including the medical audit,

(2) Oversight of the quality control program, and

(3) Supervision of the radiologic technologist(s) and the medical physicist.

d. Under the direction of the supervising physician, the medical physicist shall have the responsibility for establishing and conducting the equipment quality assurance program. The program shall include:

(1) Conducting equipment performance monitoring functions, initially and then at least annually, to include:

1. Evaluation of biopsy unit assembly. Any failed items must be corrected within 30 days of the survey unless the medical physicist deems that the failure poses a serious injury risk to the patient, at which time the failure needs to be corrected before further procedures are performed.

2. Collimation.

- Digital – X-ray field must not extend beyond the image receptor by more than 5 mm on any side.

- Film-screen – On all sides other than the chest wall side, the X-ray field must be within the image receptor. The chest wall side must not extend beyond the image receptor by more than 2 percent.

- Any failures must be corrected within 30 days of the survey.

3. Evaluation of focal spot.

- Digital – Focal spot must not degrade from initial measurement. If reduction in lp/mm is found, focal spot must be corrected within 30 days of survey.

- Film-screen – Film-screen must show 13 lp/mm parallel to the anode-cathode axis and 11 lp/mm perpendicular to the anode-cathode axis. Failure to meet the performance criteria must be corrected within 30 days of survey.

4. kVp accuracy/reproducibility. kVp accuracy/reproducibility must be accurate to within +/- 5% of nominal kVp setting. Failures must be corrected before further procedures are performed.

5. Half-value layer measurement. HVL shall be greater than kVp/100 (in units of mm Al). Failures must be corrected before further procedures are performed.

6. Exposure reproducibility. Exposure must be reproducible to within +/- 15% of mean exposure. Failures must be corrected before further procedures are performed.

7. Breast entrance exposure, average glandular dose. Average glandular dose must be less than 300 millirad (3 milliGray) per exposure of a 50 percent glandular/50 percent adipose 4.5 centimeter breast. Failures must be corrected before further procedures are performed.

8. Image quality evaluation.

- Digital – Phantom image must meet the criteria of 5 fibers, 4 speck groups and 3 masses for the ACR accreditation phantom or 3 fibers, 3 speck groups and 2.5 masses for the mini phantom unless otherwise stated by the phantom manufacturer.

- Film-screen – Phantom image must meet the criteria of 4 fibers, 3 speck groups and 3 masses for the ACR phantom or 2 fibers, 2 speck groups and 2 masses for the mini phantom unless otherwise stated by the phantom manufacturer. The background density must be within +/- .20 of the established aim, and the density differences must be within +/- .05 of the established aim.

- Failures must be corrected before further procedures are performed.

9. Artifact evaluation. Any significant black or white artifacts seen in the image detector field must be corrected within 30 days of the survey.

10. Digital field uniformity. For units with region of interest (ROI) capability, the SNR in each corner must be within +/- 15% of the SNR in the center. Failures must be corrected within 30 days of the survey.

11. Localization simulation (gelatin phantom) test. Localization accuracy must be within 1 mm of target, and the test must include a portion of the test “lesion” in the sample chamber. Failures must be corrected before further procedures are performed.

(2) Analyzing the monitoring results to determine if there are any problems requiring correction.

(3) Ensuring that the facility has procedures in place for carrying out or arranging for the necessary corrective actions as well as for the calibrations and other preventative maintenance.

e. The supervising physician shall have the responsibility for establishing and conducting the quality control program in a facility with a fixed unit. In the case of a mobile stereotactic unit, the

owner or designee shall assume the responsibility for establishing and conducting the quality assurance program. The program shall include:

(1) Localization accuracy (daily before use and before using the localization unit after it is adjusted). Each coordinate must be within manufacturer specifications for the intended target value. Failures must be corrected before further procedures are performed.

(2) Visual checklist (monthly). Any failed items must be corrected within 30 days.

(3) Phantom image (weekly). Phantom image must meet the criteria of 5 fibers, 4 speck groups and 3 masses for the ACR accreditation phantom or 3 fibers, 3 speck groups and 2.5 masses for the mini phantom unless otherwise stated by the phantom manufacturer. Failures must be corrected before further procedures are performed.

(4) Compression (semiannually). The maximum auto drive compression force shall not exceed 45 pounds. Failures must be corrected within 30 days.

(5) Any additional quality control testing indicated by the stereotactic breast biopsy unit manufacturer must be completed as outlined in the quality control manual applicable to the unit.

f. Each facility shall establish a medical audit program to ensure the accuracy and appropriateness of the procedures performed. This program shall include an imaging-pathology correlation for each biopsy performed, an ongoing analysis of biopsy results and periodic review of the utilization of the procedure. The program must include the number of biopsies performed, the number of cancers found, the number of benign lesions found, and the number of biopsies repeated.

g. Additional medical physicist evaluations of stereotactic units shall be conducted whenever a new unit is installed, a unit is disassembled and reassembled at the same or a new location, or major components of a stereotactic unit are changed or repaired. These evaluations shall be used to determine whether the new or changed equipment meets the requirements of applicable standards in 41.7(7). All problems shall be corrected before the new or changed equipment is put into service for examinations. The stereotactic equipment evaluation shall be performed by a medical physicist qualified under 41.7(4) or by an individual under the direct supervision of a medical physicist qualified under 41.7(4).

41.7(8) *Equipment standards.*

a. Be specifically designed for stereotactically guided breast biopsy.

b. Meet the Food and Drug Administration (FDA) standards found in 21 CFR.

41.7(9) *Safety standards.*

a. Proper safety precautions shall be maintained and shall include, but not be limited to, adequate shielding for patients, personnel and facilities. The equipment shall be operated only from a shielded position.

b. Equipment operators shall wear personnel monitors to monitor their radiation exposure.

c. Annual inspections shall be conducted by an inspector from the agency to ensure compliance with these rules. Identified hazards shall be promptly corrected.

d. Equipment shall be shockproof and grounded to protect against electrical hazards.

e. Records of all inspections, reports and consultations shall be maintained for at least seven years.

This rule is intended to implement Iowa Code chapter 136C.

[ARC 1401C, IAB 4/2/14, effective 5/7/14]

CHAPTER 41—APPENDIX A

INFORMATION ON RADIATION SHIELDING
REQUIRED FOR PLAN REVIEWS (EXCLUDING THERAPY MACHINES)

In order for the agency to provide an evaluation and verification that national standards have been met on shielding requirements for a radiation installation, the following information shall be submitted.

1. The plans should show, as a minimum, the following:

(a) The normal location of the X-ray system's radiation port; the port's travel and traverse limits; general direction(s) of the useful beam; locations of any windows and doors; the location of the operator's booth; and the location of the X-ray control panel.

(b) The structural composition and thickness or lead equivalent of all walls, doors, partitions, floor, and ceiling of the room(s) concerned.

(c) The dimensions of the room(s) concerned.

(d) The type of occupancy of all adjacent areas inclusive of space above and below the room(s) concerned. If there is an exterior wall, show distance to the closest area(s) where it is likely that individuals may be present.

(e) The make and model of the X-ray equipment, the energy waveform (single phase, three phase, etc.) and the maximum technique factors.

(f) The type of examination(s) or treatment(s) which will be performed with the equipment.

2. Information on the anticipated workload of the X-ray system(s) in mA-minutes per week.

3. If the services of a qualified expert have been utilized to determine the shielding requirements, a report, including all basic assumptions used, shall be submitted with the plans.

CHAPTER 41—APPENDIX B

DESIGN REQUIREMENTS FOR AN
OPERATOR'S BOOTH1. Space requirements:

(a) The operator shall be allotted not less than 7.5 square feet (0.697 m) of unobstructed floor space in the booth.

(b) The operator's booth may be any geometric configuration with no dimension of less than 2 feet (0.61 m).

(c) The space shall be allotted excluding any encumbrance by the X-ray control panel, such as overhang, cables, or other similar encroachments.

(d) The booth shall be located or constructed such that unattenuated direct scatter radiation originating on the examination table or at the wall cassette will not reach the operator's station in the booth.

2. Structural requirements:

(a) The booth walls shall be permanently fixed barriers of at least 7 feet (2.13 m) high.

(b) When a door or movable panel is used as an integral part of the booth structure, it must have an interlock which will prevent an exposure when the door or panel is not closed.

(c) Shielding shall be provided to meet the requirements of 641—Chapter 40.

3. X-ray control placement:

The X-ray control for the system shall be fixed within the booth; and

(a) Shall be at least 40 inches (1.02 m) from any point subject to direct scatter, leakage or primary beam radiation.

(b) Shall allow the operator to use the majority of the available viewing windows or mirrors.

4. Viewing system requirements:

(a) Each booth shall have at least one viewing device which will:

(1) Be so placed that the operator can view the patient during any exposure, and

(2) The device shall be so placed that the operator can have full view of any occupant of the room and should be so placed that the operator can view any entry into the room. If any door which allows access to the room cannot be seen from the booth, then outside that door there shall be an "X-ray" warning sign that will be lighted anytime the rotor of the X-ray tube is activated. Alternatively, that door must have an interlock controlling the exposure which will prevent the exposure if the door is not closed.

(b) When the viewing system is a window, the following requirements also apply:

(1) The viewing area shall be at least 1 square foot (0.0929 m²).

(2) Regardless of size or shape, at least 0.09 m² (1 sq ft) of window area must be centered no less than 0.6 m (2 feet) from the open edge of the booth and no less than 1.5 m (5.0 feet) from the floor.

(3) The material constituting the window shall have the same lead equivalence as that required in the booth's wall in which it is mounted.

(c) When the viewing system is by mirrors, the mirror(s) shall be so located as to accomplish the general requirements of Appendix B, 4(a).

(d) When the viewing system is by electronic means:

(1) The camera shall be so located as to accomplish the general requirements of Appendix B, 4(a), and

(2) There shall be an alternate viewing system as a backup for the primary system.

CHAPTER 41—APPENDIX C

INFORMATION TO BE SUBMITTED BY PERSONS
PROPOSING TO CONDUCT HEALING
ARTS SCREENING

Persons requesting that the agency approve a healing arts screening program shall submit the following information and evaluation:

1. Name and address of the applicant and, where applicable, the names and addresses of agents within this state.

2. Diseases or conditions for which the X-ray examinations are to be used in diagnoses.

3. A detailed description of the X-ray examinations proposed in the screening program.

4. Description of the population to be examined in the screening program, i.e., age, sex, physical condition, and other appropriate information. Any person conducting a screening program for cardiac scoring shall conduct screening only on either women over age 45 or men over age 50 who meet any two of the following criteria: family history, smoker, high blood pressure, high cholesterol, obesity (at least 20 pounds overweight), diabetes.

5. An evaluation of any known alternate methods not involving ionizing radiation which could achieve the goals of the screening program and why these methods are not used instead of the X-ray examinations.

6. An evaluation by a qualified expert of the X-ray system(s) to be used in the screening program. The evaluation by the qualified expert shall show that such system(s) does satisfy all requirements of these regulations. The evaluation shall include a measurement of patient exposures from the X-ray examinations to be performed.

7. A description of the diagnostic film quality control program.

8. A copy of the technique chart for the X-ray examination procedures to be used.

9. The qualifications of each individual who will be operating the X-ray system(s).

10. The qualifications of the individual who will be supervising the operators of the X-ray system(s). The extent of supervision and the method of work performance evaluation shall be specified.

11. The name and address of the physician who will interpret the radiograph(s) and a copy of the physician's license to practice in Iowa.

12. A description of the procedures to be used in advising the individuals screened and their private practitioners of the healing arts of the results of the screening procedure and any further medical needs indicated.

13. A description of the procedures for the retention or disposition of the radiographs and other records pertaining to the X-ray examinations.

14. An indication of the frequency of screening and the duration of the entire screening program.

15. Documentation justifying the reason for the screening. The applicant must submit data which supports the efficacy of the screening test in diagnosing the disease or condition being screened. Data which will be acceptable to the department includes, but is not limited to, the following: (1) the recommendation of a nationally recognized certifying medical or government body; (2) the recommendation of one of the following national organizations: American Cancer Association, American Lung Association, American Heart Association; or (3) medical literature from peer-reviewed journals supporting the screening.

16. The procedures for preventing pregnant individuals from participating in the screening or justification for allowing pregnant individuals to participate.

17. The dates of the screening to include beginning and ending dates.

18. A copy of IRB for a research project or information justifying the research project.

CHAPTER 41—APPENDIX D

QA for Therapeutic Radiation Machines

| Frequency | Procedure | Tolerance ^a |
|---|---|---|
| Daily | <u>Dosimetry</u> | |
| | X-ray output constancy | 3% |
| | Electron output constancy ^b | 3% |
| | <u>Mechanical</u> | |
| | Localizing lasers | 2mm |
| | Distance indicator (ODI) | 2mm |
| | <u>Safety</u> | |
| | Door interlocks | functional |
| | Audiovisual monitors | functional |
| | Monthly | <u>Dosimetry</u> |
| X-ray output constancy ^c | | 2% |
| Electron output constancy ^c | | 2% |
| Backup monitor constancy | | 2% |
| X-ray central axis dosimetry parameter (PDD, TAR) constancy | | 2% |
| Electron central axis dosimetry parameter constancy (PDD) | | 2mm @ therapeutic depth |
| X-ray beam flatness constancy | | 2% |
| Electron beam flatness constancy | | 3% |
| X-ray and electron symmetry | | 3% |
| <u>Safety Interlocks</u> | | |
| Wedge, electron cone interlocks | | functional |
| <u>Mechanical</u> | | |
| Light/radiation field coincidence | | 2mm or 1% on a side ^d |
| Gantry/collimator angle indicators | | 1 degree |
| Wedge position | | 2mm (or 2% change in transmission factor) |
| Tray position | | 2mm |
| Applicator position | | 2mm |
| Field size indicators | | 2mm |
| Cross-hair centering | | 2mm diameter |
| Treatment couch position indicators | | 2mm/1deg |
| Latching of wedges, blocking tray | functional | |
| Jaw symmetry ^e | 2mm | |
| Field Light intensity | functional | |
| Annual | <u>Dosimetry</u> | |
| | X-ray/electron output calibration constancy | 2% |
| | Field size dependence of X-ray output constancy | 2% |

^a The tolerances listed in the tables should be interpreted to mean that if a parameter either: (1) exceeds the tabulated value (e.g., the measured isocenter under the gantry exceeds 2 mm diameter); or (2) that the change in the parameter exceeds the nominal value (e.g., the output changes by more than 2%), then an action is required. The distinction is emphasized by the use of the term constancy for the latter case. Moreover, for constancy, percent values \pm the deviation of the parameter with respect to its nominal value; distances are referenced to the isocenter or nominal SSD.

^b All electron energies need not be checked daily, but all electron energies are to be checked at least twice weekly.

^c A constancy check with a field instrument using temperature pressure corrections.

^d Whichever is greater. Should also be checked after change of light field source.

^e Jaw symmetry is defined as the difference in distance of each jaw from the isocenter.

| Frequency | Procedure | Tolerance ^a |
|-----------|--|------------------------|
| | Output factor constancy for electron applicators | 2% |
| | Central axis parameter constancy (PDD, TAR) | 2% |
| | Off-axis factor constancy | 2% |
| | Transmission factor constancy for all treatment accessories | 2% |
| | Wedge transmission factor constancy ^f | 2% |
| | Monitor chamber linearity | 1% |
| | X-ray output constancy vs. gantry angle | 2% |
| | Electron output constancy vs. gantry angle | 2% |
| | Off-axis factor constancy vs. gantry angle | 2% |
| | Arc mode | Mfrs. specs. |
| | <u>Safety Interlocks</u> | |
| | Follow manufacturer's test procedures | functional |
| | <u>Mechanical</u> | |
| | Collimator rotation isocenter | 2mm diameter |
| | Gantry rotation isocenter | 2mm diameter |
| | Couch rotation isocenter | 2mm diameter |
| | Coincidence of collimetry, gantry, couch axes with isocenter | 2mm diameter |
| | Coincidence of radiation and mechanical isocenter | 2mm diameter |

^f Most wedges' transmission factors are field size and depth dependent.

^a The tolerances listed in the tables should be interpreted to mean that if a parameter either: (1) exceeds the tabulated value (e.g., the measured isocenter under the gantry exceeds 2 mm diameter); or (2) that the change in the parameter exceeds the nominal value (e.g., the output changes by more than 2%), then an action is required. The distinction is emphasized by the use of the term constancy for the latter case. Moreover, for constancy, percent values \pm the deviation of the parameter with respect to its nominal value; distances are referenced to the isocenter or nominal SSD.

CHAPTER 41—APPENDIX E

INFORMATION ON RADIATION SHIELDING REQUIRED
FOR PLAN REVIEWS FOR THERAPY MACHINES

I. All therapeutic radiation machines.

A. Basic facility information including: name, telephone number and agency registration number of the individual responsible for preparation of the shielding plan; name and telephone number of the facility supervisor; and the street address (including room number if applicable) of the external beam radiation therapy facility. The plan should also indicate whether this is a new structure or a modification to existing structure(s).

B. All wall, floor, and ceiling areas struck by the useful beam shall have primary barriers.

C. Secondary barriers shall be provided in all wall, floor, and ceiling areas not having primary barriers.

II. Therapeutic machines up to 150 kV (photons only).

In addition to the requirements listed in Section I above, therapeutic radiation machine facilities which produce only photons with a maximum energy less than or equal to 150 kV shall submit shielding plans which contain, as a minimum, the following additional information:

A. Equipment specifications, including the manufacturer and model number of the therapeutic radiation machine, as well as the maximum technique factors.

B. Maximum design workload for the facility including total weekly radiation output (expressed in gray (rad) or air kerma at one meter), total beam-on time per day or week, the average treatment time per patient, along with the anticipated number of patients to be treated per day or week.

C. A facility blueprint/drawing indicating: scale (0.25 inch = 1 foot is typical); direction of north; normal location of the therapeutic radiation machine's radiation port(s); the port's travel and traverse limits; general direction(s) of the useful beam; locations of any windows and doors; and the location of the therapeutic radiation machine control panel. If the control panel is located inside the external beam radiation therapy treatment room, the location of the operator's booth shall be noted on the plan and the operator's station at the control panel shall be behind a protective barrier sufficient to ensure compliance with 641—40.15(136C).

D. The structural composition and thickness or lead/concrete equivalent of all walls, doors, partitions, floor, and ceiling of the room(s) concerned.

E. The type of occupancy of all adjacent areas inclusive of space above and below the room(s) concerned. If there is an exterior wall, show distance to the closest area(s) where it is likely that individuals may be present.

F. At least one example calculation which shows the methodology used to determine the amount of shielding required for each physical condition (i.e., primary and secondary leakage barriers, restricted and unrestricted areas, entry door(s)) and shielding material in the facility.

(1) If commercial software is used to generate shielding requirements, identify the software used and the version/revision date.

(2) If the software used to generate shielding requirements is not in the open literature, submit quality control sample calculations to verify the result obtained with the software.

III. Therapeutic radiation machines over 150 kV.

In addition to the requirements listed in Section I above, therapeutic radiation machine facilities which produce photons or electrons with a maximum energy in excess of 150 kV or electrons shall submit shielding plans which contain, as a minimum, the following additional information:

A. Equipment specifications including the manufacturer and model number of the therapeutic radiation machine, and gray (rad) at the isocenter and the energy(s) and type(s) of radiation produced (i.e., photon, electron). The target to isocenter distance shall be specified.

B. Maximum design workload for the facility including total weekly radiation output (expressed in gray (rad) at one meter), total beam-on time per day or week, the average treatment time per patient, along with the anticipated number of patients to be treated per day or week.

C. Facility blueprint/drawing (including both floor plan and elevation views) indicating relative orientation of the therapeutic radiation machine, scale (0.25 inch = 1 foot is typical), type(s), thickness and minimum density of shielding material(s), direction of north, the locations and size of all penetrations through each shielding barrier (ceiling, walls and floor), as well as details of the door(s) and maze.

D. The structural composition and thickness or concrete equivalent of all walls, doors, partitions, floor, and ceiling of the room(s) concerned.

E. The type of occupancy of all adjacent areas inclusive of space above and below the room(s) concerned. If there is an exterior wall, show distance to the closest area(s) where it is likely that individuals may be present.

F. Description of all assumptions that were in shielding calculations including, but not limited to, design energy (i.e., room may be designed for 6 MV unit although only a 4 MV unit is currently proposed), workload, presence of integral beam-stop in unit, occupancy and use(s) of adjacent areas, fraction of time that useful beam will intercept each permanent barrier (walls, floor and ceiling) and “allowed” radiation exposure in both restricted and unrestricted areas.

G. At least one example calculation which shows the methodology used to determine the amount of shielding required for each physical condition (i.e., primary and secondary leakage barriers, restricted and unrestricted areas, small angle scatter, entry door(s) and maze) and shielding material in the facility.

(1) If commercial software is used to generate shielding requirements, also identify the software used and the version/revision date.

(2) If the software used to generate shielding requirements is not in the open literature, submit quality control sample calculations to verify the result obtained with the software.

IV. Neutron shielding.

In addition to the requirements listed in Section III above, therapeutic radiation machine facilities which are capable of operating above 10 MV shall submit shielding plans which contain, as a minimum, the following additional information:

A. The structural composition, thickness, minimum density and location of all neutron shielding material.

B. Description of all assumptions that were used in neutron shielding calculations including, but not limited to, neutron spectra as a function of energy, neutron fluency rate, absorbed dose and dose equivalent (due to neutrons) in both restricted and unrestricted areas.

C. At least one example calculation which shows the methodology used to determine the amount of neutron shielding required for each physical condition (i.e., restricted and unrestricted areas, entry door(s) and maze) and neutron shielding material utilized in the facility.

(1) If commercial software is used to generate shielding requirements, also identify the software used and the version/revision date.

(2) If the software used to generate shielding requirements is not in the open literature, submit quality control sample calculations to verify the result obtained with the software.

D. The method(s) and instrumentation which will be used to verify the adequacy of all neutron shielding installed in the facility.

V. References.

A. NCRP Report 49, “Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies Up to 10 MeV” (1976).

B. NCRP Report 51, “Radiation Protection Design Guidelines for 0.1-100 MeV Particle Accelerator Facilities” (1977).

C. NCRP Report 79, “Neutron Contamination from Medical Electron Accelerator” (1984).

D. NCRP Report 144, “Radiation Protection for Particle Accelerator Facilities” (2003).

These rules are intended to implement Iowa Code chapter 136C.

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[◇] Two or more ARCs

CHAPTER 45
RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL
RADIOGRAPHIC OPERATIONS

[Prior to 8/5/92, see 641—41.4(136C)]

641—45.1(136C) General requirements for industrial radiography operations.

45.1(1) Purpose and scope.

a. The rules in this chapter establish radiation safety requirements for using sources of radiation for industrial radiography. The requirements of this chapter are in addition to, and not in substitution for, other applicable requirements of 641—Chapters 38, 39, and 40. The rules in this chapter apply to all licensees or registrants who use sources of radiation for industrial radiography.

b. All references to any Code of Federal Regulations (CFR) in this chapter are those in effect as of May 16, 2018.

45.1(2) Definitions. For the purpose of this chapter, the definitions of 641—Chapter 38 may also apply. As used in this chapter, the following definitions apply:

“*Annual refresher safety training*” means a review conducted or provided by the licensee for its employees on radiation safety aspects of industrial radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, new or revised regulations, accidents or errors that have been observed, and should also provide opportunities for employees to ask safety questions.

“*Associated equipment*” means equipment that is used in conjunction with a radiographic exposure device to make radiographic exposures that drives, guides, or comes in contact with the source, e.g., guide tube, control tube, control (drive) cable, removable source stop, “J” tube and collimator when it is used as an exposure head.

“*Cabinet X-ray system*” means an X-ray system with the X-ray tube installed in an enclosure independent of existing architectural structures except the floor on which it may be placed. The cabinet X-ray system is intended to:

1. Contain at least that portion of a material being irradiated;
2. Provide radiation attenuation; and
3. Exclude personnel from its interior during generation of radiation. Included are all X-ray systems designed primarily for the inspection of carry-on baggage at airline, railroad, and bus terminals, and in similar facilities. An X-ray tube used within a shielded part of a building, or X-ray equipment which may temporarily or occasionally incorporate portable shielding, is not considered a cabinet X-ray system.

“*Certifiable cabinet X-ray system*” means an existing uncertified X-ray system that has been modified to meet certification requirements specified in 21 CFR 1020.40.

“*Certified cabinet X-ray system*” means an X-ray system which has been certified in accordance with 21 CFR 1010.2 as being manufactured and assembled pursuant to the provisions of 21 CFR 1020.40.

“*Certifying entity*” means an independent certifying organization meeting the requirements of Appendix A in 10 CFR Part 34 or an agreement state meeting the requirements in Appendix A, Parts II and III of 10 CFR Part 34.

“*Collimator*” means a small radiation shield of lead or other heavy metal that is placed on the end of a guide tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.

“*Control (drive) cable*” means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

“*Control drive mechanism*” means a device that enables the source assembly to be moved to and from the exposure device.

“*Control tube*” means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

“*Crank-out device*” means the cable, protective sheath, and handcrank used to move the sealed source from the shielded to the unshielded position to make an industrial radiographic exposure.

“Enclosed radiography” means industrial radiography conducted in an enclosed cabinet or room and includes cabinet radiography and shielded-room radiography.

“Exposure head” means a device that locates the gamma radiography sealed source in the selected working position. (An exposure head is also known as a source stop.)

“Field station” means a facility where licensed material may be stored or used and from which equipment is dispatched.

“Fluoroscopic imaging assembly” means a subsystem in which X-ray photons produce a fluoroscopic image. It includes the image receptors such as the image intensifier and spot-film device, electrical interlocks, if any, and structural material providing linkage between the image receptor and source assembly.

“GED” means general educational development.

“Guide tube (projection sheath)” means a flexible or rigid tube (i.e., “J” tube) for guiding the source assembly and the attached control cable from the exposure device to the exposure head. The guide tube may also include the connections necessary for attachment to the exposure device and to the exposure head.

“Hands-on experience” means experience in all of those areas considered to be directly involved in the radiography process.

“I.D. card” means the document issued by the agency, another agreement state, a licensing state, or third-party certification to industrial radiographers following completion of requirements stated in 45.1(10)“b.”

“Independent certifying organization” means an independent organization that meets all of the criteria of Appendix A in 10 CFR Part 34.

“Lay-barge radiography” means industrial radiography performed on any water vessel used for laying pipe.

“Lixiscope” means a portable light-intensified imaging device using a sealed source.

“Lock-out survey” means a radiation survey performed to verify that a sealed source is in its shielded position. The lock-out survey is performed before moving the radiographic exposure device or source changer to a new location or when securing the radiographic exposure device or source changer.

“Minimal threat” means that during the operations of electronic devices capable of generating or emitting fields of radiation:

1. No deliberate exposure of an individual occurs;
2. The radiation is not emitted in an open beam configuration; and
3. No known physical injury to an individual has occurred.

“Offshore” means within the territorial waters of the United States.

“Offshore platform radiography” means industrial radiography conducted from an offshore platform over a body of water.

“Permanent radiographic installation” means an enclosed shielded room, cell, or vault, not located at a temporary job site, in which radiography is performed.

“Practical examination” means a demonstration through practical application of the safety rules and principles in industrial radiography including use of all appropriate equipment and procedures.

“Radiation safety officer” means an individual named by the licensee or registrant who has a knowledge of, responsibility for, and authority to enforce appropriate radiation protection rules, standards, and practices on behalf of the licensee or registrant and who meets the requirements of 45.1(10)“d.”

“Radiographer” means any individual who has successfully completed the training, testing, and documentation requirements of 45.1(10)“b,” who performs or personally supervises industrial radiographic operations, and is responsible to the licensee or registrant for ensuring compliance with the requirement of these rules and all license and certificate of registration conditions.

“Radiographer certification” means written approval received from a certifying entity stating that an individual has satisfactorily met certain established radiation safety, testing, and experience criteria.

“*Radiographer’s assistant*” means any individual who has successfully completed the training, testing, and documentation requirements of 45.1(10)“a” and who uses sources of radiation and related handling tools or radiation survey instruments under the direct supervision of a radiographer trainer.

“*Radiographer trainer (instructor)*” means any individual who instructs and supervises radiographer’s assistants during on-the-job training and who meets the requirements of 45.1(10)“c.”

“*Radiographic exposure device*” (also called a camera or a projector) means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved or otherwise changed from a shielded to unshielded position for purposes of making a radiographic exposure, or any other X-ray industrial system whereby a permanent or semipermanent image is recorded on an image receptor by action of ionizing radiation.

“*Radiographic operations*” means all activities associated with the presence of radioactive sources or radiation in a radiographic exposure device during use of the device or transport (except when being transported by a common or contract transport), to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

“*Radiographic personnel*” means any radiographer or radiographer’s assistant.

“*Residential location*” means any area where structures in which people lodge or live are located, and the grounds on which such structures are located including, but not limited to, houses, apartments, condominiums, and garages.

“*Shielded position*” means the location within the radiographic exposure device or source changer where the sealed source is secured and restricted from movement.

“*Shielded-room radiography*” means industrial radiography conducted in a room shielded so that radiation levels at every location on the exterior meet the limitations specified in 641—40.26(136C).

“*Source assembly*” means an assembly that consists of the sealed source and a connector that attaches the source to the control cable. The source assembly may also include a stop ball used to secure the source in the shielded position.

“*Source changer*” means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those source changers also used for transporting and storage of sealed sources.

“*Source container*” means a shielded device in which sealed sources are secured, transported, and stored.

“*Storage area*” means any location, facility, or vehicle which is used to store, to transport, or to secure a radiographic exposure device, a storage container, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with, or unauthorized removal of the device, container, or source.

“*Storage container*” means a container in which sealed sources are secured and stored.

“*S-tube*” means a tube through which the radioactive source travels when inside a radiographic exposure device.

“*Temporary job site*” means any location where radiographic operations are conducted and where licensed material may be stored other than the location(s) listed in a specific license or certificate of registration.

“*Trainee status card*” means the document issued by the agency following completion of the requirements of 45.1(10)“a”(1) and (2).

“*Transport container*” means a package that is designed to provide radiation safety and security when sealed sources are transported and which meets all applicable requirements of the U.S. Department of Transportation.

“*Underwater radiography*” means industrial radiography performed when the radiographic exposure device and related equipment are beneath the surface of the water.

45.1(3) Exemptions.

a. Uses of certified and certifiable cabinet X-ray systems designed to exclude individuals are exempt from the requirements of this chapter, except for the requirements of 45.2(6)“b” and “c.”

b. Industrial uses of lixiscopes are exempt from the requirements in this chapter.

c. Radiation machines determined by the agency to constitute a minimal threat to human health and safety in accordance with 641—subrule 38.3(1) are exempt from the rules in this chapter, except for the requirements of this subrule.

45.1(4) Receipt, transfer, and disposal of sources of radiation. Each licensee and registrant shall maintain records showing the receipt, transfer, and disposal of sealed sources and devices using DU for shielding and machine-produced sources of radiation. These records shall include the date, the name of the individual making the record, the radionuclide, number of curies or mass (for DU), and the make, model, and serial number of each source of radiation and device, as appropriate. Records shall be maintained for three years after they are made.

45.1(5) Radiation survey instruments.

a. The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments at each location where sources of radiation are present to make physical radiation surveys as required by this chapter and 641—subrule 40.36(1). Instrumentation required by this subrule shall have a range such that 2 millirems (0.02 millisievert) per hour through 1 rem (0.01 sievert) per hour can be measured.

b. Notwithstanding the requirements of 641—subrule 40.36(3) each radiation survey instrument shall be calibrated:

(1) At energies appropriate for use and at intervals not to exceed six months and after each instrument servicing;

(2) Such that accuracy within plus or minus 20 percent of the calibration source can be demonstrated at each point checked;

(3) At 2 points located approximately 1/3 and 2/3 of full-scale on each scale for linear scale instruments; at midrange of each decade, and at 2 points of at least 1 decade for logarithmic scale instruments; and at 3 points between 2 and 1000 mrem per hour for digital instruments; and

(4) By a person licensed or registered by the agency, another agreement state, or the U.S. Nuclear Regulatory Commission to perform such service.

c. Records of these calibrations shall be maintained for three years after the calibration date for inspection by the agency.

d. Each radiation survey instrument shall be checked with a radiation source at the beginning of each day of use and at the beginning of each work shift to ensure it is operating properly.

45.1(6) Quarterly inventory. Each licensee shall conduct a physical inventory at intervals not to exceed three months to account for all sealed sources and radiography exposure devices received and possessed. Sources of radiation include radiographic exposure devices containing depleted uranium. The records of the inventories shall be maintained for three years from the date of the inventory for inspection by the agency and shall include: the manufacturer, model number, serial number, radionuclide, number of curies, and location of each source of radiation; number of kilograms of depleted uranium shielding; date of the inventory; and name of the individual making the inventory.

45.1(7) Utilization logs.

a. Each licensee shall maintain utilization logs of the use of each sealed source. The logs shall include:

(1) A unique description, which includes the make, model, and serial number of each radiographic exposure device containing a sealed source or transport or storage container in which the sealed source is located;

(2) The identity and signature of the radiographer to whom the sealed source is assigned;

(3) The plant or site where each sealed source is used and the date of use; and

(4) The date(s) each sealed source is removed from storage and returned to storage.

b. Each registrant shall maintain current logs of the use of each source of radiation. The logs shall include:

(1) A unique identification, which includes the make, model and serial number of each source of radiation;

(2) The identity of the radiographer using the source of radiation;

(3) The date(s) each source of radiation is energized or used and the number of exposures made.

c. Utilization logs may be kept on clear, legible records containing all the information required by 45.1(7) “a” or “b.” Copies of utilization logs shall be maintained for agency inspection for three years from the date of the recorded event. The records shall be kept at the location specified by the license or certificate of registration.

45.1(8) *Inspection and maintenance.*

a. Each licensee or registrant shall perform visual and operability checks on survey meters, radiographic exposure devices, transport and storage containers, associated equipment and source changers before use on each day the equipment is to be used to ensure that the equipment is in good working condition, that the sources are adequately shielded, and that required labeling is present. Survey instrument operability must be performed using check sources or other appropriate means.

b. Each licensee or registrant shall have written procedures and conduct a program, at intervals not to exceed three months, or prior to the first use thereafter, of inspection and maintenance of radiation machines, radiographic exposure devices, transport and storage containers, source changers, survey instruments, and associated equipment to ensure proper functioning of components important to safety. All appropriate parts shall be maintained in accordance with manufacturer’s specifications. Replacement components shall meet design specifications. This program shall cover, as a minimum, the items in Appendix B of this chapter.

c. Each licensee shall have a program and written procedures for the inspection and maintenance necessary to maintain the Type B packaging used to transport radioactive materials. The program must include procedures to ensure that Type B packages are shipped and maintained in accordance with the certificate of compliance or other approval.

d. If equipment problems are found, the equipment must be removed from service until repaired.

e. The record of equipment problems and of any maintenance performed under 45.1(8) must be retained for three years after the record is made. The record must include the date of check or inspection, name of inspector, equipment involved, any problems found, and what repair or maintenance, if any, was performed.

45.1(9) *Permanent radiographic installations.* Permanent radiographic installations having high radiation area entrance controls of the type described in 641—paragraphs 40.42(1) “b” and “c” shall also meet the following requirements:

a. Each entrance that is used for personnel access to the high radiation area shall have both visible and audible warning signals to warn of the presence of radiation. The visible signal shall be activated by radiation. The audible signal shall be activated when an attempt is made to enter the installation while the source is exposed.

b. The control device or alarm system shall be tested for proper operation at the beginning of each day of equipment use. If a control device or alarm system is operating improperly, it shall be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Records of these tests shall be maintained for inspection by the agency for three years from the date of the event.

45.1(10) *Training and testing for radiographic personnel.*

a. Radiographer’s assistant requirements. No licensee or registrant shall permit any individual to act as a radiographer’s assistant, as defined in this chapter, until:

(1) It has been documented on the appropriate agency form or equivalent that such individual has received copies of and has demonstrated an understanding of:

1. The subjects outlined in Appendix A, presented in a 40-hour course approved by the agency, another agreement state, or the U.S. Nuclear Regulatory Commission;

2. The rules contained in this chapter and the applicable sections of 641—Chapter 38, the applicable U.S. Department of Transportation and NRC transportation regulations in 641—Chapter 39, and 641—Chapter 40;

3. The appropriate conditions of license(s) or certificate(s) of registration;

4. The licensee’s or registrant’s operating and emergency procedures;

5. And developed competence to use, under the personal supervision of the radiographer, the licensee’s or registrant’s radiographic exposure devices, sealed sources, associated equipment, and radiation survey instruments that the assistant will use;

6. And has demonstrated competence in the use of radiographic exposure devices, sources, survey instruments and associated equipment described in 45.1(10)“a”(1) by successful completion of a practical examination covering this material.

(2) The individual possesses a current agency-issued trainee status card issued after completion of 45.1(10)“a”(1). Trainee status will be granted only once for each individual and is valid for no longer than two years.

b. Radiographer requirements. No licensee or registrant shall permit any individual to act as a radiographer:

(1) Until it has been documented to the agency that such individual:

1. Has completed the requirements of 45.1(10)“a”(1);

2. Has completed on-the-job training as a radiographic trainee supervised by one or more radiographic trainers. The on-the-job training shall be documented on the appropriate agency form or equivalent and shall include a minimum of two months (320 hours) of active participation in the performance of industrial radiography utilizing radioactive material or one month (160 hours) of active participation in the performance of industrial radiography utilizing radiation machines, or both. Individuals performing industrial radiography utilizing radioactive materials and radiation machines must complete both segments of the on-the-job training (three months or 480 hours). Active participation does not include safety meetings or classroom training;

3. Has demonstrated competence in the use of sources of radiation, radiographic exposure devices, related handling tools, and radiation survey instruments which may be employed in industrial radiographic assignments by successful completion of a practical examination covering this material;

(2) Unless the individual has successfully completed within the last five years the appropriate agency-administered examination prescribed in 45.1(10)“f”(2) or equivalent examination; and

(3) Unless the individual possesses a current I.D. card.

c. Radiographer trainer. No individual shall act as a radiographer trainer unless such individual:

(1) Has met the requirements of 45.1(10)“a”(1) and “b”;

(2) Has one year of documented experience as an industrial radiographer and possesses a current ID card issued at least one year prior to the application for a trainer card; and

(3) Is named on the specific license or certificate of registration issued by the agency and under which an individual is acting as a radiographer trainer, or

(4) Possesses a valid radiographer trainer card issued by the agency.

d. Radiation safety officer. The radiation safety officer shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee’s program.

(1) A radiation safety officer (RSO) shall be designated for every industrial radiography license and certificate of registration issued by the agency.

(2) The RSO’s qualifications shall include:

1. Possession of a high school diploma or a certificate of high school equivalency based on the GED test;

2. Completion of the training and testing requirements of 45.1(10)“a”(1) and 45.1(10)“b”(1)“3,” (2), and (3);

3. 2000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and

4. Formal training in the establishment and maintenance of a radiation protection program.

The agency will consider alternatives when the RSO has either appropriate training or experience, or both, in the field of ionizing radiation and, in addition, has adequate formal training with respect to the establishment and maintenance of a radiation safety protection program.

(3) The specific duties of the RSO include, but are not limited to, the following:

1. To establish and oversee operating, emergency, and ALARA procedures and to review them regularly to ensure that the procedures are current and conform with these rules;

2. To oversee and approve all phases of the training program for radiographic personnel so that appropriate and effective radiation protection practices are taught;

3. To ensure that required radiation surveys and leak tests are performed and documented in accordance with these rules, including any corrective measures when levels of radiation exceed established limits;

4. To ensure that personnel monitoring devices are calibrated and used properly by occupationally exposed personnel, that records are kept of the monitoring results, and that timely notifications are made as required by 641—Chapter 40;

5. To ensure that any required interlock switches and warning signals are functioning and that radiation signs, ropes, and barriers are properly posted and positioned;

6. To investigate and report to the agency each known or suspected case of radiation exposure to an individual or radiation level detected in excess of limits established by these rules and each theft or loss of source(s) of radiation, to determine the cause, and to take steps to prevent its recurrence;

7. To have a thorough knowledge of management policies and administrative procedures of the licensee or registrant;

8. To assume control and have the authority to institute corrective actions including shutdown of operations when necessary in emergency situations or unsafe conditions;

9. To maintain records as required by these rules (see Appendix C);

10. To ensure the proper storing, labeling, transport, and use of exposure devices and sources of radiation;

11. To ensure that quarterly inventory and inspection and maintenance programs are performed in accordance with 45.1(6), 45.1(8), 45.2(3), and 45.3(6) “b”;

12. To ensure that personnel are complying with these rules, the conditions of the license or the registration, and the operating and emergency procedures of the licensee or registrant; and

13. To ensure that annual refresher safety training has been provided for each radiographer and radiographer’s assistant at intervals not to exceed 12 months.

e. Training and testing records. Each licensee and registrant shall maintain, for agency inspection, training and testing records which demonstrate that the applicable requirements of 45.1(10) “a” and “b” are met. Records of training for all industrial radiographic personnel must include personnel certification documents and verification of certification status, copies of written tests, dates of oral and practical examinations, and names of individuals conducting and receiving the oral and practical examinations. Records of annual refresher training and semiannual inspection of job performance for all industrial radiographic personnel must list the topics discussed during the refresher safety training, the dates the annual refresher safety training was conducted, and names of the instructors and attendees. For inspections of job performance, the records must also include a list showing the items checked and any noncompliances observed by the RSO. Records shall be maintained until disposal is authorized by the agency. The agency shall not release records for disposal unless the records have been maintained at least three years.

f. Applications and examinations.

(1) Application.

1. An application for taking the examination shall be on forms prescribed and furnished by the agency along with the fee required in 641—subrule 38.8(3). The application shall be submitted only after the training requirements of 45.1(10) “a” and “b” have been completed.

2. An individual whose I.D. card has been suspended or revoked shall obtain prior approval from the agency to apply to take the examination.

(2) Examination. The examination shall be given for the purpose of determining the qualifications of applicants.

1. A written examination shall be held at such times and places as the agency shall determine. The scope of the examination and the methods of procedure, including determination of the passing score, shall be prescribed by the agency. The examination will emphasize the applicant’s ability to safely use sources of radiation and related equipment and the applicant’s knowledge of these rules.

2. A candidate failing an examination may apply for reexamination in accordance with 45.1(10) “f”(1) and will be reexamined. A candidate shall not retake the same version of the agency-administered examination.

3. The examination will be held at locations designated by the agency. The examination shall normally be offered quarterly. Dates, times, and locations of the examinations will be provided by the agency.

4. The examination will be in the English language.

5. To take the examination, an individual shall have a picture identification card (such as an Iowa driver's license) at the time of the examination.

6. Calculators will be permitted during the examination; however, calculators or computers with preprogrammed data or formulas, including exposure calculations, will not be permitted.

7. The examination will be a "closed book" examination.

8. Examination material shall be returned to the agency at the end of the examination. No photographic or other copying of examination questions or materials shall be permitted. Disclosure by any individual of the contents of any examination prior to the administration is prohibited.

9. Any individual observed by an agency proctor to be compromising the integrity of the examination shall be required to surrender the examination, the answer sheet, and any work paper. Such individual will not be allowed to complete the examination, will forfeit the examination fee, and will leave the examination site to avoid disturbing other examinees. Such individual may resubmit an application and an additional examination fee to take the examination not earlier than three months later.

10. The names and scores of individuals taking the examination shall be a public record.

g. Identification procedures.

(1) I.D. card.

1. An I.D. card shall be issued to each person who successfully completes the requirements of 45.1(10) "b" and the examination prescribed in 45.1(10) "f"(2) or an equivalent examination.

2. Each person's I.D. card shall contain the person's photograph.

3. The I.D. card remains the property of the state of Iowa and may be revoked or suspended under the provisions of 45.1(10) "h."

4. Any individual who wishes to replace the I.D. card shall submit to the agency a written request for a replacement I.D. card, stating the reason a replacement I.D. card is needed and the fee required in 641—subrule 38.8(3). The individual shall maintain in possession a copy of the request while performing industrial radiographic operations until a replacement I.D. card is received from the agency.

(2) Expiration of I.D. card. Each I.D. card expires at the end of the day, in the month and year stated on the I.D. card.

(3) Renewal of I.D. card.

1. Applications for examination to renew an I.D. card shall be filed in accordance with 45.1(10) "f"(1).

2. The examination for renewal of an I.D. card shall be administered in accordance with 45.1(10) "f"(2).

3. A renewed I.D. card shall be issued in accordance with 45.1(10) "g"(1).

h. Revocation or suspension of an I.D. card.

(1) Any radiographer who violates these rules may be required to show cause at a formal hearing why the I.D. card should not be revoked or suspended.

(2) When an agency order has been issued for an industrial radiographer to cease and desist from the use of radioactive material or revoking or suspending the I.D. card, the industrial radiographer shall surrender the I.D. card to the agency until such time as the order is changed or the suspension expires.

(3) An agency's inspector may, in certain instances, confiscate any radiographer's I.D. card on the spot while conducting an inspection or investigation. If the inspector determines that the activities being conducted by the radiographer are significant enough to be classified as severity I, II, or III, as specified in 641—38.5(136C), and after obtaining the approval of agency management, the inspector may take any radiographer's I.D. card. The agency will then issue a cease and desist order to the radiographer's employer, forward the I.D. card(s) to the issuing entity, and notify the U.S. Nuclear Regulatory Commission and other agreement states.

i. Exemptions. Any person using a source of radiation to determine the presence of explosives in a package or the authenticity of a piece of art is exempt from the provisions of 45.1(10) "a" to "h."

j. Reciprocity.

(1) Reciprocal recognition by the agency of an individual radiographer certification will be granted provided that:

1. The individual holds a valid certification in the appropriate category and class issued by a certifying entity as defined in 45.1(2).

2. The requirements and procedures of the certifying entity issuing the certification require the same or comparable certification standards as those required by 45.1(10)“a” through “e”; and

3. The individual submits a legible copy of the certification to the agency prior to entry into Iowa.

(2) Enforcement actions with the agency, another agreement state, or the U.S. Nuclear Regulatory Commission or any sanctions by an independent certifying entity may be considered when reviewing a request for reciprocal recognition from a licensee, registrant, or certified radiographer.

(3) Certified radiographers who are granted reciprocity by the agency shall maintain the certification upon which the reciprocal recognition was granted, or prior to the expiration of such certification, shall meet the requirements of 45.1(10)“b.”

45.1(11) Internal audits. Except as provided in 45.1(11)“c,” the RSO or designee shall conduct an inspection program of the job performance of each radiographer and radiographer’s assistant to ensure that these rules, license requirements, and the licensee’s or registrant’s operating and emergency procedures are followed. The inspection program must:

a. Include observation of the performance of each radiographer and radiographer’s assistant during an actual industrial radiographic operation, at intervals not to exceed six months; and

b. Provide that, if a radiographer or radiographer’s assistant has not participated in an industrial radiographic operation for more than six months since the last audit, the radiographer or radiographer’s assistant must demonstrate understanding of the subjects contained in Appendix A of this chapter by a practical examination before the individual can next participate in a radiographic operation.

c. The agency may consider alternatives in those situations where the individual serves as both radiographer and RSO. In those operations where a single individual serves as both radiographer and RSO, and performs all radiography operations, an inspection program is not required.

d. Records of audits shall be maintained by the licensee or registrant for agency inspection for three years from the date of the audit.

45.1(12) Personnel monitoring control.

a. The personnel monitoring program shall meet the applicable requirements of 641—Chapter 40.

b. When performing industrial radiographic operations:

(1) No licensee or registrant shall permit an individual to act as a radiographer, radiographer’s assistant, or radiographer trainer unless at all times during radiographic operations each individual wears, on the trunk of the body, a combination of direct-reading pocket dosimeter, an operating alarm ratemeter, and a film badge, an optically stimulated luminescent device (OSL device) or a thermoluminescent dosimeter (TLD) that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP). For permanent radiographic installations where other appropriate alarming or warning devices are in routine use, the wearing of an alarm ratemeter is not required.

(2) Pocket dosimeters or electronic personal dosimeters shall meet the criteria in ANSI N322-1977 and shall have a range of zero to at least 200 millirems. Electronic personal dosimeters may only be used in place of ion-chamber pocket dosimeters.

(3) Pocket dosimeters or electronic personal dosimeters shall be recharged at the start of each work shift.

(4) Pocket dosimeters or electronic personal dosimeters shall be read and exposures recorded at the beginning and at the end of each work shift, and before each recharging.

(5) If an individual’s pocket dosimeter is discharged beyond its range (i.e., goes “off scale”), or if the electronic personal dosimeter reads greater than 200 millirem (2 millisievert), and the possibility of radiation exposure cannot be ruled out as the cause, industrial radiographic operations by that individual shall cease and the individual’s film badge, OSL device, or TLD shall be within 24 hours sent for processing. The individual shall not return to work with sources of radiation until a determination of the

radiation exposure has been made. This determination must be made by the RSO or the RSO's designee. The results of this determination must be included in the exposure records maintained in accordance with 641—Chapter 40.

(6) Each individual monitoring device shall be assigned to and worn by only one individual.

(7) Film badges, OSL devices and TLDs must be replaced at least monthly.

(8) If an individual monitoring device is lost or damaged, the worker shall cease work immediately until a replacement individual monitoring device is provided and the exposure is calculated for the time period from issuance to loss or damage of the individual monitoring device. The results of the calculated exposure and the time period for which the individual monitoring device was lost or damaged must be included in the records maintained in 45.1(12)“c.”

c. Records of pocket dosimeter readings of personnel exposures and yearly operability checks required in 45.1(12)“d” shall be maintained for three years by the licensee or registrant for agency inspection. If the dosimeter readings were used to determine external radiation dose (i.e., no TLD or film badge exposure records exist), the records shall be maintained for three years after they are recorded. Records of estimates of exposures as a result of off-scale personal direct reading dosimeters, or lost or damaged film badges, OSLs, or TLDs, shall be maintained until the agency terminates the license.

d. Pocket dosimeters shall be checked for correct response to radiation at periods not to exceed one year. Acceptable dosimeters shall read within plus or minus 20 percent of the true radiation exposure. Records of this check shall be maintained for inspection by the agency for three years from the date of the event.

e. Reports received from the film badge, OSL device or TLD processor shall be kept for inspection by the agency until the agency terminates the license.

f. Each alarm ratemeter must:

(1) Be checked to ensure that the alarm functions properly (sounds) prior to use at the start of each shift. Records of alarm function checks shall be maintained for two years by the licensee or registrant for agency inspection;

(2) Be set to give an alarm signal at a preset dose rate of 500 mR/hr;

(3) Require special means to change the preset alarm function; and

(4) Be calibrated at periods not to exceed one year for correct response to radiation: Acceptable ratemeters must alarm within plus or minus 20 percent of the true radiation dose rate. Records of the alarming ratemeter calibrations shall be maintained for three years by the licensee or registrant for agency inspection.

45.1(13) Supervision of radiographer's assistant. Whenever a radiographer's assistant uses radiographic exposure devices, sealed sources or associated equipment or conducts radiation surveys required by 45.2(5) or 45.3(7) to determine that the sealed source has returned to the shielded position after an exposure, the radiographer's assistant shall be under the direct supervision of a radiographer instructor. The direct supervision must include:

a. The radiographer's physical presence at the site where the source(s) of radiation is being used;

b. The availability of the radiographer to give immediate assistance if required; and

c. The radiographer's direct observation of the radiographer's assistant's performance of the operations referred to in this subrule.

45.1(14) Access control.

a. During each industrial radiographic operation, a radiographer or radiographer's assistant shall maintain continuous, direct visual surveillance of the operation to protect against unauthorized entry into a restricted area, radiation area or high radiation area, except at permanent radiographic installations where all entryways are locked to protect against unauthorized or accidental entry and the requirements of 45.1(9) are met.

b. Radiographic exposure devices shall not be left unattended except when in storage or physically secured against unauthorized removal.

45.1(15) Posting.

a. Notwithstanding any provisions in 641—subrule 40.62(1) areas in which radiography is being performed shall be conspicuously posted as required by 641—subrules 40.61(1) and 40.61(2).

b. Whenever practicable, ropes or barriers shall be used in addition to appropriate signs to designate areas in accordance with 641—subrule 40.26(1) and to help prevent unauthorized entry.

c. During pipeline industrial radiography operations, sufficient radiation signs and other barriers shall be posted to prevent unmonitored individuals from entering the radiation area.

d. Notwithstanding the requirements of 45.1(15)“a,” a restricted area may be established in accordance with 641—subrule 40.26(1) and may be posted in accordance with 40.61(1) and 40.61(2), i.e., both signs may be posted at the same location at the boundary of the restricted area.

45.1(16) Temporary job site requirements.

a. Documents and records. Each licensee or registrant conducting industrial radiography at a temporary job site shall have the following records available at that site for inspection by the agency:

- (1) Appropriate license or certificate of registration or equivalent document;
- (2) The appropriate operating and emergency procedures;
- (3) The applicable agency rules;
- (4) Survey records required pursuant to 45.2(5) “d” and 45.3(7) “j” for the period of operation at the site;
- (5) Daily pocket dosimeter records for the period of operation at the site;
- (6) The daily alarming ratemeter records for the period of operation at the site; and
- (7) The latest radiation survey instrument calibration and leak test records for specific devices and sealed sources in use at the site. Acceptable records include tags or labels which are affixed to the device or survey meter and decay charts for sources which have been manufactured within the last six months.

b. Reserved.

45.1(17) Specific requirements for radiographic personnel performing industrial radiography.

a. At a job site, the following shall be supplied by the licensee or registrant:

- (1) At least one operable, calibrated radiation survey instrument;
- (2) A current whole body personnel monitor (TLD, OSL device or film badge) for each individual;
- (3) An operable, calibrated pocket dosimeter with a range of 0 to 200 milliroentgens (5.16×10^{-5} C/kg) for each worker; and
- (4) An operable, calibrated alarm ratemeter for each worker; and
- (5) The appropriate barrier ropes and signs.

b. Each radiographer at a job site shall possess a valid I.D. card.

c. Each radiographer’s assistant at a job site shall possess a valid trainee status card issued by the agency.

d. Industrial radiographic operations shall not be performed if any of the items in 45.1(17)“a,” “b,” and “c” are not available at the job site or are inoperable.

e. No individual other than a radiographer or a radiographer’s assistant who is under the direct supervision of a radiographer trainer shall manipulate controls or operate equipment used in industrial radiographic operations.

f. During an inspection by the agency, the agency inspector may terminate an operation if any of the items in 45.1(17)“a” are not available and operable or if the required number of radiographic personnel are not present. Operations shall not be resumed until such conditions are met.

45.1(18) Notification of incidents.

a. The agency shall be notified of thefts or losses of sources of radiation, overexposures, and excessive levels in accordance with 641—40.95(136C) and 40.97(136C).

b. Each licensee or registrant shall submit a written report within 30 days to the agency whenever one of the following events occurs:

- (1) The source assembly cannot be returned to the fully shielded position and properly secured;
- (2) The source assembly becomes disconnected from the drive cable;
- (3) The failure of any component (critical to safe operation of the radiographic exposure device) to properly perform its intended function; or
- (4) An indicator on a radiation-producing machine fails to show that radiation is being produced or an exposure switch fails to terminate production of radiation when turned to the off position.

c. The licensee or registrant shall include the following information in each report submitted in accordance with 45.1(18)“b”:

- (1) A description of the equipment problem;
- (2) Cause of each incident, if known;
- (3) Manufacturer and model number of equipment involved in the incident;
- (4) Location, time, and date of the incident;
- (5) Actions taken to establish normal operations;
- (6) Corrective actions taken or planned to prevent recurrence; and
- (7) Names of personnel involved in the incident.

45.1(19) Copies of operating and emergency procedures. Each licensee or registrant shall maintain a copy of current operating and emergency procedures until the agency terminates the license. Superseded material must be retained for three years after the change is made.

[ARC 8982B, IAB 8/11/10, effective 9/15/10; ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—45.2(136C) Radiation safety requirements for the use of radiation machines in industrial radiography.

45.2(1) Locking of sources of radiation. The control panel of each radiation machine shall be equipped with a locking device that will prevent the unauthorized use of an X-ray system or the accidental production of radiation. The radiation machine shall be kept locked and the key removed at all times except when under the direct visual surveillance of a radiographer.

45.2(2) Permanent storage precautions. Radiation machines shall be secured while in storage to prevent tampering or removal by unauthorized individuals.

45.2(3) Requirements for radiation machines used in industrial radiographic operations.

a. Equipment used in industrial radiographic operations involving radiation machines manufactured after January 1, 1992, shall be certified at the time of manufacture to meet the criteria set forth by ANSI N537-1976.

b. The registrant’s name and city or town where the main business office is located shall be prominently displayed with a durable, clearly visible label(s) on all vehicles used to transport radiation machines for temporary job site use.

45.2(4) Operating and emergency procedures.

a. The registrant’s operating and emergency procedures shall include instructions in at least the following:

- (1) Operation and safety instruction on the radiation machine(s) to be used;
- (2) Methods and occasions for conducting radiation surveys;
- (3) Methods for controlling access to radiographic areas;
- (4) Methods and occasions for locking and securing sources of radiation;
- (5) Personnel monitoring and the use of personnel monitoring equipment, including steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale;
- (6) Minimizing exposure of individuals in the event of an accident;
- (7) The procedure for notifying proper personnel in the event of an accident;
- (8) Maintenance of records; and
- (9) Inspection and maintenance of radiation machines.

b. Each registrant shall provide, as a minimum, two radiographic personnel when radiation machines are used for any industrial radiography conducted other than at a permanent radiographic installation (shielded room, bay, or bunker). If one of the personnel is a radiographer’s assistant, the other shall be a radiographer trainer authorized by the certificate of registration.

c. No individual other than a radiographer or a radiographer’s assistant who is under the direct supervision of a radiographer trainer shall manipulate controls or operate equipment used in industrial radiographic operations.

d. Rescinded IAB 4/8/98, effective 7/1/98.

45.2(5) Radiation surveys and survey records.

a. No radiographic operation shall be conducted unless calibrated and operable radiation survey instrumentation, as described in 45.1(5), is available and used at each site where radiographic exposures are made.

b. A physical radiation survey shall be made after each radiographic exposure using radiation machines to determine that the machine is “off.”

c. All potential radiation areas where industrial radiographic operations are to be performed shall be posted in accordance with 45.1(15), based on calculated dose rates, before industrial radiographic operations begin. An area survey shall be performed during the first radiographic exposure to confirm that 45.1(15) requirements have been met and that unrestricted areas do not have radiation levels in excess of the limits specified in 641—subrule 40.26(1).

d. Records shall be kept of the surveys required by 45.2(5) “b” and “c.” Such records shall be maintained for inspection by the agency for two years after completion of the survey. If the survey was used to determine an individual’s exposure, however, the records of the survey shall be maintained until the agency authorizes their disposition.

45.2(6) *Special requirements and exemptions for enclosed radiography.*

a. Systems for enclosed radiography, including shielded-room radiography and cabinet radiography, designed to allow admittance of individuals shall:

(1) Comply with all applicable requirements of this chapter and 641—subrule 40.26(1). If such a system is a certified cabinet X-ray system, it shall comply with all applicable requirements of this chapter and 21 CFR 1020.40.

(2) Be evaluated at intervals not to exceed one year to ensure compliance with the applicable requirements as specified in 641—subrule 40.26(1). Records of these evaluations shall be maintained for inspection by the agency for a period of three years after the evaluation.

b. Certified and certifiable cabinet X-ray systems are exempt from the requirements of this chapter except that:

(1) Operating personnel must be provided with individual monitoring devices in accordance with the appropriate provisions of 641—40.37(136C).

(2) No registrant shall permit any individual to operate a cabinet X-ray system until such individual has received a copy of and instruction in the operating procedures for the unit and has demonstrated competence in its use. Records which demonstrate compliance with this subparagraph shall be maintained for inspection by the agency until disposition is authorized by the agency.

(3) Tests for proper operation of interlocks used to control entry to the high radiation area or alarm systems, where applicable, shall be conducted and recorded every three months. Records of these tests shall be maintained for agency inspection until disposal is authorized by the agency.

(4) The registrant shall perform an evaluation, at intervals not to exceed one year, to determine conformance with 641—subrule 40.26(1). If such a system is a certified cabinet X-ray system, it shall be evaluated at intervals not to exceed one year to determine conformance with 21 CFR 1020.40. Records of these evaluations shall be maintained for inspection by the agency for a period of two years after the evaluation.

c. Certified cabinet X-ray systems shall be maintained in compliance with 21 CFR 1020.40 unless prior approval has been granted by the agency pursuant to 641—38.3(136C).

45.2(7) *Registration for industrial radiographic operations.*

a. Radiation machines used in industrial radiographic operations shall be registered in accordance with 641—Chapter 39.

b. In addition to the registration requirements in 641—Chapter 39, an application for a certificate of registration shall include the following information:

- (1) A schedule or description of the program for training radiographic personnel which specifies:
 1. Initial training,
 2. Periodic training,
 3. On-the-job training, and

4. Methods to be used by the registrant to determine the knowledge, understanding, and ability of radiographic personnel to comply with agency rules, registration requirements, and the operating and emergency procedures of the applicant.

(2) Written operating and emergency procedures, including all items listed in Appendix D.

(3) A description of the internal inspection system or other management control to ensure that radiographic personnel follow registration provisions, rules of the agency, and the applicant's operating and emergency procedures.

(4) A list of permanent radiographic installations and descriptions of permanent storage and use locations.

(5) A description of the organization of the industrial radiographic program, including delegations of authority and responsibility for operation of the radiation safety program.

c. A certificate of registration will be issued if the requirements of 641—Chapter 39 and this subrule are met.

641—45.3(136C) Radiation safety requirements for use of sealed sources of radiation in industrial radiography.

45.3(1) *Limits on external radiation levels from storage containers and source changers.* The maximum exposure rate limits for storage containers and source changers are 200 millirem (2 millisieverts) per hour at any exterior surface, and 10 millirem (0.1 millisievert) per hour at 1 meter from any exterior surface with the sealed source in the shielded position.

45.3(2) *Locking of sources of radiation.*

a. Each source of radiation shall be provided with a lock or lockable outer container designed to prevent unauthorized or accidental removal of the sealed source. Either the exposure device or its container must be kept locked and, if applicable, the key removed, at all times when not under the direct surveillance of a radiographer or a radiographer's assistant except at permanent radiographic installations as stated in 45.1(14). Each sealed source storage container and source changer must have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. Storage containers and source changers must be kept locked (and if the lock is a keyed lock, with the key removed at all times) when containing sealed sources except when the container is under the direct surveillance of a radiographer or radiographer's assistant.

b. Radiographic exposure devices, source changers, and storage containers, prior to being moved from one location to another and also prior to being secured at a given location, shall be locked and surveyed to ensure that the sealed source is in the shielded position.

c. The sealed source shall be secured in its shielded position by locking the exposure device or securing the remote control each time the sealed source is returned to its shielded position. Then a survey shall be performed to determine that the sealed source is in the shielded position pursuant to 45.3(7) "b."

45.3(3) *Storage precautions.*

a. Labeling, storage, and transportation.

(1) The licensee may not use a source changer or a container to store licensed material unless the source changer or the storage container has securely attached to it a durable, legible, and clearly visible label bearing the standard trefoil radiation caution symbol in conventional colors, i.e., magenta, purple or black on a yellow background, having a minimum diameter of 25 mm, and the wording: "CAUTION RADIOACTIVE MATERIAL, NOTIFY CIVIL AUTHORITIES (or name of company)" or "DANGER RADIOACTIVE MATERIAL, NOTIFY CIVIL AUTHORITIES (or name of company)."

(2) The licensee may not transport licensed material unless the material is packaged, and the package is labeled, marked, and accompanied with appropriate shipping papers in accordance with 641—39.5(136C).

(3) Locked radiographic exposure devices and storage containers must be physically secured to prevent tampering or removal by unauthorized personnel. The licensee shall store licensed material in a manner which will minimize danger from explosion or fire.

(4) The licensee shall lock and physically secure the transport package containing licensed material in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal of the licensed material from the vehicle.

b. Radiographic exposure devices, source changers, or storage containers that contain radioactive material shall not be stored in residential locations. This requirement does not apply to storage of radioactive material in a vehicle in transit for use at temporary job sites, if the licensee complies with 45.3(3) “*c.*,” and if the vehicle does not constitute a permanent storage location as described in 45.1(9).

c. If a vehicle is to be used for storage of radioactive material, a vehicle survey shall be performed after securing radioactive material in the vehicle and before transport to ensure that radiation levels do not exceed the limits specified in 641—subrule 40.26(1) at the exterior surface of the vehicle.

d. A storage or use location is permanent if radioactive material is stored at the location for more than 90 days and any one or more of the following applies to the location:

- (1) Telephone service is established by the licensee;
- (2) Industrial radiographic services are advertised for or from the location;
- (3) Industrial radiographic operations are conducted at other sites due to arrangements made from the location.

45.3(4) *Performance requirements for radiography equipment.* Equipment used in industrial radiographic operations must meet the following minimum criteria:

a. Each radiographic exposure device, source assembly or sealed source, and all associated equipment must meet the requirements specified in American National Standard N432-1980, “Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography” (published as NBS Handbook 136, issued January 1981). This publication has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. This publication may be purchased from the American National Standards Institute, Inc., 25 West 43rd Street, New York, New York 10036, telephone (212)642-4900.

b. In addition to the requirements specified in paragraph “*a.*” of this subrule, the following requirements apply to radiographic exposure devices, source changers, source assemblies, sealed sources, and associated equipment.

(1) Each radiographic exposure device must have attached to it by the user a durable, legible, clearly visible label bearing the:

1. Chemical symbol and mass number of the radionuclide in the device;
2. Activity and the date on which this activity was last measured;
3. Model number (or product code) and serial number of the sealed source;
4. Manufacturer’s identity of the sealed source; and
5. Licensee’s name, address, and telephone number.

(2) Radiographic exposure devices intended for use as Type B transport containers must meet the applicable requirements of 641—39.5(136C).

(3) Modification of any radiographic exposure devices, source changers, and source assemblies and associated equipment is prohibited, unless the design of any replacement component, including source holder, source assembly, controls or guide tubes would not compromise the design safety features of the system.

c. In addition to the requirements specified in paragraphs “*a.*” and “*b.*” of this subrule, the following requirements apply to radiographic exposure devices, source assemblies, and associated equipment that allow the source to be moved out of the device for radiographic operation or source changing:

(1) The coupling between the source assembly and the control cable must be designed in such a manner that the source assembly will not become disconnected if cranked outside the guide tube. The coupling must be such that it cannot be unintentionally disconnected under normal and reasonably foreseeable abnormal conditions;

(2) The device must automatically secure the source assembly when it is cranked back into the fully shielded position within the device. This securing system may only be released by means of a deliberate operation on the exposure device;

(3) The outlet fittings, lock box, and drive cable fittings on each radiographic exposure device must be equipped with safety plugs or covers which must be installed during storage and transportation to protect the source assembly from water, mud, sand, or other foreign matter;

(4) Each sealed source or source assembly must have attached to it or engraved in it, a durable, legible, visible label with the words: "DANGER—RADIOACTIVE." The label must not interfere with safe operation of the exposure device or associated equipment;

(5) The guide tube must be able to withstand a crushing test that closely approximates the crushing forces that are likely to be encountered during use, and be able to withstand a kinking resistance test that closely approximates the kinking forces that are likely to be encountered during use;

(6) Guide tubes must be used when moving the source out of the device;

(7) An exposure head or similar device designed to prevent the source assembly from passing out of the end of the guide tube must be attached to the outermost end of the guide tube during radiographic operations;

(8) The guide tube exposure head connection must be able to withstand the tensile test for control units specified in ANSI N432-1980;

(9) Source changers must provide a system for ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.

d. All newly manufactured radiographic exposure devices and associated equipment acquired by licensees after January 10, 1992, must comply with the requirements of this subrule.

e. All radiographic exposure devices and associated equipment in use after January 10, 1996, must comply with the requirements of this subrule.

f. Notwithstanding the requirements of 45.3(4) "a," equipment used in industrial radiographic operations need not comply with § 8.9.2(c) of the Endurance Test in American National Standards Institute N432-1980, if the prototype equipment has been tested using a torque value representative of the torque that an individual using the radiography equipment can realistically exert on the lever or crankshaft of the drive mechanism.

g. Engineering analysis may be submitted by an applicant or licensee to demonstrate the applicability of previously performed testing on similar individual radiography equipment components. Upon review, the agency may find this an acceptable alternative to actual testing of the component pursuant to the above-referenced standard.

45.3(5) *Leak testing, repair, tagging, opening, modification, and replacement of sealed sources.*

a. The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening, or any other modification of any sealed source shall be performed only by persons specifically authorized to do so by the agency, the U.S. Nuclear Regulatory Commission, or an agreement state.

b. Leak testing requirements.

(1) Each licensee that uses a sealed source shall have the source tested for leakage at intervals not to exceed 6 months. The leak testing of the source must be performed using a method approved by this agency. The wipe sample should be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample must be analyzed for radioactive contamination. The analysis must be capable of detecting the presence of 0.005 microcuries (185 Bq) of radioactive material on the test sample and must be performed by a person specifically authorized by this agency to perform the analysis.

(2) The licensee shall maintain records of the leak tests results for sealed sources and devices containing depleted uranium (DU). The results must be stated in units of microcuries (becquerels). The licensee shall retain each record for three years after it is made or until the source in storage is removed.

(3) Unless a sealed source is accompanied by a certificate from the transferor that shows that it has been leak tested within 6 months before the transfer, it may not be used by the licensee until tested for leakage. Sealed sources that are in storage and not in use do not require leak testing, but must be tested before use or transfer to another person if the interval of storage exceeds 6 months.

c. Any test conducted under this subrule which reveals the presence of 0.005 microcuries (185 Bq) or more of removable radioactive material must be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw from use the equipment involved and shall have it decontaminated and repaired or disposed of in accordance with agency rules. Within five days after obtaining the results of the test, the licensee shall file a report with the agency describing the equipment involved, the test results, and the corrective action taken.

d. Each exposure device using DU shielding and an “S” tube configuration must be tested for DU contamination at intervals not to exceed 12 months. The analysis must be capable of detecting the presence of 0.005 microcuries (185 Bq) of radioactive material on the test sample and must be performed by a person specifically authorized by the agency to perform the analysis. Should such testing reveal the presence of 0.005 microcuries (185 Bq) or more of removable DU contamination, the exposure device must be removed from use until an evaluation of the wear on the S-tube has been made. Should the evaluation reveal that the S-tube is worn through, the device may not be used again. DU-shielded devices do not have to be tested for DU contamination while in storage and not in use. Before using or transferring such a device, however, the device must be tested for DU contamination if the interval of storage exceeds 12 months.

e. Each radiographic exposure device shall have permanently attached to it a durable label which has, as a minimum, the instruction: “Danger—Radioactive Material—Do Not Handle—Notify Civil Authorities if Found.”

45.3(6) *Operating and emergency procedures.*

a. The licensee’s operating and emergency procedures shall include instructions in at least the following:

- (1) Handling and use of sources of radiation to be employed such that no individual is likely to be exposed to radiation doses in excess of the limits established in 641—Chapter 40;
 - (2) Methods and occasions for conducting radiation surveys;
 - (3) Methods for controlling access to radiographic areas;
 - (4) Methods and occasions for locking and securing sources of radiation;
 - (5) Personnel monitoring and the use of personnel monitoring equipment, including steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale;
 - (6) Transportation to field locations, including packing of sources of radiation in the vehicles, posting of vehicles, and control of sources of radiation during transportation;
 - (7) Minimizing exposure of individuals in the event of an accident;
 - (8) The procedure for notifying proper personnel in the event of an accident;
 - (9) Maintenance of records;
 - (10) The inspection, maintenance, and operability checks of radiographic exposure devices, survey instruments, source changers, storage containers, and radiation machines;
 - (11) The procedure(s) for identifying and reporting defects and noncompliance in 10 CFR Part 21;
- and

(12) Source recovery procedure if the licensee will perform source recovery.

b. Rescinded IAB 4/8/98, effective 7/1/98.

c. Whenever radiography is performed at a location other than a permanent radiographic installation, the radiographer must be accompanied by at least one other qualified radiographer or a radiographer’s assistant. If one of the personnel is a radiographer’s assistant, the other shall be a radiographer trainer authorized by the license. The additional qualified individual shall observe the operations and be capable of providing immediate assistance to prevent unauthorized entry. Radiography shall not be performed if only one qualified individual is present.

d. Collimators shall be used in industrial radiographic operations which use crank-out devices except when physically impossible.

e. All radiographic operations conducted at locations of use authorized on the license must be conducted in a permanent radiographic installation, unless specifically authorized by the agency.

45.3(7) *Radiation surveys and survey records.*

a. No radiographic operation shall be conducted unless calibrated and operable radiation survey instrumentation, as described in 45.1(5), is available and for each exposure device used at each site where radiographic exposures are made.

b. A survey with a calibrated and operable radiation survey instrument shall be made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device shall be surveyed. If the radiographic exposure device has a source guide tube, the survey shall also include the entire length of the guide tube and collimator. The survey required by this subrule must be done before exchanging films, repositioning the exposure head or dismantling the equipment.

c. (1) All potential radiation areas where industrial radiographic operations are to be performed shall be posted in accordance with 641—40.61(136C), based on calculated dose rates, before industrial radiographic operations begin. An area survey shall be performed during the first radiographic exposure (i.e., with the sealed source in the exposed position) to confirm that 641—40.61(136C) requirements have been met and that unrestricted areas do not have radiation levels in excess of the limits specified in 641—subrule 40.26(1).

(2) Each time the exposure device is relocated or the exposed position of the sealed source is changed, the requirements of 45.3(7)“c”(1) shall be met.

d. A lock-out survey, in which all accessible surfaces of the radiographic exposure device or source changer are surveyed, shall be made to determine that each sealed source is in its shielded position before securing the radiographic exposure device or source changer.

e. The sealed source shall be secured in its shielded position by locking the radiographic exposure device or source changer each time the sealed source is returned to its shielded position.

f. Each radiographic exposure device and source changer shall be locked and the key removed from any keyed lock prior to being moved or transported from one location to another and also prior to being stored at a given location.

g. If a vehicle is to be used for storage of radioactive material, a vehicle survey shall be performed after securing radioactive material in the vehicle and before transport to ensure that radiation levels do not exceed the limits specified in 641—subrule 40.26(1) at the exterior surface of the vehicle.

h. Surveys shall be performed on storage containers to ensure that radiation levels do not exceed the limits specified in 641—40.15(136C). These surveys shall be performed initially with the maximum amount of radioactive material present in the storage location and thereafter at the time of the quarterly inventory and whenever storage conditions change.

i. A survey meeting the requirements of 45.3(7)“b” shall be performed on the radiographic exposure device and the source changer after every sealed source exchange. A survey shall be made of the storage area as defined in 641—45.2(136C) whenever a radiographic exposure device is being placed in storage.

j. Records shall be kept of the surveys required by 45.3(7)“c,” “d,” “g,” “h,” and “i.” Such records shall be maintained for inspection by the agency for two years after completion of the survey. If the survey was used to determine an individual’s exposure, however, the records of the survey shall be maintained until the agency authorizes their disposition.

45.3(8) Requirements for enclosed radiography.

a. Systems for enclosed radiography, including shielded-room radiography designed to allow admittance of individuals shall comply with all applicable requirements of this chapter.

b. Procedures shall be evaluated at intervals not to exceed one year to ensure compliance with the applicable requirements as specified in 641—subrule 40.26(1). Records of these evaluations shall be maintained for inspection by the agency for a period of two years after the evaluation.

c. Tests for proper operation of high radiation area control devices or alarm systems, where applicable, shall be conducted, recorded, and maintained in accordance with 45.1(9)“b.”

45.3(9) Underwater, offshore platform, and lay-barge radiography.

a. Underwater, offshore platform, or lay-barge radiography shall not be performed unless specifically authorized in a license issued by the agency in accordance with 641—paragraph 39.4(27)“e.”

b. In addition to the other rules of this chapter, the following rules apply to the performance of lay-barge or offshore platform radiography:

(1) Cobalt-60 sources with activities in excess of 20 curies (nominal) and iridium-192 sources with activities in excess of 100 curies (nominal) shall not be used in the performance of lay-barge or offshore platform industrial radiography.

(2) Collimators shall be used for all industrial radiographic operations performed on lay-barge or offshore platforms.

45.3(10) Prohibitions. Industrial radiography performed with a sealed source which is not fastened to or contained in a radiographic exposure device (fishpole technique) is prohibited unless specifically authorized in a license issued by the agency.

45.3(11) Licensing for industrial radiographic operations. Rescinded IAB 4/5/00, effective 5/10/00. [ARC 1639C, IAB 10/1/14, effective 11/5/14; ARC 3746C, IAB 4/11/18, effective 5/16/18]

641—45.4(136C) Radiation safety requirements for the use of particle accelerators for nonhuman use.

45.4(1) Purpose and scope.

a. This rule establishes procedures for the registration or licensing and the use of particle accelerators.

b. Unless specifically required otherwise by this rule, all registrants or licensees performing operations with a particle accelerator are subject to the requirements of 641—Chapters 38 to 40 and 641—45.1(136C).

c. The requirements of 45.1(10)“b”(2) and (3) and 45.1(10)“d”(1)“2” do not apply to nonradiographic uses.

45.4(2) Definitions. For purposes of this subrule, definitions in 641—Chapters 38 and 40 and subrule 45.1(2) may also apply. As used in this rule, the following definitions apply:

“Cold pasteurization” means the process of using radiation for destroying disease-causing microorganisms in commercial products.

“Self-shielded particle accelerator” means a particle accelerator with the accelerator installed in an enclosure independent of the existing architectural structures except the floor on which it may be placed. The enclosure must have been evaluated by a qualified expert and that evaluation approved by an appropriate regulatory authority through a device evaluation. The self-shielded accelerator is intended to contain at least that portion of material being irradiated, provide radiation attenuation, and exclude personnel from its interior during generation of radiation. A particle accelerator used within a shielded part of a building, or which may temporarily or occasionally incorporate portable shielding, is not a self-shielded particle accelerator.

“Shielded facility” means an accelerator facility where shielding is required to be constructed on site in order to assure compliance with the requirements of 641—Chapter 40, or where shielding supplied with the accelerator has been evaluated by qualified experts and that evaluation approved by an appropriate regulatory authority through a device evaluation.

45.4(3) Registration or license requirements. No person shall receive, possess, use, transfer, own, or acquire a particle accelerator except as authorized in a registration or license issued pursuant to 641—39.1(136C) to 39.4(136C) and the following requirements:

a. Accelerator facilities whose operations result in nuclear transformations that produce or are likely to produce radioactive material more than the exempt quantities and concentrations listed in Appendices A and B of 641—Chapter 39 shall be authorized by the issuance of a radioactive material license in accordance with 641—Chapter 39. Accelerator facilities that produce or are likely to produce radioactive material less than the exempt quantities and concentrations shall be authorized by registration.

b. For accelerator facilities required to be licensed in accordance with 45.4(3), those operations that would require personnel monitoring, pursuant to 641—40.37(136C), due to the presence of radioactive material, shall be performed only by a specific licensee. Such operations would normally include installation, testing and maintenance as well as routine operations.

45.4(4) General requirements for the issuance of a registration or license for particle accelerators. Along with the requirements of 641—39.1(136C) to 39.4(136C), an application for use of a particle accelerator will be approved only if the agency determines that:

- a. The applicant is qualified by reason of training and experience to use the accelerator in question for the purpose requested in accordance with this rule and 641—Chapter 40 in such a manner as to minimize danger to public health and safety or property;
- b. The applicant's proposed or existing equipment, facilities, and operating and emergency procedures are adequate to protect health and minimize danger to public health and safety or property;
- c. The issuance of the registration or license will not be inimical to the health and safety of the public, and the applicant satisfies any applicable special requirement in 45.4(4);
- d. The applicant has appointed a radiation safety officer responsible for the day-to-day operation of the radiation safety program;
- e. The applicant and the applicant's staff have experience in the use of particle accelerators and training sufficient for application to its intended uses;
- f. The applicant has an adequate training program for operators of particle accelerators.

45.4(5) Personnel monitoring. In addition to the requirements of 641—Chapter 40, personnel monitoring shall be provided to and used by all individuals entering any area for which interlocks are required unless a survey of the area has determined that radiation levels are below that of a high radiation area; and

- a. Power to an accelerator cannot be activated; or
- b. An accelerated beam cannot be directed to the area.

45.4(6) Operations.

a. No registrant shall permit any individual to act as an operator of a particle accelerator until such individual:

- (1) Has been instructed in radiation safety and shall have demonstrated an understanding thereof;
- (2) Has received copies of and instruction in this rule and the applicable requirements of 641—Chapter 40, pertinent registration and the registrant's operating and emergency procedures, and shall have demonstrated understanding thereof; and
- (3) Has demonstrated competence to use the particle accelerator, related equipment, and survey instruments which will be employed.

b. The radiation safety officer or radiation safety committee, if applicable, shall have the authority to terminate the operations at a particle accelerator facility if such action is deemed necessary to minimize danger to public health and safety or property.

c. Along with the audit required in 641—subrule 40.10(3), each operator's performance during an actual accelerator operation shall be audited by the radiation safety officer or designee at intervals not to exceed six months. If an operator has not participated in an accelerator operation for more than six months since the last audit, the individual's performance shall be observed and recorded at the first opportunity the individual participates in an accelerator operation. Records of the audits shall be maintained by the registrant for the agency inspection for three years from the date of the audit.

d. Operators of particle accelerators used for industrial radiography shall meet the requirements of 45.1(10).

45.4(7) Shielding and safety design requirements.

a. A qualified expert acceptable to the agency shall be consulted in the design of a particle accelerator installation and called upon to perform a radiation survey when the accelerator is first capable of producing radiation.

b. Each particle accelerator installation shall be provided with such primary and secondary barriers as are necessary to ensure compliance with 641—40.15(136C) and 641—40.26(136C).

c. In addition to the requirements of 45.4(8) "a" and "b," shielded facilities or self-shielded particle accelerators shall meet the following requirements:

- (1) Authorization, by issuance of a construction permit, shall be granted upon a determination of adequacy being made pursuant to the review of an initial application of the shielding design, physical plant, and site specifications, and of the applicant's proposed equipment, uses and workloads. For a

shielded facility, the applicant shall submit an evaluation of the shielding design by a qualified expert. For a self-shielded particle accelerator, the applicant need not submit an evaluation of a shielding design if an evaluation by an appropriate regulatory authority has been performed. The applicant may instead reference this evaluation. The applicant shall maintain a copy of the evaluation of shielding design for agency review.

(2) Authorization for installation and testing of an accelerator shall be given only after a determination of adequacy of testing protocols, testing safety procedures, staff training, and radiation detection instrumentation has been made; and

(3) Operational use of an accelerator shall be authorized only after determination of adequacy of the items listed in 45.4(4) has been made by the agency.

45.4(8) Particle accelerator controls and interlock systems.

a. Instrumentation, readouts, and controls on the particle accelerator control console shall be clearly identified, easily discernible and located outside the high radiation area.

b. Each entrance into a target area or other high radiation area shall be provided with two safety interlocks that shut down the machine when the barrier is breached.

c. Each safety interlock shall be on a circuit that allows it to operate independently of all other safety interlocks.

d. All safety interlocks shall be designed so that any defect or component failure in the safety interlock system prevents operation of the accelerator.

e. When a safety interlock system has been tripped, it shall only be possible to resume operation of the accelerator by manually resetting controls at the position where the safety interlock has been tripped and, lastly, at the main control console.

f. A scram button or other emergency power cutoff switch shall be located and easily identifiable in all high radiation areas. Such a cutoff switch shall include a manual reset so that the accelerator cannot be restarted from the accelerator control console without resetting the cutoff switch.

45.4(9) Warning devices.

a. Each location designated as a high radiation area, and each entrance to such location, shall be equipped with easily observable warning lights that operate when, and only when, radiation is being produced.

b. Each high radiation area shall have an audible warning device that shall be activated for 15 seconds prior to the possible creation of such high radiation area. Such warning device shall be clearly discernible in all high radiation areas.

c. Barriers, temporary or otherwise, and pathways leading to high radiation areas shall be posted in accordance with 641—40.61(136C).

45.4(10) Operating and emergency procedures.

a. Particle accelerators, when not in operation, shall be secured to prevent unauthorized use.

b. The safety interlock system shall not be used to turn off the accelerator beam except in an emergency.

c. All safety and warning devices, including interlocks, shall be checked for proper operation intervals not to exceed three months. Results of such tests shall be maintained at the accelerator facility for inspection by the agency for three years.

d. All incidents in which the interlock system fails to operate properly or where the operation is terminated by the interlock system shall be investigated and reported to the radiation safety officer or, if applicable, the radiation safety committee. Documentation shall be maintained for inspection by the agency for three years.

e. If, for any reason, it is necessary to intentionally bypass a safety interlock or interlocks, such action shall be:

- (1) Authorized by the radiation safety officer and, if applicable, the radiation safety committee;
- (2) Recorded in a permanent log and a notice posted at the accelerator control console; and
- (3) Terminated as soon as possible.

f. The registrant's operating and emergency procedures shall include the following:

- (1) Operation and safety instructions on the accelerator(s) to be used;

- (2) Methods for controlling access to restricted areas;
- (3) Methods and occasions for locking and securing sources of radiation;
- (4) Use of personnel monitoring equipment;
- (5) The procedure for notifying proper personnel in the event of an accident;
- (6) Maintenance of records;
- (7) Inspections and maintenance of the accelerator; and
- (8) Steps to be taken in the case of an emergency.

g. A copy of the current operating and emergency procedures shall be maintained at the accelerator control panel.

45.4(11) Radiation monitoring requirements.

a. A radiation protection survey shall be performed and documented by a qualified expert, acceptable to the agency, when changes have been made in shielding, operation, equipment, or occupancy of adjacent areas.

b. Accelerator facilities shall survey with a radiation detection instrument at intervals not to exceed 12 months. Records of this survey shall be maintained for agency review for three years.

c. Accelerator facilities registered or licensed pursuant to 45.4(3) "a" shall survey for removable contamination at intervals not to exceed six months to determine the degree of contamination.

d. Each time removable shields on self-shielded particle accelerators are opened, a visual survey of the shielding must be performed to observe physical damage. In addition, when these shields are returned to the closed position, a physical radiation survey shall be conducted upon initial reactivating of the accelerator. Records of this survey shall be maintained for agency review for three years.

e. Accelerator facilities registered or licensed pursuant to 45.4(3) "a" shall perform a survey with a radiation detection instrument and surveys for removable contamination before maintenance or servicing of its particle accelerator(s) or associated equipment located in the high radiation area.

f. Radiation levels in all high radiation areas shall be continuously monitored. The monitoring devices shall be electrically independent of the accelerator control and safety interlock systems and capable of providing a readout at the control panel.

g. Upon installation, all area monitoring equipment shall be tested to assure proper operation under operating conditions of the particle accelerator. All area monitors shall be calibrated at intervals not to exceed one year and after each servicing and repair.

h. Whenever applicable, accelerator facilities registered or licensed pursuant to 45.4(3) "a" shall perform surveys at intervals not to exceed six months to determine the amount of airborne particulate radioactivity present.

i. All surveys shall be made in accordance with the written procedures established by the radiation safety officer or a qualified expert who is acceptable to the agency.

j. Records of all radiation protection surveys, calibrations, and instrumentation tests shall be maintained at the accelerator facility for inspection by the agency.

45.4(12) Radiation safety officer.

a. Each registrant shall appoint a radiation safety officer that meets the following requirements:

(1) Possesses a high school diploma or a certificate of high school equivalency based on the GED test;

(2) Documents two years of radiation protection experience.

b. The specific duties of the RSO include, but are not limited to, the following:

(1) To establish and oversee operating, emergency, and ALARA procedures and to review them regularly to ensure that the procedures are current and conform with these rules;

(2) To oversee and approve all phases of the training program for accelerator operators so that appropriate and effective radiation protection practices are taught;

(3) To ensure that required radiation surveys are performed and documented in accordance with these rules, including any corrective measures when levels of radiation exceed established limits;

(4) To ensure that personnel monitoring devices are calibrated and used properly by occupationally exposed personnel, that records are kept of the monitoring results, and that timely notifications are made as required by 641—Chapter 40;

- (5) To ensure that any required interlock switches and warning signals are functioning and that radiation signs, ropes, and barriers are properly posted and positioned;
- (6) To investigate and report to the agency each known or suspected case of radiation exposure to an individual or radiation level detected in excess of limits established by these rules and each theft or loss of source(s) of radiation, to determine the cause, and to take steps to prevent its recurrence;
- (7) To have a thorough knowledge of management policies and administrative procedures of the licensee or registrant;
- (8) To assume control and have the authority to institute corrective actions including shutdown of operations when necessary in emergency situations or unsafe conditions;
- (9) To maintain records as required by these rules;
- (10) To ensure the proper storing, labeling, and use of the accelerator;
- (11) To ensure that inspection and maintenance programs are performed in accordance with 45.1(6), 45.1(8), 45.4(10)“c”; and
- (12) To ensure that personnel are complying with these rules and the operating and emergency procedures of the registrant.

641—45.5(136C) Radiation safety requirements for analytical X-ray equipment.

45.5(1) Purpose and scope. This rule provides special requirements for analytical X-ray equipment. The requirements of this rule are in addition to, and not in substitution for, 641—Chapters 38, 39, and 40. The requirements of rules 641—45.1(136C) to 641—45.4(136C) do not apply.

45.5(2) Definitions. For the purpose of this subrule, definitions in 641—Chapter 38 may also apply. As used in this rule, the following definitions apply:

“*Analytical X-ray equipment*” means equipment used for X-ray diffraction or fluorescence analysis.

“*Analytical X-ray system*” means a group of components utilizing X-rays or gamma rays to determine the elemental composition or to examine the microstructure of materials.

“*Fail-safe characteristics*” means a design feature which causes beam port shutters to close, or otherwise prevents emergence of the primary beam, upon the failure of a safety or warning device.

“*Local components*” means part of an analytical X-ray system and includes X-ray areas that are struck by X-rays such as radiation source housings, port and shutter assemblies, collimators, sample holders, cameras, goniometers, detectors, and shielding, but does not include power supplies, transformers, amplifiers, readout devices, and control panels.

“*Normal operating procedures*” means step-by-step instructions necessary to accomplish the analysis. These procedures shall include sample insertion and manipulation, equipment alignment, routine maintenance by the registrant or licensee, and data recording procedures, which are related to radiation safety.

“*Open-beam configuration*” means an analytical X-ray system in which an individual could accidentally place some part of his body in the primary beam path during normal operation.

“*Primary beam*” means radiation which passes through an aperture of the source housing by a direct path from the X-ray tube or a radioactive source located in the radiation source housing.

45.5(3) Equipment requirements.

a. Safety device. A device which prevents the entry of any portion of an individual’s body into the primary X-ray beam path or which causes the beam to be shut off upon entry into its path shall be provided on all open-beam configurations. A registrant or licensee may apply to the agency for an exemption from the requirement of a safety device. Such application shall include:

- (1) A description of the various safety devices that have been evaluated;
- (2) The reason each of these devices cannot be used; and
- (3) A description of the alternative methods that will be employed to minimize the possibility of an accidental exposure, including procedures to ensure that operators and others in the area will be informed of the absence of safety devices.

b. Warning devices.

- (1) Open-beam configurations shall be provided with a readily discernible indication of:

1. X-ray tube “on-off” status located near the radiation source housing, if the primary beam is controlled in this manner; or

2. Shutter “open-closed” status located near each port on the radiation source housing, if the primary beam is controlled in this manner.

(2) An easily visible warning light labeled with the words “X-RAY ON,” or words having a similar intent, shall be located:

1. Near any switch that energizes an X-ray tube and shall be illuminated only when the tube is energized; or

2. In the case of a radioactive source, near any switch that opens a housing shutter and shall be illuminated only when the shutter is open.

(3) Warning devices shall be labeled so that their purpose is easily identified. On equipment installed after the effective date of these rules, warning devices shall have fail-safe characteristics.

c. Ports. Unused ports on radiation source housings shall be secured in the closed position in a manner which will prevent casual opening.

d. Labeling. All analytical X-ray equipment shall be labeled with a readily discernible sign or signs bearing the radiation symbol and the words:

(1) “CAUTION—HIGH INTENSITY X-RAY BEAM,” or words having a similar intent, on the X-ray source housing; and

(2) “CAUTION—RADIATION—THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED,” or words having a similar intent, near any switch that energizes an X-ray tube if the radiation source is an X-ray tube; or

(3) “CAUTION—RADIOACTIVE MATERIAL,” or words having a similar intent, on the source housing in accordance with 641—40.63(136C) if the radiation source is a radionuclide.

e. Shutters. On open-beam configurations, each port on the radiation source housing shall be equipped with a shutter that cannot be opened unless a collimator or a coupling has been connected to the port.

f. Radiation source housing. Each radiation source housing shall be subject to the following requirements:

(1) Each X-ray tube housing shall be equipped with an interlock that shuts off the tube if it is removed from the radiation source housing or if the housing is disassembled.

(2) Each radioactive source housing or port cover or each X-ray tube housing shall be so constructed that, with all shutters closed, the radiation measured at a distance of 5 centimeters from its surface is not capable of producing a dose in excess of 2.5 millirems (0.025 mSv) in one hour. For systems utilizing X-ray tubes, this limit shall be met at any specified tube rating.

g. Generator cabinet. Each X-ray generator shall be supplied with a protective cabinet which limits leakage radiation measured at a distance of 5 centimeters from its surface such that it is not capable of producing a dose in excess of 0.25 millirem (2.5 mSv) in one hour.

45.5(4) Area requirements.

a. Radiation levels. The local components of an analytical X-ray system shall be located and arranged and shall include sufficient shielding or access control such that no radiation levels exist in any area surrounding the local component group which could result in a dose to an individual present therein in excess of the dose limits given in 641—40.26(136C). For systems utilizing X-ray tubes, these levels shall be met at any specified tube rating.

b. Surveys.

(1) Radiation surveys, as required by 641—40.36(136C), of all analytical X-ray systems sufficient to show compliance with 45.5(4) “a” shall be performed:

1. Upon installation of the equipment, and at least once every 12 months thereafter;

2. Following any change in the initial arrangement, number, or type of local components in the system;

3. Following any maintenance requiring the disassembly or removal of a local component in the system;

4. During the performance of maintenance and alignment procedures if the procedures require the presence of a primary X-ray beam when any local component in the system is disassembled or removed;

5. Anytime a visual inspection of the local components in the system reveals an abnormal condition; and

6. Whenever personnel monitoring devices show a significant increase over the previous monitoring period or the readings are approaching the limits specified in 641—40.15(136C).

(2) Radiation survey measurements shall not be required if a registrant or licensee can demonstrate compliance with 45.5(4) “a” to the satisfaction of the agency.

c. Posting. Each area or room containing analytical X-ray equipment shall be conspicuously posted with a sign or signs bearing the radiation symbol and the words “CAUTION—X-RAY EQUIPMENT” or words having a similar intent in accordance with 641—subrule 40.61(1).

45.5(5) Operating requirements.

a. Procedures. Normal operating procedures shall be written and available to all analytical X-ray equipment workers. No individual shall be permitted to operate analytical X-ray equipment in any manner other than that specified in the procedures unless such individual has obtained written approval of the radiation safety officer.

b. Bypassing. No individual shall bypass a safety device or interlock unless such individual has obtained the approval of the radiation safety officer. Such approval shall be for a specified period of time. When a safety device or interlock has been bypassed, a readily discernible sign bearing the words “SAFETY DEVICE NOT WORKING,” or words having a similar intent, shall be placed on the radiation source housing.

c. Repair or modification of X-ray tube systems. Except as specified in 45.5(5) “b,” no operation involving removal of covers, shielding materials or tube housings or modifications to shutters, collimators, or beam stops shall be performed without ascertaining that the tube is off and will remain off until safe conditions have been restored. The main switch, rather than interlocks, shall be used for routine shutdown in preparation for repairs.

d. Radioactive source replacement, testing, or repair. Radioactive source housings shall be opened for source replacement, leak testing, or other maintenance or repair procedures only by individuals authorized to specifically conduct such procedures under a license issued by the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state.

45.5(6) Personnel requirements.

a. Instruction. No individual shall be permitted to operate or maintain analytical X-ray equipment unless such individual has received instruction in and demonstrated competence as to:

(1) Identification of radiation hazards associated with the use of the equipment;

(2) Significance of the various radiation warnings, safety devices, and interlocks incorporated into the equipment, or the reasons they have not been installed on certain pieces of equipment and the extra precautions required in such cases;

(3) Proper operating procedures for the equipment;

(4) Recognition of symptoms of an acute localized exposure; and

(5) Proper procedures for reporting an actual or suspected exposure.

b. Personnel monitoring.

(1) Finger or wrist dosimetry devices shall be provided to and shall be used by:

1. Analytical X-ray equipment workers using systems having an open-beam configuration and not equipped with a safety device; and

2. Personnel maintaining analytical X-ray equipment if the maintenance procedures require the presence of a primary X-ray beam when any local component in the analytical X-ray system is disassembled or removed.

(2) Reported dose values shall not be used for the purpose of determining compliance with 641—subrule 40.2(1) unless evaluated by a qualified expert.

641—45.6(136C) Radiation safety requirements for well-logging, wireline service operations and subsurface tracer studies.

45.6(1) Purpose. This rule establishes radiation safety requirements for using sources of radiation for wireline service operations including mineral-logging, radioactive markers, and subsurface tracer studies. The requirements of this rule are in addition to, and not in substitution for, the requirements of 641—Chapters 38, 39, and 40. The requirements of 641—45.1(136C) to 641—45.5(136C) do not apply.

45.6(2) Scope. This rule applies to all licensees or registrants who use sources of radiation for wireline service operations including mineral-logging, radioactive markers, or subsurface tracer studies.

45.6(3) Definitions. For the purpose of this subrule, the definitions of 641—Chapter 38 may also apply. As used in this rule, the following definitions apply:

“Energy compensation source (ECS)” means a small sealed source, with an activity not exceeding 3.7 MBq (100 microcuries), used within a logging tool, or other tool components, to provide a reference standard to maintain the tool’s calibration when in use.

“Fresh water aquifer” means a geologic formation that is capable of yielding fresh water to a well or spring.

“Injection tool” means a device used for controlled subsurface injection of radioactive tracer material.

“Logging assistant” means any individual who, under the direct supervision of a logging supervisor, handles sealed sources or tracers that are not in logging tools or shipping containers or who performs surveys required by 45.6(22).

“Logging supervisor” means the individual who uses licensed material or provides direct supervision in the use of licensed material at a temporary job site and who is responsible to the licensee for ensuring compliance with the requirements of these rules and the conditions of the license.

“Logging tool” means a device used subsurface to perform well-logging.

“Personal supervision” means guidance and instruction by the logging supervisor who is physically present at the temporary job site, who is in personal contact with logging assistants, and who can give immediate assistance.

“Radioactive marker” means licensed material used for depth determination or direction orientation. For purposes of this rule, this term includes radioactive collar markers and radioactive iron nails.

“Safety review” means a periodic review on radiation safety aspects of well-logging provided by the licensee for its employees. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, accidents or errors that have been observed, and opportunities for employees to ask safety questions.

“Source holder” means a housing or assembly into which a sealed source is placed to facilitate the handling and use of the source in well-logging operations.

“Subsurface tracer study” means the release of unsealed licensed material or a substance labeled with licensed material in a single well for the purpose of tracing the movement or position of the material or substance in the well or adjacent formation.

“Surface casing” for protecting fresh water aquifers means a pipe or tube used as a lining in a well to isolate fresh water aquifers from the well.

“Temporary job site” means a place where licensed materials are present for the purpose of performing well-logging or subsurface tracer studies.

“Tritium neutron generator target source” means a tritium source used within a neutron generator tube to produce neutrons for use in well-logging applications.

“Uranium sinker bar” means a weight containing depleted uranium used to pull a logging tool down toward the bottom of a well.

“Well” means a drilled hole in which well-logging may be performed. As used in this rule, “well” includes drilled holes for the purpose of oil, gas, mineral, groundwater, or geological exploration.

“*Well-logging*” means all operations involving the lowering and raising of measuring devices or tools which may contain licensed material or are used to detect licensed materials in wells for the purpose of obtaining information about the well or adjacent formations and which may be used in oil, gas, mineral, groundwater, or geological exploration.

“*Wireline*” means a cable containing one or more electrical conductors which is used to lower and raise logging tools in the well-bore.

“*Wireline service operation*” means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.

45.6(4) Agreement with well owner or operator.

a. A licensee may perform well-logging with a sealed source only after the licensee has a written agreement with the employing well owner or operator. This written agreement must identify who will meet the following requirements:

- (1) If a sealed source becomes lodged in the well, a reasonable effort will be made to recover it;
- (2) A person may not attempt to recover a sealed source in a manner which, in the licensee’s opinion, could result in its rupture;
- (3) The radiation monitoring required in 45.6(8) and 45.6(17) will be performed;
- (4) If the environment, any equipment, or personnel are contaminated with licensed material, they must be decontaminated before release from the site or release for unrestricted use; and
- (5) If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the following requirements must be implemented within 30 days:

1. Each irretrievable well-logging source must be immobilized and sealed in place with a cement plug;

2. There must be a means to prevent inadvertent intrusion on the source, unless the source is not accessible to any subsequent drilling operations; and

3. A permanent identification plaque, constructed of long-lasting material, such as stainless steel, brass, bronze, or Monel, must be mounted at the surface of the well, unless the mounting of the plaque is not practical. The size of the plaque must be at least 17 cm (7 inches) square and 3 mm (1/8-inch) thick.

The plaque must contain:

- The word “Caution”;
- The radiation symbol (the color requirement in 641—40.60(136C) need not be met);
- The date the source was abandoned;
- The name of the well owner or well operator, as appropriate;
- The well name and well identification number(s) or other designation;
- An identification of the sealed source(s) by radionuclide and quantity;
- The depth of the source and depth to the top of the plug; and
- An appropriate warning such as, “Do not reenter this well.”

b. The licensee shall retain a copy of the written agreement for three years after the completion of the well-logging operation.

c. A licensee may apply, pursuant to 641—38.3(136C), for agency approval, on a case-by-case basis, of proposed procedures to abandon an irretrievable well-logging source in a manner not otherwise authorized in 45.6(26) “a”(5).

d. A written agreement between the licensee and the well owner or operator is not required if the licensee and the well owner or operator are part of the same corporate structure or otherwise similarly affiliated. However, the licensee shall still otherwise meet the requirements in 45.6(26) “a”(1) through (5).

45.6(5) Limits on levels of radiation. Sources of radiation shall be used, stored, and transported in such a manner that the transportation requirements of 641—39.5(136C) and the dose limitation requirements of 641—Chapter 40 are met.

45.6(6) Storage precautions.

a. Each source of radiation shall be provided with a storage or transport container. The container shall be provided with a lock, or tamper seal for calibration sources, to prevent unauthorized removal of, or exposure to, the source of radiation.

b. Sources of radiation shall be stored in a manner which will minimize danger from explosion or fire.

45.6(7) Transport precautions. Transport containers shall be physically secured to the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal.

45.6(8) Radiation survey instruments.

a. The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments at each field station to make physical radiation surveys as required by this subrule and by 641—40.36(136C). Instrumentation shall be capable of measuring 0.1 milliroentgen (25.8 nanocoulombs/kg) per hour through at least 50 milliroentgens (12.9 microcoulombs/kg) per hour.

b. Each radiation survey instrument shall be calibrated:

- (1) At intervals not to exceed six months and after each instrument servicing;
- (2) For linear scale instruments, at two points located approximately 1/3 and 2/3 of full-scale on each scale; for logarithmic scale instruments, at midrange of each decade, and at two points of at least one decade; and for digital instruments, at appropriate points; and
- (3) So that accuracy within 20 percent of the true radiation level can be demonstrated on each scale.

c. Calibration records shall be maintained for a period of two years for inspection by the agency.

45.6(9) Leak testing of sealed sources.

a. *Testing and record-keeping requirements.* Each licensee using sealed sources of radioactive material shall have the sources tested for leakage periodically. Records of leak test results shall be kept in units of microcuries (Bq) and maintained for three years after the leak test is performed.

b. *Method of testing.* Tests for leakage shall be performed only by persons specifically authorized to perform such tests by the NRC, an agreement state, or a licensing state. The wipe of a sealed source must be performed using a leak test kit or method approved by the NRC, an agreement state, or a licensing state. The wipe sample must be taken from the nearest assessable point to the sealed source where contamination might accumulate. The test sample shall be analyzed for radioactive contamination, and the analysis shall be capable of detecting the presence of 0.005 microcurie (185 Bq) of radioactive material on the test sample.

c. *Interval of testing.*

(1) Each sealed source of radioactive material (except an energy compensation source (ECS)) shall be tested at intervals not to exceed six months. In the absence of a certificate from a transferor indicating that a test has been made six months prior to the transfer, the sealed source shall not be put into use until tested. If, for any reason, it is suspected that a sealed source may be leaking, it shall be removed from service immediately and tested for leakage as soon as practical.

(2) Each ECS that is not exempt from testing in accordance with 45.6(9)“c”(1) must be tested at intervals not to exceed three years. In the absence of a certificate from a transferor that a test has been made within the three years before the transfer, the ECS may not be used until tested.

d. *Leaking or contaminated sources.*

(1) If the test in 45.6(9)“c” reveals the presence of 0.005 microcurie (185 Bq) or more of removable radioactive material, the licensee shall immediately withdraw the source from use and shall cause it to be decontaminated, repaired, or disposed of by an NRC, agreement state, or licensing state licensee that is authorized to perform these functions. The licensee shall check the equipment associated with the leaking source for radioactive contamination and, if contaminated, have it decontaminated or disposed of by an NRC, agreement state, or licensing state licensee that is authorized to perform these functions.

(2) A report describing the equipment involved, the test results, any contamination which resulted from the leaking source, and the corrective action taken up to the time of the report shall be filed with the agency within five days of receiving the test results.

e. *Exemptions.* The following sources are exempted from the periodic leak test requirements of 45.6(9)“a” to “d”:

- (1) Hydrogen-3 (tritium) sources;
- (2) Sources of radioactive material with a half-life of 30 days or less;
- (3) Sealed sources of radioactive material in gaseous form;

(4) Sources of beta- or gamma-emitting radioactive material with an activity of 100 microcuries (3.7 MBq) or less; and

(5) Sources of alpha- or neutron-emitting radioactive material with an activity of 10 microcuries (0.370 MBq) or less.

45.6(10) Quarterly inventory. Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation. Records of inventories shall be maintained for two years from the date of the inventory for inspection by the agency and shall include the quantities and kinds of sources of radiation, the location where sources of radiation are assigned, the date of the inventory, and the name of the individual conducting the inventory.

45.6(11) Utilization records. Each licensee or registrant shall maintain current records, which shall be kept available for inspection by the agency for two years from the date of the recorded event, showing the following information for each source of radiation:

a. Make, model number, and a serial number or a description of each source of radiation used;

b. The identity of the well-logging supervisor or field unit to whom assigned;

c. Locations where used and dates of use; and

d. In the case of tracer materials and radioactive markers, the utilization record shall indicate the radionuclide and activity used in a particular well.

45.6(12) Design, performance, and certification criteria for sealed sources used in well-logging operations.

a. A licensee may use a sealed source for use in well-logging applications if:

(1) The sealed source is doubly encapsulated construction;

(2) The sealed source contains chemical and physical forms that are as insoluble and nondispersible as practical; and

(3) The sealed source meets the requirements of 45.6(12) "b," "c," and "d."

b. For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source for use in well-logging applications if it meets the requirements of USASI N5.10-1968, "Classification of Sealed Radioactive Sources," or the requirements in 45.6(12) "c" or "d."

c. For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source for well-logging applications if it meets the oil-well-logging requirements of ANSI/HPS N43.6-1997, "Sealed Radioactive Sources—Classification."

d. For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source for use in well-logging applications if the sealed source's prototype has been tested and found to maintain its integrity after each of the following tests.

(1) Temperature. The test source must be held at -40 degrees C for 20 minutes, 600 degrees C for one hour, and then be subject to a thermal shock test with a temperature drop from 600 degrees C within 15 seconds.

(2) Impact test. A 5 kg steel hammer, 2.5 cm in diameter, must be dropped from a height of 1 m onto the test source.

(3) Vibration test. The test source must be subject to a vibration from 25 Hz to 500 Hz at 5 g amplitude for 30 minutes.

(4) Puncture test. A one gram hammer and pin, 0.3 cm pin diameter, must be dropped from a height of 1 m onto the test source.

(5) Pressure test. The test source must be subject to an external pressure of 1.695×10^7 pascals (24,600 pounds per square inch absolute).

e. The requirements in 45.6(12) "a," "b," "c," and "d" do not apply to sealed sources that contain licensed material in gaseous form.

f. The requirements of 45.6(12) "a," "b," "c," and "d" do not apply to energy compensation sources (ECS). ECSs must be registered with the NRC, licensing state, or agreement state.

45.6(13) Labeling.

a. Each source, source holder, or logging tool containing radioactive material shall bear a durable, legible, and clearly visible marking or label, which has, as a minimum, the standard radiation caution symbol, without the conventional color requirement, and the following wording:

DANGER¹
RADIOACTIVE

This labeling shall be on the smallest component transported as a separate piece of equipment.

b. Each transport container shall have permanently attached to it a durable, legible, and clearly visible label which has, as a minimum, the standard radiation caution symbol and the following wording:

DANGER¹
RADIOACTIVE
NOTIFY CIVIL AUTHORITIES
[OR NAME OF COMPANY]

45.6(14) *Inspection and maintenance.*

a. Each licensee or registrant shall conduct, at intervals not to exceed six months, a program of inspection and maintenance of source holders, logging tools, source handling tools, storage containers, transport containers, and injection tools to ensure proper labeling and physical condition. Records of inspection and maintenance shall be maintained for a period of two years for inspection by the agency.

b. If any inspection conducted pursuant to 45.6(14) “*a*” reveals damage to labeling or components critical to radiation safety, the device shall be removed from service until repairs have been made.

c. If a sealed source is stuck in the source holder, the licensee shall not perform any operation, such as drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state to perform this operation.

d. The repair, opening, or modification of any sealed source shall be performed only by persons specifically authorized to do so by the agency, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state.

45.6(15) *Training requirements.*

a. No licensee or registrant shall permit any individual to act as a logging supervisor as defined in this rule until such individual has:

(1) Received, in a course recognized by the agency, the U.S. Nuclear Regulatory Commission, an agreement state, or a licensing state, instruction in the subjects outlined in Appendix E of this chapter and demonstrated an understanding thereof;

(2) Read and received instruction in the rules contained in this chapter and the applicable sections of 641—Chapters 38, 39, and 40 or their equivalent, conditions of appropriate license or certificate of registration, and the licensee’s or registrant’s operating and emergency procedures, and demonstrated an understanding thereof; and

(3) Demonstrated competence to use sources of radiation, related handling tools, and radiation survey instruments which will be used on the job.

b. No licensee or registrant shall permit any individual to assist in the handling of sources of radiation until such individual has:

(1) Read or received instruction in the licensee’s or registrant’s operating and emergency procedures and demonstrated an understanding thereof; and

(2) Demonstrated competence to use, under the direct supervision of the logging supervisor, the sources of radiation, related handling tools, and radiation survey instruments which will be used on the job.

c. The licensee or registrant shall maintain employee training records for inspection by the agency for two years following termination of the individual’s employment.

45.6(16) *Operating and emergency procedures.* Each licensee or registrant shall develop and follow written operating and emergency procedures that cover:

a. The handling and use of sources of radiation, including the use of sealed sources in wells without surface casing for protecting fresh water aquifers, if appropriate;

¹or CAUTION

b. The use of remote handling tools for handling sealed sources and radioactive tracer material except low-activity calibration sources;

- c. Methods and occasions for conducting radiation surveys, including surveys for detecting contamination, as required by 45.6(22);
- d. Minimizing personnel exposure, including exposures from inhalation and ingestion of licensed tracer materials;
- e. Methods and occasions for locking and securing stored licensed or registered materials;
- f. Personnel monitoring and the use of personnel monitoring equipment;
- g. Transportation of licensed or registered materials to field stations or temporary job sites, packaging of licensed or registered materials for transport in vehicles, placarding of vehicles when needed, and physically securing licensed materials in transport vehicles during transportation to prevent accidental loss, tampering, or unauthorized removal;
- h. Picking up, receiving, and opening packages containing licensed or registered materials, in accordance with 641—40.65(136C);
- i. For the use of tracers, decontamination of the environment, equipment, and personnel;
- j. Maintenance of records generated by well logging personnel at temporary job sites;
- k. The inspection and maintenance of sealed sources, source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars as required by 45.6(14);
- l. Identifying and reporting defects and noncompliance;
- m. Actions to be taken if a sealed source is lodged in a well;
- n. Notifying proper persons in the event of an accident; and
- o. Actions to be taken if a sealed source is ruptured that include actions to prevent the spread of contamination and minimize inhalation and ingestion of licensed materials and actions to obtain suitable radiation survey instruments as required in 45.6(8).

45.6(17) Personnel monitoring.

a. No licensee or registrant shall permit any individual to act as a logging supervisor or to assist in the handling of sources of radiation unless each such individual wears, at all times during the handling of licensed radioactive materials, a film badge, OSL device or thermoluminescent dosimeter (TLD) that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP). Each film badge, OSL device or TLD shall be assigned to and worn by only one individual. Film badges must be replaced at least monthly and OSL devices and TLDs replaced at least quarterly. After replacement, each film badge, OSL device or TLD must be promptly processed.

b. The licensee shall provide bioassay services to individuals using licensed materials in subsurface tracer studies if required by the license.

c. Personnel monitoring records and bioassay results shall be maintained for inspection until the agency authorizes disposition.

45.6(18) Security. During each logging or tracer application, the logging supervisor or other designated employee shall maintain direct surveillance of the operation to protect against unauthorized or unnecessary entry into a restricted area, as defined in 641—Chapter 38.

45.6(19) Handling tools. The licensee shall provide and require the use of tools that will ensure remote handling of sealed sources other than low activity calibration sources.

45.6(20) Subsurface tracer studies.

a. Protective gloves and other appropriate protective clothing and equipment shall be used by all personnel handling radioactive tracer material. Precautions shall be taken to avoid ingestion or inhalation of radioactive material.

b. No licensee shall cause the injection of radioactive material into potable aquifers without prior written authorization from the agency and any other appropriate state agency.

45.6(21) Particle accelerators. No licensee or registrant shall permit aboveground testing of particle accelerators, designed for use in well-logging, which results in the production of radiation, except in areas or facilities so controlled or shielded that the requirements of 641—40.15(136C) and 641—40.26(136C), as applicable, are met.

45.6(22) Radiation surveys.

a. Radiation surveys or calculations shall be made and recorded for each area where radioactive materials are used and stored.

b. Radiation surveys shall be made and recorded for the radiation levels in occupied positions and on the exterior of each vehicle used to transport radioactive material. Such surveys shall include each source of radiation or combination of sources to be transported in the vehicle.

c. If the sealed source assembly is removed from the logging tool before departing the job site, the logging tool detector shall be energized, or a survey meter used, to ensure that the logging tool is free of contamination.

d. Radiation surveys shall be made and recorded at the job site or wellhead for each tracer operation, except those using hydrogen-3, carbon-14, and sulfur-35. These surveys shall include measurements of radiation levels before and after the operation.

e. Records required pursuant to 45.6(22)“a” to “d” shall include the dates, the identification of individual(s) making the survey, the identification of survey instrument(s) used, and an exact description of the location of the survey. Records of these surveys shall be maintained for inspection by the agency for two years after completion of the survey.

45.6(23) Documents and records required at field stations. Each licensee or registrant shall maintain, for inspection by the agency, the following documents and records for the specific devices and sources used at the field station:

- a. Appropriate license, certificate of registration, or equivalent document(s);
- b. Operating and emergency procedures;
- c. Applicable regulations;
- d. Records of the latest survey instrument calibrations pursuant to 45.6(8);
- e. Records of the latest leak test results pursuant to 45.6(9);
- f. Records of quarterly inventories required pursuant to 45.6(10);
- g. Utilization records required pursuant to 45.6(11);
- h. Records of inspection and maintenance required pursuant to 45.6(14);
- i. Survey records required pursuant to 45.6(22); and
- j. Training records required pursuant to 45.6(15).

45.6(24) Documents and records required at temporary job sites. Each licensee or registrant conducting operations at a temporary job site shall have the following documents and records available at that site for inspection by the agency:

- a. Operating and emergency procedures;
- b. Survey records required pursuant to 45.6(22) for the period of operation at the site;
- c. Evidence of current calibration for the radiation survey instruments in use at the site;
- d. When operating in the state under reciprocity, a copy of the appropriate license, certificate of registration, or equivalent document(s); and
- e. Shipping papers for the transportation of radioactive material.

45.6(25) Notification of incidents, abandonment, and lost sources.

a. Notification of incidents and sources lost in other than downhole logging operations shall be made in accordance with appropriate provisions of 641—Chapter 40.

b. Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee shall:

(1) Monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations; and

(2) Notify the agency immediately by telephone and subsequently, within 30 days, by confirmatory letter if the licensee knows or has reason to believe that a sealed source has been ruptured. This letter shall identify the well or other location, describe the magnitude and extent of the escape of radioactive material, assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences.

c. When it becomes apparent that efforts to recover the radioactive source will not be successful, the licensee shall:

(1) Advise the well operator of the regulations of the appropriate state agency regarding abandonment and an appropriate method of abandonment, which shall include:

1. The immobilization and sealing in place of the radioactive source with a cement plug;
2. The setting of a whipstock or other deflection device; and
3. The mounting of a permanent identification plaque at the surface of the well, containing the appropriate information required by 45.6(25) "d."

(2) Notify the agency by telephone, giving the circumstances of the loss, and request approval of the proposed abandonment procedures, or specify the implemented abandonment before receiving approval because the licensee believed there was an immediate threat to public health and safety; and

(3) File a written report with the agency within 30 days of the abandonment. The licensee shall send a copy of the report to the appropriate state agency that issued permits or otherwise approved of the drilling operation. The report shall contain the following information:

1. Date of occurrence;
2. A description of the well-logging source involved, including the radionuclide and its quantity, chemical, and physical form;
3. Surface location and identification of the well;
4. Results of efforts to immobilize and seal the source in place;
5. A brief description of the attempted recovery effort;
6. Depth of the source;
7. Depth of the top of the cement plug;
8. Depth of the well;
9. The immediate threat to public health and safety justification for implementing abandonment if prior approval was not obtained in accordance with 45.6(25) "c"(2);
10. Any other information, such as a warning statement, contained on the permanent identification plaque; and
11. The names of state agencies receiving a copy of this report.

d. Whenever a sealed source containing radioactive material is abandoned downhole, the licensee shall provide a permanent plaque² for posting the well or well-bore. This plaque shall:

- (1) Be constructed of long-lasting material, such as stainless steel or Monel; and
- (2) Contain the following information engraved on its face:

1. The word "CAUTION";
2. The radiation symbol without the conventional color requirement;
3. The date of abandonment;
4. The name of the well operator or well owner;
5. The well name and well identification number(s) or other designation;
6. The sealed source(s) by radionuclide and activity;
7. The source depth and the depth to the top of the plug; and
8. An appropriate warning, depending on the specific circumstances of each abandonment.³

e. The licensee shall immediately notify the agency by telephone and subsequently by confirming letter if the licensee knows or has reason to believe that radioactive material has been lost in or to an underground potable aquifer. Such notice shall designate the well location and shall describe the magnitude and extent of loss of radioactive material, assess the consequences of such loss, and explain efforts planned or being taken to mitigate these consequences.

45.6(26) Reserved.

45.6(27) *Radioactive markers.* The licensee may use radioactive markers in wells only if the individual markers contain quantities of licensed material not exceeding the quantities specified in 641—Chapter 39, Appendix B, Exempt Quantities. The use of markers is subject only to the requirements of 45.6(10).

45.6(28) *Uranium sinker bars.* The licensee may use uranium sinker bars in well-logging applications only if they are legibly impressed with the words "CAUTION—RADIOACTIVE-DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES [or Company name] IF FOUND."

45.6(29) *Use of a sealed source in a well without a surface casing.* The licensee may use a sealed source in a well without a surface casing for protecting fresh water aquifers only if the licensee follows a procedure for reducing the probability of the source's becoming lodged in the well. The procedure must be approved by the NRC or licensing or agreement state.

45.6(30) *Energy compensation source.* The licensee may use an energy compensation source (ECS) which is contained within a logging tool, or other tool components, only if the ECS contains quantities of licensed material not exceeding 100 microcuries (3.7 MBq).

a. For well-logging applications with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 45.6(9) to 45.6(11).

b. For well-logging applications without a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of 45.6(4), 45.6(9) to 45.6(11), 45.6(25), and 45.6(29).

45.6(31) *Tritium neutron generator target source.*

a. Use of a tritium neutron generator target source that contains quantities not exceeding 30 curies (1110 MBq) and that is in a well with a surface casing to protect fresh water aquifers is subject to the requirements of this rule except subrules 45.6(4), 45.6(12), and 45.6(25).

b. Use of a tritium neutron generator target source that contains quantities exceeding 30 curies (1110 MBq) or that is in a well without a surface casing to protect fresh water aquifers is subject to the requirements of this rule except subrule 45.6(12).

²An example of a suggested plaque is shown in Appendix F of this chapter.

³Appropriate warnings may include: (a) "Do not drill below plug-back depth"; (b) "Do not enlarge casing"; or (c) "Do not re-enter the hole", followed by the words, "before contacting the Iowa Department of Public Health."

CHAPTER 45—APPENDIX A

SUBJECTS FOR INSTRUCTION OF
RADIOGRAPHER'S ASSISTANTS

Training provided to qualify individuals as radiographer's assistants in compliance with 45.1(10) shall be presented on a formal basis. The training shall include the following subjects:

- I. Fundamentals of radiation safety
 - A. Characteristics of radiation
 - B. Units of radiation dose and quantity of radioactivity
 - C. Significance of radiation dose
 1. Radiation protection standards
 2. Biological effects of radiation
 3. Case histories of radiography accidents
 - D. Levels of radiation from sources of radiation
 - E. Methods of controlling radiation dose
 1. Working time
 2. Working distances
 3. Shielding
- II. Radiation detection instrumentation to be used
 - A. Use of radiation survey instruments
 1. Operation
 2. Calibration
 3. Limitations
 - B. Survey techniques
 - C. Use of personnel monitoring equipment
 1. Film badges
 2. Thermoluminescent dosimeters (TLDs)
 3. Pocket dosimeters
 4. OSL devices
- III. The requirements of pertinent federal and state regulations
- IV. The licensee's or registrant's written operating and emergency procedures
- V. Radiographic equipment to be used
 - A. Remote handling equipment
 - B. Operation and control of radiographic exposure devices and sealed sources, including pictures or models of source assemblies (pigtailed)
 - C. Storage and transport containers, source changers
 - D. Operation and control of X-ray equipment
 - E. Collimators

CHAPTER 45—APPENDIX B

GENERAL REQUIREMENTS FOR INSPECTION OF
INDUSTRIAL RADIOGRAPHIC EQUIPMENT

- I. Panoramic devices (devices in which the sealed source is physically removed from the shielded container during exposure) shall be inspected for:
 - A. Radiographic exposure unit
 1. Abnormal surface radiation levels anywhere on camera, collimator, or guide tube;
 2. Condition of safety plugs;
 3. Proper operation of locking mechanism;
 4. Condition of pigtail connector;
 5. Condition of carrying device (straps, handle, etc.);
 6. Proper labeling.
 - B. Source tube
 1. Rust, dirt, or sludge buildup inside the source tube;
 2. Condition of source tube connector;
 3. Condition of source stop;
 4. Kinks or damage that could prevent proper operation;
 5. Presence of radioactive contamination.
 - C. Control cables and drive mechanism
 1. Proper drive mechanism with camera, as appropriate;
 2. Changes in general operating characteristics;
 3. Condition of connector on drive cable;
 4. Drive cable flexibility, wear, and rust;
 5. Excessive wear or damage to crank assembly parts;
 6. Damage to drive cable conduit that could prevent the cable from moving easily;
 7. Connection of the control cable connector with the pigtail connector for proper mating;
 8. Proper operation of source position indicator, if applicable;
 9. Presence of radioactive contamination.
- II. Directional beam devices shall be inspected for:
 - A. Abnormal surface radiation;
 - B. Changes in the general operating characteristics of the unit;
 - C. Proper operation of shutter mechanism;
 - D. Chafing or binding of shutter mechanism;
 - E. Damage to the device that might impair its operation;
 - F. Proper operation of locking mechanism;
 - G. Proper drive mechanism with camera, as appropriate;
 - H. Condition of carrying device (strap, handle, etc.);
 - I. Proper labeling.
- III. X-ray equipment shall be inspected for:
 - A. Change in the general operating characteristics of the unit;
 - B. Wear of electrical cables and connectors;
 - C. Proper labeling of console;
 - D. Proper console with machine, as appropriate;
 - E. Proper operation of locking mechanism;
 - F. Timer run-down cutoff;
 - G. Damage to tube head housing that might result in excessive radiation levels.

CHAPTER 45—APPENDIX C

TIME REQUIREMENTS FOR RECORD KEEPING

| Specific Section | Name of Record | Time Interval Required for Record Keeping |
|---------------------------|---|---|
| 45.1(4) | Receipt, transfer and disposal. | 3 years. |
| 45.1(5) | Survey instrument calibrations. | 3 years. |
| 45.1(6) | Quarterly inventory. | 3 years. |
| 45.1(7) | Utilization logs. | 3 years. |
| 45.1(8) | Quarterly inspection and maintenance. | 3 years. |
| 45.1(9) | High radiation area control devices or alarm systems. | Until disposal is authorized by the agency. |
| 45.1(10) | Training and testing records. | 3 years. |
| 45.1(12) | Pocket dosimeter readings. | 3 years. |
| | Pocket dosimeter calibrations. | 3 years. |
| | Film badge, OSL device, or TLD reports. | Until the agency terminates the license. |
| | Alarming ratemeter calibrations. | 3 years. |
| | Alarming ratemeter functions. | 3 years. |
| | Estimates of overexposures. | Until the agency terminates the license. |
| 45.1(19) | Current operating and emergency procedures. | Until the license is terminated. |
| | Superseded material. | 3 years after change. |
| 40.81(1) | Internal audit program. | 3 years. |
| 45.1(11) | Radiographer audits. | 3 years. |
| 45.2(5) and 45.3(7) | Radiation surveys. | 2 years or until disposal is authorized by the agency if a survey was used to determine an individual's exposure. |
| 45.1(16) | Records at temporary job sites. | During temporary job site operations. |
| 45.2(6) and 45.3(8) | Annual evaluation of enclosed X-ray systems. | 2 years. |
| 45.3(5) | Leak tests. | 3 years. |
| 45.2(6) | Evaluation of certified cabinet X-ray systems. | 2 years. |

CHAPTER 45—APPENDIX D

OPERATING AND EMERGENCY PROCEDURES

The licensee's or registrant's operating and emergency procedures shall include instructions in at least the following:

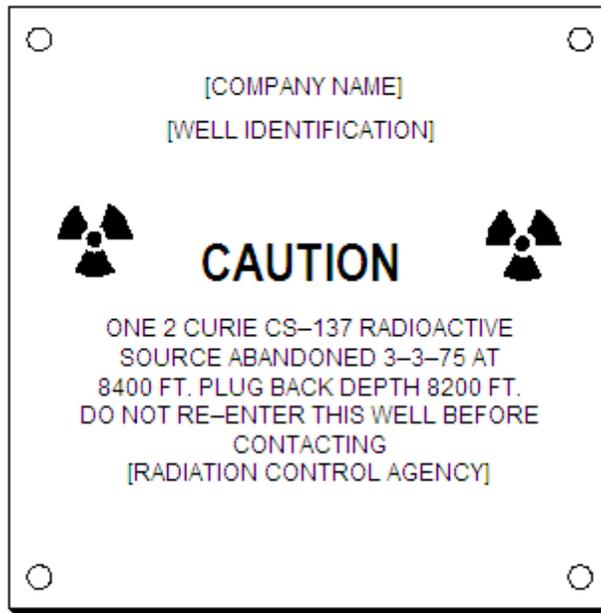
- A. Handling and use of sources of radiation for industrial radiography such that no individual is likely to be exposed to radiation doses that exceed the limits established in 641—Chapter 40;
- B. Methods and occasions for conducting radiation surveys, including lock-out survey requirements;
- C. Methods for controlling access to industrial radiography areas;
- D. Methods and occasions for locking and securing sources or radiation;
- E. Personnel monitoring and the use of personnel monitoring equipment, including steps to be taken immediately by industrial radiographic personnel in the event a pocket dosimeter is found to be off-scale;
- F. Methods of transporting equipment to field locations, including packing of sources of radiation in the vehicles, placarding of vehicles, and controlling of sources of radiation during transportation (including applicable U.S. Department of Transportation requirements);
- G. Methods or procedures for minimizing exposure of individuals in the event of an accident, including procedures for a disconnect accident, a transportation accident, and loss of a sealed source;
- H. Procedures for notifying proper personnel in the event of an accident;
- I. Specific posting requirements;
- J. Maintenance of records (Appendix C); and
- K. Inspection and maintenance of radiographic exposure devices, source changers, storage containers, transport containers, source guide tubes, crank-out devices, and radiation machines.

CHAPTER 45—APPENDIX E

SUBJECTS TO BE INCLUDED IN TRAINING COURSES FOR LOGGING SUPERVISORS

- I. Fundamentals of radiation safety.
 - A. Characteristics of radiation.
 - B. Units of radiation dose and quantity of radioactivity.
 - C. Significance of radiation dose.
 - 1. Radiation protection standards.
 - 2. Biological effects of radiation dose.
 - D. Levels of radiation from sources of radiation.
 - E. Methods of minimizing radiation dose.
 - 1. Working time.
 - 2. Working distances.
 - 3. Shielding.
 - F. Radiation safety practices including prevention of contamination and methods of decontamination.
- II. Radiation detection instrumentation to be used.
 - A. Use of radiation survey instruments.
 - 1. Operation.
 - 2. Calibration.
 - 3. Limitations.
 - B. Survey techniques.
 - C. Use of personnel monitoring equipment.
- III. Equipment to be used.
 - A. Handling equipment.
 - B. Sources of radiation.
 - C. Storage and control of equipment.
 - D. Operation and control of equipment.
- IV. The requirements of pertinent federal and state regulations.
 - V. The licensee's or registrant's written operating and emergency procedures.
- VI. The licensee's or registrant's record-keeping procedures.

CHAPTER 45—APPENDIX F

EXAMPLE OF PLAQUE FOR IDENTIFYING WELLS CONTAINING SEALED SOURCES
CONTAINING RADIOACTIVE MATERIAL ABANDONED DOWNHOLE

The size of the plaque should be convenient for use on active or inactive wells, e.g., a 7-inch square. Letter size of the word “CAUTION” should be approximately twice the letter size of the rest of the information, e.g., ½-inch and ¼-inch letter size, respectively.

These rules are intended to implement Iowa Code chapters 136B and 136C.

- [Filed 4/7/80, Notice 2/6/80—published 4/30/80, effective 7/1/80]
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[Filed ARC 1639C (Notice ARC 1470C, IAB 5/28/14), IAB 10/1/14, effective 11/5/14]
[Filed ARC 3746C (Notice ARC 3578C, IAB 1/17/18), IAB 4/11/18, effective 5/16/18]

CHAPTER 80
LOCAL PUBLIC HEALTH SERVICES
[Prior to 8/3/94, "Homemaker-Home Health Aide Services"]
[Prior to 4/11/07, see also 641—Ch 79]

641—80.1(135) Purpose. The purpose of the local public health services (LPHS) contract is to implement the core public health functions, deliver essential public health services, and increase the capacity of local boards of health (LBOH) to promote healthy people and healthy communities.
[ARC 1925C, IAB 4/1/15, effective 7/1/15]

641—80.2(135) Definitions. For the purposes of these rules, the following definitions apply:

"Allocation" means the process to distribute funds.

"Appropriation" means the funding category.

"Authorized agency" means a contractor or a private nonprofit or governmental organization delivering all or part of the LPHS funded by the LPHS contract.

"Community" means the aggregate of persons with common characteristics such as race, ethnicity, age, or occupation or other similarities such as location.

"Consumer" means an individual, family, or community utilizing essential public health services through the LPHS contract.

"Contractor" means a local board of health (LBOH).

"Core public health functions" means the functions of assessment, policy development, and assurance:

1. Assessment means regular collection, analysis, interpretation, and communication of information about health conditions, risks, and assets in a community.

2. Policy development means development, implementation, and evaluation of plans and policies, for public health in general and priority health needs in particular, in a manner that incorporates scientific information and community values in accordance with state public health policy.

3. Assurance means ensuring, by encouragement, regulation, or direct action, that programs and interventions which maintain and improve health are carried out.

"Department" means the Iowa department of public health.

"Elderly" means an individual aged 60 years and older.

"Essential public health services" means activities carried out by the authorized agency fulfilling core public health functions. Essential public health services include:

1. Monitoring health status to identify and solve community health problems.

2. Diagnosing and investigating health problems and health hazards in the community.

3. Informing, educating and empowering people about health issues.

4. Mobilizing community partnerships and action to identify and solve health problems.

5. Developing policies and plans that support individual and community health efforts.

6. Enforcing laws and regulations that protect health and ensure safety.

7. Linking people to needed health services and assuring the provision of health care when otherwise unavailable.

8. Assuring a competent public health and personal health care workforce.

9. Evaluating effectiveness, accessibility, and quality of personal and population-based health services.

10. Researching for new insights and innovative solutions to health problems.

"Evaluation" means the process to measure the effectiveness of interventions by measuring outcomes against previously established goals and objectives.

"Financial resources" means the unrestricted assets owned by a consumer and, if applicable, the consumer's spouse. The place of residence and one vehicle are exempt from consideration of resources.

"Formula" means the mathematical calculation applied to the state appropriation to determine the amount of available funds to be distributed to each county.

"Health promotion" means organizational, economic and environmental supports and education to stimulate healthy behaviors in individuals, groups or communities.

“*Home care aide*” means an individual who is trained and supervised to provide services, care, and emotional support to consumers in the home or in the community.

“*Income*” means all sources of revenue for the consumer and, if applicable, the consumer’s spouse.

“*Local board of health*” or “*LBOH*” means a county, city or district board of health as defined in Iowa Code section 137.102.

“*Low income*” means the U.S. Census Bureau’s Small Area Income and Poverty Estimates (SAIPE) (All Ages in Poverty) used to determine low income.

“*LPHS*” means local public health services.

“*Nonprofit*” means an entity meeting the requirements for tax-exempt status under the U.S. Internal Revenue Code.

“*Orientation*” means a period or process of introduction and adjustment to adapt the individual’s knowledge and skills from prior education to the individual’s current job duties.

“*Outcome*” means an action or event that follows as a result or consequence of the provision of a service or support.

“*Population-based services*” means interventions or activities for a community to promote health and to prevent disease, injury, disability, premature death, and exposure to environmental hazards.

“*Procedures*” means the steps to be taken to implement a policy.

“*Restricted assets*” means assets typically involving a penalty for early withdrawal, such as IRA accounts, KEOGH accounts, 401(k) accounts, employee retirement accounts, and other deferred tax protected assets involving a penalty for early withdrawal.

“*Sliding fee scale*” means a scale of consumer fee responsibility based on an assessment of the consumer’s ability to pay all or a portion of the charge for services.

“*Unrestricted assets*” means assets that can be converted to cash.

“*Vulnerable population*” means individuals or groups in the community who are unable to promote and protect their personal or environmental health.

[ARC 1925C, IAB 4/1/15, effective 7/1/15; ARC 3747C, IAB 4/11/18, effective 5/16/18]

641—80.3(135) Local public health services (LPHS). Local public health services improve the health of the entire community; prevent illness; enhance the quality of life; provide services to safeguard the health and wellness of the community; reduce, prevent, and delay institutionalization of consumers; and preserve and protect families.

80.3(1) Priority population. The LPHS contract serves individuals throughout the lifespan and prioritizes service to vulnerable populations in Iowa.

80.3(2) Appropriations. The fiscal appropriations which assist in supporting LPHS are determined annually by the general assembly.

80.3(3) Contractor assurance. In order to receive funding, the contractor shall provide to the department assurance that authorized agencies meet all applicable federal, state, and local requirements. The contractor may directly provide or subcontract all or part of the delivery of services. The contractor shall ensure that each authorized agency complies with Title IV of the Civil Rights Act, the Americans with Disabilities Act of 1990 (ADA), and Section 504 of the Rehabilitation Act of 1973 and with affirmative action requirements. In addition, the contractor shall ensure that each authorized agency has, at a minimum, the following:

- a. A governing board;
- b. Program policies and procedures;
- c. A consumer appeals process;
- d. Records appropriate to the level of consumer care;
- e. Evidence of staff supervision;
- f. Personnel policies and procedures which, at a minimum, include:
 - (1) Delegation of authority and responsibility for agency administration;
 - (2) A staff training program for the identification and reporting of child and dependent adult abuse to the department pursuant to Iowa Code sections 232.69 and 235B.3;
 - (3) An employee grievance procedure;

- (4) Annual employee performance evaluations;
- (5) A nondiscrimination policy;
- (6) An employee orientation program; and
- (7) Current job descriptions;

g. Fiscal management, which shall, at a minimum, include:

- (1) An annual budget;
- (2) Fiscal policies and procedures which follow generally accepted accounting practices; and
- (3) An annual audit performed according to usual and customary accounting principles and practices;

h. Evaluation of agency and program activities which shall, at a minimum, include:

- (1) Evidence of an annual evaluation; and
- (2) Methods of reporting outcomes of evaluation to the LBOH.

80.3(4) Coordination of public health services.

a. The authorized agency is responsible for determining the ability of a job applicant to meet the requirements outlined in the job description. At a minimum, individuals responsible for coordinating public health services shall meet one of the following criteria:

- (1) Be a registered nurse (RN) who is licensed to practice nursing in the state of Iowa and who has a recommended minimum of two years of related public health experience; or
- (2) Possess a bachelor's degree or higher in public health, health administration, nursing, health and human services, or other applicable field from an accredited college or university; or
- (3) Be an individual with two years of related public health experience.

b. Individuals who are responsible for the coordination of public health services on or before June 30, 2015, are exempt from the criteria in paragraph 80.3(4) "a."

80.3(5) Coordination of home care aide services.

a. The authorized agency is responsible for determining the ability of a job applicant to meet the requirements outlined in the job description. At a minimum, individuals performing coordination of home care aide services shall meet one of the following criteria:

- (1) Be a registered nurse (RN) licensed to practice nursing in the state of Iowa; or
- (2) Possess a bachelor's degree or higher in public health, health administration, nursing, health and human services, or other applicable field from an accredited college or university; or
- (3) Be a licensed practical nurse (LPN) licensed to practice nursing in the state of Iowa; or
- (4) Be an individual with two years of related public health experience.

b. Individuals who are responsible for the coordination of home care aide services on or before June 30, 2015, are exempt from the criteria in paragraph 80.3(5) "a."

80.3(6) Home care aide services.

a. The authorized agency shall ensure that each individual assigned to perform home care aide services meets one of the following:

(1) Be an individual who has completed orientation to home care in accordance with agency policy. At a minimum, orientation shall include four hours on the role of the home care aide; two hours on communication; two hours on understanding basic human needs; two hours on maintaining a healthy environment; two hours on infection control in the home; and one hour on emergency procedures. The individual shall have successfully passed an agency written test and demonstrated the ability to perform skills for the assigned tasks; or

(2) Be an individual who possesses a license to practice nursing as an LPN or RN in the state of Iowa.

b. Individuals who were hired under the requirements of Chapter 80 on or before May 16, 2018, are exempt from the criteria in paragraph 80.3(6) "a."

c. The authorized agency shall ensure that services or tasks assigned are appropriate to the individual's prior education and training.

d. The authorized agency shall ensure documentation of each home care aide's completion of at least 12 hours of annual in-service (prorated to employment).

e. The authorized agency shall establish policies for supervision of home care aides.

- f.* The authorized agency shall maintain records for each consumer. The records shall include:
- (1) An initial assessment;
 - (2) A plan of care;
 - (3) Assignment of home care aide;
 - (4) Assignment of tasks;
 - (5) Reassessment;
 - (6) An update of the plan of care;
 - (7) Home care aide documentation; and
 - (8) Documentation of supervision of home care aides.

[ARC 1925C, IAB 4/1/15, effective 7/1/15; ARC 3747C, IAB 4/11/18, effective 5/16/18]

641—80.4(135) Utilization of LPHS contract funding. The contractor may bill public health activities to the LPHS contract based on the identified needs of the community.

80.4(1) Planning process. Annually, the contractor shall initiate a planning process with input from authorized agencies in order for the contractor to identify the utilization of LPHS contract funding.

80.4(2) Funder of last resort. The LPHS contract shall be billed as the funder of last resort.

- a.* The LPHS contract shall be billed at the authorized agency's cost or charge, whichever is less.
- b.* The LPHS contract shall not be billed for services eligible for third-party reimbursement (e.g., Medicare, Medicaid, private insurance, approved Iowa waivers, or other federal or state funds).
- c.* The LPHS contract shall not be billed for the balance between the authorized agency cost or charge, whichever is less, and the allowed reimbursement from a third-party payer.
- d.* The LPHS contract shall not be billed for fees waived by the authorized agency.
- e.* The LPHS contract shall not be billed for services provided in a previous fiscal year.

80.4(3) Cost analysis. The authorized agency shall complete, at a minimum, an annual cost report for each approved LPHS contract activity using a method approved by the department. The authorized agency shall maintain documentation to support each cost report. Expenses to be included in an annual cost report must be documented by the agency as received before the expenses can be included in the cost report.

80.4(4) Fees and donations.

- a.* Authorized agencies shall use fees billed and donations received from consumers to support the activities billed to the LPHS contract.
- b.* Fees for services provided shall be based on a financial assessment which determines the consumer's financial responsibility.
- c.* Fees for services may be established by the authorized agency except for services described in subparagraph 80.4(4) "f"(6).
- d.* Donations shall be accepted.
- e.* A financial assessment that considers financial resources and income and determines the consumer's financial responsibility shall be completed for nursing (skilled and health maintenance) activities and all home care aide activities.
 - (1) The financial assessment shall be updated annually by the authorized agency.
 - (2) An authorized agency may consider additional health care-related expenses or financial resources above \$10,000 when determining the consumer's fee according to an agency's policy.
 - (3) Restricted assets shall not be considered as a resource in the determination of a consumer's financial responsibility for services.
 - (4) Unrestricted assets shall be considered in the determination of a consumer's financial responsibility for services in the sliding fee calculation.
- f.* Sliding fee scale. The following instructions apply to the use of the sliding fee scale.
 - (1) The authorized agency shall establish a sliding fee scale for all home care aide activities and nursing (skilled and health maintenance) activities.
 - (2) The sliding fee scale shall be based on the authorized agency's charge for services.
 - (3) The authorized agency shall determine the amount the consumer will pay according to the sliding fee scale prior to providing the service.

(4) A fee shall be charged to consumers who have an income at or above 200 percent of the most recent federal poverty guidelines.

(5) No fee shall be charged to consumers who have an income at or below 75 percent of the most recent federal poverty guidelines and have financial resources of \$10,000 or less.

(6) No fee shall be charged for communicable disease follow-up services.

(7) An authorized agency may charge a fee according to the authorized agency's policy for services other than those described in subparagraphs 80.4(4) "f"(1) to (6).

80.4(5) *Alternative plan.* A request and written plan is required for the use of the LPHS contract funds for any activity that is not one of the current activities identified in the contract documents. The request and plan shall be based on an assessment of the needs of the community and shall be submitted by the contractor to the department for approval. The plan shall:

- a. Identify essential public health services to be delivered;
- b. Describe the activity to be delivered;
- c. Identify target populations to be served; and
- d. Describe the anticipated impact due to the use of an alternative plan.

80.4(6) *Reallocation.* The department will annually determine the potential for unused funds from contracts. If funds are available, reallocation of the funds shall be at the discretion of the department. [ARC 1925C, IAB 4/1/15, effective 7/1/15; ARC 3747C, IAB 4/11/18, effective 5/16/18]

641—80.5(135) Right to appeal.

80.5(1) *Denial, reduction or termination of services.*

a. When an authorized agency denies, reduces or terminates services funded by the LPHS contract against the wishes of a consumer, the authorized agency shall notify the consumer of the following:

- (1) The action taken;
- (2) The reason for the action; and
- (3) The consumer's right to appeal.

b. If a consumer files an appeal, the authorized agency shall provide services to the consumer throughout the appeals process, unless the agency receives a waiver from the department pending the outcome of the appeal.

80.5(2) *Local appeals process.*

a. The authorized agency shall have a written procedure through which consumers funded by the LPHS contract may appeal to the contractor. The written procedure shall, at a minimum, include:

- (1) The method of notification of the right to appeal;
- (2) The procedure for conducting the appeal;
- (3) Time limits for each step;
- (4) Notification of the consumer's right to appeal to the contractor; and
- (5) Notification of the outcome of the appeal. The notification shall include the facts used to reach the decision and the conclusions drawn from the facts to support the decision of the authorized agency.

b. The written appeals procedure and the record of appeals filed (including the record and disposition of each) shall be available for inspection by authorized representatives of the department.

80.5(3) *Appeal to department.*

a. If a consumer is dissatisfied with the decision of the local appeal, the consumer may appeal to the Iowa department of public health within 15 days of the receipt of the local contractor's appeal decision. The appeal shall be made in writing and sent by certified mail, return receipt requested, to the Division Director, Division of Health Promotion and Chronic Disease Prevention, Iowa Department of Public Health, Lucas State Office Building, Des Moines, Iowa 50319-0075.

b. Department review. The department shall evaluate the appeal based upon the merits of the local appeal documentation. A department decision affirming, reserving, or modifying the local appeal decision shall be issued within 30 days of the receipt of all local appeal documentation. The department

decision shall be in writing and sent by certified mail, return receipt requested, to the consumer, the contractor, and the authorized agency.

80.5(4) *Further appeal.* The consumer may appeal the department's decision within 10 days of the receipt of the department's decision. The appeal shall be made in writing and sent to the Director, Iowa Department of Public Health, Lucas State Office Building, Des Moines, Iowa 50319-0075. Upon receipt of an appeal that meets contested case status, the department shall forward the appeal within 5 working days to the department of inspections and appeals pursuant to the rules adopted by the department of inspections and appeals regarding the transmission of contested cases. The continued process for appeals shall be governed by 641—Chapter 173, Iowa Administrative Code.

[ARC 1925C, IAB 4/1/15, effective 7/1/15; ARC 3747C, IAB 4/11/18, effective 5/16/18]

641—80.6(135) Essential public health service funds.

80.6(1) *Purpose.* The purposes of essential public health service funds are to provide essential public health services that reduce risks and to invest in promoting and protecting good health over the course of a lifetime with a priority given to older Iowans and vulnerable populations.

80.6(2) *Allocation for essential public health service funds.* The appropriation to each county board of health is determined by the following formula:

a. Eighteen percent of the total allocation shall be divided so that an equal amount is available for use in each county in the state.

b. Eight percent of the total allocation shall be allocated to each county according to the county's population based upon the published data by the U.S. Census Bureau, which is the data available three months prior to the release of the LPHS application.

c. Forty-four percent of the total allocation shall be allocated according to the proportion of state residents who are elderly persons living in the county based upon the bridged-race population estimates produced by the U.S. Census Bureau in collaboration with the National Center for Health Statistics (NCHS).

d. Thirty percent of the total allocation shall be allocated according to the proportion of state residents who are low-income persons living in the county based upon the U.S. Census Bureau's small area income and poverty estimates (SAIPE).

[ARC 1925C, IAB 4/1/15, effective 7/1/15; ARC 3747C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code subsection 135.11(13).

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[Filed ARC 3747C (Notice ARC 3577C, IAB 1/17/18), IAB 4/11/18, effective 5/16/18]

CHAPTER 146
STROKE CARE REPORTING

641—146.1(135) Purpose. The purpose of this chapter is to identify the statewide stroke database where nationally certified comprehensive stroke centers and nationally certified primary stroke centers in the state are required to report stroke care data in accordance with Iowa Code chapter 135.

[ARC 3748C, IAB 4/11/18, effective 5/16/18]

641—146.2(135) Definitions.

“*Comprehensive stroke center*” means a hospital certified as a comprehensive stroke center by a nationally recognized certifying body with certification criteria consistent with the most current nationally recognized, evidence-based stroke guidelines related to reducing the occurrence of and disabilities and death associated with stroke.

“*Department*” means the Iowa department of public health.

“*Primary stroke center*” means a hospital certified as a primary stroke center by a nationally recognized certifying body with certification criteria consistent with the most current nationally recognized, evidence-based stroke guidelines related to reducing the occurrence of and disabilities and death associated with stroke.

“*Stroke*” means a clinical diagnosis of acute stroke or principal International Classification of Disease, 10th Revision, Clinical Modification (ICD-10-CM) discharge code of “stroke,” or “transient ischemic attack,” or “cerebral infarction,” or “cerebral hemorrhage.”

“*Stroke care*” means care provided to individuals with confirmed cases of stroke.

[ARC 3748C, IAB 4/11/18, effective 5/16/18]

641—146.3(135) Stroke care reporting.

146.3(1) Iowa statewide stroke database. The department designates the Get with the Guidelines stroke module of the American Heart Association/American Stroke Association as the Iowa stroke database established in Iowa Code section 135.191.

146.3(2) Who is required to report. All nationally certified comprehensive stroke centers and all nationally certified primary stroke centers operating in the state of Iowa are required to report stroke data. Nationally certified acute stroke-ready hospitals and emergency medical services operating in the state of Iowa are encouraged to report stroke care data.

146.3(3) What is required to be reported. Reportable data of stroke care are required to be reported. Reportable data are those data identified by a clinical diagnosis of acute stroke or by the following ICD-10 coding:

| ICD-10-CM Code | Short Description |
|-------------------|---|
| I60.00 - I60.9 | Nontraumatic subarachnoid hemorrhage |
| I61.0 - I61.9 | Nontraumatic intracerebral hemorrhage |
| I63.00 - I63.9 | Cerebral infarction (occlusion and stenosis of cerebral and precerebral arteries, resulting in cerebral infarction) |
| G45.0 - G45.2 | TIA and related syndromes |
| G45.8 - G45.9 | TIA and related syndromes |
| O99.411 - O99.43 | Diseases of the circulatory system complicating pregnancy, childbirth and puerperium |
| G97.31 - G97.32 | Intraoperative hemorrhage and hematoma of a nervous system organ or structure complicating a procedure |
| G97.51 - G97.52 | Postprocedural hemorrhage and hematoma of a nervous system organ or structure following a procedure |
| I97.810 - I97.821 | Intraoperative and postoperative cerebrovascular infarction |

[ARC 3748C, IAB 4/11/18, effective 5/16/18]

641—146.4(135) Method and frequency of reporting.

146.4(1) Stroke centers shall report the required stroke care information for any reportable stroke case no later than 120 days after the patient was discharged, transferred to another hospital, or pronounced dead.

146.4(2) Reports shall meet the data quality, format, and timeliness standards prescribed by the Iowa statewide stroke database.

[ARC 3748C, IAB 4/11/18, effective 5/16/18]

641—146.5(135) Confidentiality. The Iowa statewide stroke database shall comply with federal and state law and other health information and data collection, storage, and sharing requirements of the department.

[ARC 3748C, IAB 4/11/18, effective 5/16/18]

641—146.6(135) Penalties and enforcement. If a stroke center required to report under this chapter does not comply with the reporting requirements, the department may request a review of the certification of the comprehensive stroke center or the primary stroke center by the certifying entity.

[ARC 3748C, IAB 4/11/18, effective 5/16/18]

These rules are intended to implement Iowa Code section 135.191.

[Filed ARC 3748C (Notice ARC 3575C, IAB 1/17/18), IAB 4/11/18, effective 5/16/18]

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PROFESSIONAL LICENSURE DIVISION[645]

Created within the Department of Public Health[641] by 1986 Iowa Acts, chapter 1245.
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CHAPTER 280
LICENSURE OF SOCIAL WORKERS

645—280.1(154C) Definitions. For purposes of these rules, the following definitions shall apply:

“*Active license*” means a license that is current and has not expired.

“*ASWB*” means the Association of Social Work Boards.

“*Board*” means the board of social work.

“*Grace period*” means the 30-day period following expiration of a license when the license is still considered to be active. In order to renew a license during the grace period, a licensee is required to pay a late fee.

“*Inactive license*” means a license that has expired because it was not renewed by the end of the grace period. The category of “inactive license” may include licenses formerly known as lapsed, inactive, delinquent, closed, or retired.

“*LBSW*” means licensed bachelor social worker.

“*Licensee*” means any person licensed to practice as a social worker in the state of Iowa.

“*License expiration date*” means December 31 of even-numbered years.

“*Licensure by endorsement*” means the issuance of an Iowa license to practice social work to an applicant who is or has been licensed in another state.

“*LISW*” means licensed independent social worker.

“*LMSW*” means licensed master social worker.

“*Mandatory training*” means training on identifying and reporting child abuse or dependent adult abuse required of social workers who are mandatory reporters. The full requirements on mandatory reporting of child abuse and the training requirements are found in Iowa Code section 232.69. The full requirements on mandatory reporting of dependent adult abuse and the training requirements are found in Iowa Code section 235B.16.

“*Reactivate*” or “*reactivation*” means the process as outlined in rule 645—280.14(17A,147,272C) by which an inactive license is restored to active status.

“*Reciprocal license*” means the issuance of an Iowa license to practice social work to an applicant who is currently licensed in another state and that state’s board of examiners has a mutual written agreement with the Iowa board of social work to license persons who have the same or similar qualifications to those required in Iowa.

“*Reinstatement*” means the process as outlined in 645—11.31(272C) by which a licensee who has had a license suspended or revoked or who has voluntarily surrendered a license may apply to have the license reinstated, with or without conditions. Once the license is reinstated, the licensee may apply for active status.

[ARC 8371B, IAB 12/16/09, effective 1/20/10; ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—280.2(154C) Social work services subject to regulation. Social work services provided to an individual in this state through telephonic, electronic or other means, regardless of the location of the social worker, shall constitute the practice of social work and shall be subject to regulation in Iowa.

645—280.3(154C) Requirements for licensure. The following criteria shall apply to licensure:

280.3(1) The applicant shall complete a board-approved application. Application forms may be obtained from the board’s website (www.idph.iowa.gov/licensure) or directly from the board office, or the applicant may complete the application online at ibplicense.iowa.gov. All paper applications shall be

sent to Board of Social Work, Professional Licensure Division, Fifth Floor, Lucas State Office Building, Des Moines, Iowa 50319-0075.

280.3(2) The applicant shall complete the application form according to the instructions contained in the application. If the application is not completed according to the instructions, the application will not be reviewed by the board.

280.3(3) Each application shall be accompanied by the appropriate fees payable by check or money order to the Board of Social Work. The fees are nonrefundable.

280.3(4) No application shall be considered by the board until official copies of academic transcripts have been received by the board except as provided in 280.4(6).

280.3(5) The applicant shall provide verification of license(s) from every state in which the applicant has been licensed as a social worker, sent directly from the state(s) to the Iowa board of social work office.

280.3(6) The candidate shall take the examination(s) required by the board pursuant to these rules.

280.3(7) An applicant for a license as an independent social worker shall have met the requirements for supervision pursuant to 645—280.6(154C).

280.3(8) Each social worker who seeks to attain licensure as an independent social worker shall have been granted a master's or doctoral degree in social work and practiced at that level.

280.3(9) Notification of licensure shall be sent to the licensee by regular mail.

280.3(10) Licensees who were issued their initial licenses within six months prior to the renewal shall not be required to renew their licenses until the renewal date two years later.

280.3(11) Incomplete applications that have been on file in the board office for more than two years shall be:

- a. Considered invalid and shall be destroyed; or
- b. Maintained upon written request of the candidate. The candidate is responsible for requesting that the file be maintained.

280.3(12) In lieu of the requirements in subrules 280.3(4) and 280.3(5), the board will accept the ASWB Social Work Registry verification of academic transcripts and verification of licensure in other states.

[ARC 8371B, IAB 12/16/09, effective 1/20/10; ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—280.4(154C) Written examination.

280.4(1) The applicant is required to take and pass the ASWB examination at the appropriate level as follows:

- a. Bachelor level social worker—the basic level examination.
- b. Master level social worker—the intermediate level examination.
- c. Independent level social worker—the clinical level examination.

280.4(2) The electronic examination shall be scheduled with ASWB.

280.4(3) Application for any required examination will be denied or deferred by the board if the applicant lacks the required education or practice experience.

280.4(4) The applicant and the board shall be notified of the ASWB examination results, and the applicant may receive the results at the time of the examination. The board will accept only official results from the ASWB examination service that are sent directly from the examination service to the board.

280.4(5) The ASWB passing score will be utilized as the Iowa passing score.

280.4(6) An applicant may sit for the examination if the applicant meets the requirements stated in 645—280.3(154C). Upon written request of the applicant, the board may authorize a student to sit for the examination prior to the receipt of the official transcript if the student is in the last semester of an approved master of social work program. The student shall submit an application for licensure at the master's level and the fee, and, in lieu of a transcript, the student shall request that the school submit a letter directly to the board office. The letter shall state that the student is currently enrolled in a master of social work program and the student's expected date of graduation. Upon completion of degree requirements, the applicant shall have the transcript showing the date of the degree sent directly

from the school to the board office at the Board of Social Work, Professional Licensure Division, Fifth Floor, Lucas State Office Building, Des Moines, Iowa 50319-0075.

280.4(7) In lieu of the requirements in subrule 280.4(4), the board will accept the ASWB Social Work Registry verification of the ASWB examination results.

[ARC 8371B, IAB 12/16/09, effective 1/20/10]

645—280.5(154C) Educational qualifications.

280.5(1) Bachelor level social worker. An applicant for a license as a bachelor level social worker shall present evidence satisfactory to the board that the applicant possesses a bachelor's degree in social work from a college or university accredited by the Council on Social Work Education at the time of graduation.

280.5(2) Master level social worker. An applicant for a license as a master level social worker shall present evidence satisfactory to the board that the applicant:

- a. Possesses a master's degree in social work from a college or university accredited by the Council on Social Work Education at the time of graduation; or
- b. Possesses a doctoral degree in social work from a college or university approved by the board at the time of graduation.

280.5(3) Independent level social worker. An applicant for a license as an independent level social worker shall present evidence satisfactory to the board that the applicant:

- a. Possesses a master's degree in social work from a college or university accredited by the Council on Social Work Education at the time of graduation; or
- b. Possesses a doctoral degree in social work from a college or university approved by the board at the time of graduation.

280.5(4) Foreign-trained social workers shall:

a. Provide an equivalency evaluation of their educational credentials by International Educational Research Foundations, Inc., Credentials Evaluation Service, P.O. Box 3665, Culver City, California 90231-3665, telephone (310)258-9451, website www.ierf.org or email at info@ierf.org; or obtain a certificate of equivalency from the Council on Social Work Education, 1701 Duke Street, Suite 200, Alexandria, Virginia 22314-3457, telephone (703)683-8080, website www.cswe.org. The professional curriculum must be equivalent to that stated in these rules. The candidate shall bear the expense of the curriculum evaluation.

b. Provide a notarized copy of the certificate or diploma awarded to the applicant from a social work program in the country in which the applicant was educated.

c. Receive a final determination from the board regarding the application for licensure.

[ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—280.6(154C) Period of supervised professional practice for LISW. To qualify for licensure at the independent level, an LMSW shall complete a period of supervised professional practice in accordance with the requirements of this rule.

280.6(1) *Minimum requirements.* The period of supervised professional practice shall:

- a. Not begin prior to licensure at the master's level.
- b. Have a duration of at least two calendar years.
- c. Consist of a minimum of 4,000 hours of social work practice at the master's level.
- d. Include at least 110 hours of direct supervision equitably distributed throughout the period and in compliance with the requirements of subrule 280.6(3).
- e. Be done pursuant to one or more written supervision plans that comply with the requirements of subrule 280.6(7).

280.6(2) *Content of supervised professional practice.* The supervisor shall ensure that the period of supervised professional practice includes the following:

- a. Psychosocial assessments, including evaluation of symptoms and behaviors and the effects of the environment on behavior;
- b. Diagnostic practice using the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) of the American Psychiatric Association;

- c. Treatment, including the establishment of treatment goals, psychosocial therapy, and differential treatment planning;
- d. Practice management skills;
- e. Skills required for continued competence;
- f. Training on ethical standards and legal and regulatory requirements; and
- g. Development of professional identity.

280.6(3) *Direct supervision.* The required 110 hours of direct supervision may be obtained through individual meetings between the supervisor and supervisee or through group supervision meetings consisting of the supervisor and more than one supervisee.

a. The first supervision meeting must occur in person. After the first supervision meeting, the remaining supervision may occur through in-person meetings or through electronic meetings using an interactive real-time system that provides for visual and audio interaction between the supervisor and supervisee.

b. A maximum of 60 hours of direct supervision may be obtained through group supervision meetings. A maximum of six supervisees may participate in any group supervision meeting.

280.6(4) *Supervisor eligibility requirements.*

a. To be eligible to serve as a supervisor for the period of supervised professional practice, a social worker shall:

(1) Hold an active license to practice social work at the independent level in Iowa. If the supervised professional practice occurs in another state, a social worker licensed in that state may serve as a supervisor if the social worker is licensed at a level equivalent to the independent level. A social worker licensed in another state may provide direct supervision hours if the social worker is licensed at a level equivalent to the independent level.

(2) Have at least three years of social work practice at the independent level, which must include a minimum of 4,000 hours of practice.

(3) Complete a six-hour continuing education course pertaining to social work practice supervision or one master's level course in supervision.

b. Any request for a supervisor who does not meet these requirements must be submitted to the board for approval before supervision begins. The board will only approve an otherwise ineligible supervisor if the supervisee demonstrates that eligible supervisors are unavailable or unwilling to provide supervision. Any practice or supervision hours obtained under an ineligible supervisor prior to board approval cannot be counted toward completion of the period of supervised professional practice.

280.6(5) *Supervisor responsibilities.* A supervisor shall provide adequate supervision to all supervisees. Failure to provide adequate supervision may be grounds for disciplinary action. A supervisor shall be responsible for:

- a. Timely submission of the supervision plan;
- b. Providing supervision in accordance with this rule;
- c. Directing the supervisee to obtain written releases of information from patients when legally required for purposes of providing supervision;
- d. Providing periodic evaluations and feedback regarding the supervisee's performance to the supervisee;
- e. Answering questions and assisting supervisees as new or difficult issues arise;
- f. Ensuring the supervisee's caseload is manageable;
- g. Reporting to the board any violations of board rules by supervisees; and
- h. Completing a supervision report.

280.6(6) *Supervisee responsibilities.* A supervisee shall comply with all statutes and rules governing the practice of social work. A supervisee shall be responsible for:

- a. Timely submission of the supervision plan;
- b. Obtaining supervision in accordance with this rule;
- c. Obtaining written releases of information from patients when legally required for purposes of receiving supervision;

- d. Asking the supervisor to provide periodic evaluations and feedback regarding the supervisee's performance;
- e. Asking questions of the supervisor when assistance is needed or when new or difficult issues arise;
- f. Reporting any issues related to caseload, including volume and difficulty, to the supervisor;
- g. Reporting to the board any violations of board rules by the supervisor; and
- h. Maintaining a copy of every supervision plan and supervision report until such time as the supervisee is issued a license to practice social work at the independent level.

280.6(7) Supervision plan. A current written supervision plan must be maintained throughout the period of supervised professional practice. Each supervisor who provides practice supervision or direct supervision hours shall be named on a supervision plan.

a. A written supervision plan must be established and submitted to the board before the period of supervised professional practice begins. The board will perform an initial review of each supervision plan and notify the supervisee of approval or denial of the plan within 45 days of receipt. A supervisee may begin supervised professional practice after submission of the supervision plan but cannot count any practice or supervision hours obtained pursuant to a supervision plan that is ultimately denied by the board.

b. If a supervisee is changing supervisors or adding an additional supervisor, a revised supervision plan shall be submitted to the board for approval at the time of the change or addition. A supervisee may continue supervised professional practice after submission of a revised supervision plan but cannot count any practice or supervision hours obtained pursuant to a revised supervision plan that is ultimately denied by the board.

c. The board maintains a supervision plan form that may be utilized to write the supervision plan. A supervision plan shall include:

- (1) The name, license number, date of licensure, address, telephone number, and email address of the supervisor;
- (2) The name, license number, address, telephone number, and email address of the supervisee;
- (3) The name of the agency, institution, or organization providing the period of supervised professional practice;
- (4) The start date and estimated date of completion of the period of supervised professional practice;
- (5) The goals and objectives for the period of supervised professional practice;
- (6) The nature, duration, and frequency of direct supervision, including the number of hours of direct supervision per week, the schedule for in-person and electronic supervision meetings, and the use of group supervision; and
- (7) The signatures of the supervisor and supervisee, and the dates of the signatures.

280.6(8) Completion of supervised professional practice.

a. At the conclusion of the period of supervised professional practice, the supervisee shall have any and all supervisors complete a supervision report on the form provided by the board. Each supervision report must be signed and dated by the supervisor and supervisee.

b. The board will review each supervision report for approval of the hours pertaining to the particular report. The board may deny any practice or supervision hours that were not obtained in compliance with this rule. The board may deny any practice or supervision hours if the supervisor indicates that the supervisee did not adhere to the ethical standards and legal and regulatory requirements governing the practice of social work or if the supervisor does not recommend the supervisee for licensure at the independent level.

[ARC 8371B, IAB 12/16/09, effective 1/20/10; ARC 8586B, IAB 3/10/10, effective 4/14/10; ARC 0093C, IAB 4/18/12, effective 5/23/12; ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—280.7(154C) Licensure by endorsement. An applicant who has been a licensed social worker under the laws of another jurisdiction shall file an application for licensure by endorsement with the board office. The board may receive by endorsement any applicant from the District of Columbia, another state, territory, province or foreign country who:

1. Submits to the board a completed application;
2. Pays the licensure fee;
3. Shows evidence of licensure requirements that are similar to those required in Iowa;
4. Provides official copies of the academic transcripts;
5. Provides official copies of the appropriate or higher level examination score sent directly from the ASWB; and
6. Provides verification of license(s) from every jurisdiction in which the applicant has been licensed, sent directly from the jurisdiction(s) to the board office. Web-based verification may be substituted for verification direct from the jurisdiction's board office if the verification provides:
 - Licensee's name;
 - Date of initial licensure;
 - Current licensure status; and
 - Any disciplinary action taken against the license.

In lieu of the requirements in numbered paragraphs "4," "5," and "6" of this rule, the board will accept the ASWB Social Work Registry verification of academic transcripts, examination scores, and licensure in other states.

[ARC 0093C, IAB 4/18/12, effective 5/23/12]

645—280.8(154C) Licensure by reciprocal agreement. Rescinded IAB 3/10/10, effective 4/14/10.

645—280.9(154C) License renewal.

280.9(1) The biennial license renewal period for a license to practice social work shall begin on January 1 of odd-numbered years and end on December 31 of the next even-numbered year. Every licensee shall renew on a biennial basis. The licensee is responsible for renewing the license prior to its expiration. Failure of the licensee to receive notice does not relieve the licensee of the responsibility for renewing the license.

280.9(2) Renewal procedures.

a. A licensee seeking renewal shall:

(1) Meet the continuing education requirements of rule 645—281.2(154C,272C) and the mandatory reporting requirements of subrule 280.9(3). A licensee whose license was reactivated during the current renewal compliance period may use continuing education credit earned during the compliance period for the first renewal following reactivation; and

(2) Submit the completed renewal application and renewal fee before the license expiration date.

b. An individual who was issued a license within six months of the license renewal date will not be required to renew the license until the next renewal two years later.

c. Those persons licensed for the first time shall not be required to complete continuing education as a prerequisite for the first renewal of their licenses. Continuing education hours acquired anytime from the initial licensing until the second license renewal may be used. The new licensee will be required to complete a minimum of 27 hours of continuing education per biennium for each subsequent license renewal.

d. Persons licensed to practice social work shall keep their renewal licenses displayed in a conspicuous public place at the primary site of practice.

e. Failure to receive the notice of renewal shall not relieve the licensee of the responsibility for submitting the required materials and the renewal fee to the board office 30 days before license expiration.

f. A social worker whose Iowa license is inactive, delinquent, closed, retired, voluntarily surrendered, suspended, or revoked cannot advance to a higher level until the license is again active.

280.9(3) Mandatory reporting of child abuse and dependent adult abuse.

a. A licensee who regularly examines, attends, counsels or treats children in Iowa shall indicate on the renewal application completion of two hours of training in child abuse identification and reporting in the previous five years or condition(s) for waiver of this requirement as identified in paragraph "f."

b. A licensee who regularly examines, attends, counsels or treats dependent adults in Iowa shall indicate on the renewal application completion of two hours of training in dependent adult abuse

identification and reporting in the previous five years or condition(s) for waiver of this requirement as identified in paragraph “f.”

c. A licensee who regularly examines, attends, counsels or treats both dependent adults and children in Iowa shall indicate on the renewal application completion of training in abuse identification and reporting in dependent adults and children or condition(s) for waiver of this requirement as identified in paragraph “f.”

d. Training may be completed through separate courses as identified in paragraphs “a” and “b” or in one combined two-hour course that includes curricula for identifying and reporting child abuse and dependent adult abuse.

e. The licensee shall maintain written documentation for five years after mandatory training as identified in paragraphs “a” to “c,” including program date(s), content, duration, and proof of participation.

f. The requirement for mandatory training for identifying and reporting child and dependent adult abuse shall be suspended if the board determines that suspension is in the public interest or that a person at the time of license renewal:

(1) Is engaged in active duty in the military service of this state or the United States.

(2) Holds a current waiver by the board based on evidence of significant hardship in complying with training requirements, including waiver of continuing education requirements or extension of time in which to fulfill requirements due to a physical or mental disability or illness as identified in 645—Chapter 281.

g. The board may select licensees for audit of compliance with the requirements in paragraphs “a” to “e.”

280.9(4) Late renewal. To renew a late license, the licensee shall complete the renewal requirements and submit the late fee within the grace period.

280.9(5) Inactive license. A licensee who fails to renew the license by the end of the grace period has an inactive license. A licensee whose license is inactive continues to hold the privilege of licensure in Iowa, but may not practice as a social worker in Iowa until the license is reactivated. A licensee who practices as a social worker in the state of Iowa with an inactive license may be subject to disciplinary action by the board, injunctive action pursuant to Iowa Code section 147.83, criminal sanctions pursuant to Iowa Code section 147.86, and other available legal remedies.

280.9(6) Upon receiving the information required by this rule and the required fee, board staff shall administratively issue a two-year license and shall send the licensee a wallet card by regular mail. In the event the board receives adverse information on the renewal application, the board shall issue the renewal license but may refer the adverse information for further consideration or disciplinary investigation.

[ARC 8371B, IAB 12/16/09, effective 1/20/10; ARC 9934B, IAB 12/28/11, effective 2/1/12; ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—280.10(272C) Exemptions for inactive practitioners. Rescinded IAB 8/31/05, effective 10/5/05.

645—280.11(272C) Lapsed licenses. Rescinded IAB 8/31/05, effective 10/5/05.

645—280.12(272C) Duplicate certificate or wallet card. Rescinded IAB 3/10/10, effective 4/14/10.

645—280.13(17A,147,272C) License denial. Rescinded IAB 3/10/10, effective 4/14/10.

645—280.14(17A,147,272C) License reactivation. To apply for reactivation of an inactive license, a licensee shall:

280.14(1) Submit a reactivation application on a form provided by the board.

280.14(2) Pay the reactivation fee that is due as specified in 645—Chapter 284.

280.14(3) Provide verification of current competence to practice social work by satisfying one of the following criteria:

a. If the license has been on inactive status for five years or less, an applicant must provide the following:

(1) Verification of the license(s) from every jurisdiction in which the applicant is or has been licensed and is or has been practicing during the time period the Iowa license was inactive, sent directly from the jurisdiction(s) to the board office. Web-based verification may be substituted for verification from a jurisdiction's board office if the verification includes:

1. Licensee's name;
2. Date of initial licensure;
3. Current licensure status; and
4. Any disciplinary action taken against the license; and

(2) Verification of completion of 27 hours of continuing education within two years of application for reactivation.

b. If the license has been on inactive status for more than five years, an applicant must provide the verifications in both subparagraphs (1) and (2) below plus the verification in either subparagraphs (3) or (4) below.

(1) Verification of the license(s) from every jurisdiction in which the applicant is or has been licensed and is or has been practicing during the time period the Iowa license was inactive, sent directly from the jurisdiction(s) to the board office. Web-based verification may be substituted for verification from a jurisdiction's board office if the verification includes:

1. Licensee's name;
2. Date of initial licensure;
3. Current licensure status; and
4. Any disciplinary action taken against the license; and

(2) Verification of completion of 27 hours of continuing education within two years of application for reactivation; and

(3) Verification of passing the ASWB examination within the last five years at the appropriate or higher level as follows:

1. Bachelor level social worker – the bachelor's level examination; or
2. Master level social worker – the master's level examination; or
3. Independent level social worker – the clinical level examination; or

(4) Verification of continued social work practice at the appropriate or higher level in another state for a minimum of two years immediately preceding the application for reactivation.

[ARC 0093C, IAB 4/18/12, effective 5/23/12]

645—280.15(17A,147,272C) License reinstatement. A licensee whose license has been revoked, suspended, or voluntarily surrendered must apply for and receive reinstatement of the license in accordance with 645—11.31(272C) and must apply for and be granted reactivation of the license in accordance with 645—280.14(17A,147,272C) prior to practicing social work in this state.

These rules are intended to implement Iowa Code chapters 17A, 147, 154C and 272C.

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[Filed ARC 8587B (Notice ARC 8368B, IAB 12/16/09), IAB 3/10/10, effective 4/14/10]

[Filed ARC 9934B (Notice ARC 9750B, IAB 9/21/11), IAB 12/28/11, effective 2/1/12]

[Filed ARC 0093C (Notice ARC 9946B, IAB 12/28/11), IAB 4/18/12, effective 5/23/12]

[Filed ARC 3744C (Notice ARC 3433C, IAB 11/8/17), IAB 4/11/18, effective 5/16/18]

[◊] Two or more ARCs

¹ Effective date of rules 161.212 to 161.217 delayed 70 days by the Administrative Rules Review Committee.

² Effective date of 280.100(154C) is July 1, 1993.

³ Effective date of **ARC 9102A** delayed 70 days by the Administrative Rules Review Committee at its meeting held July 13, 1999; delay lifted at the meeting held August 3, 1999, effective August 4, 1999.

CHAPTER 281
CONTINUING EDUCATION FOR SOCIAL WORKERS

645—281.1(154C) Definitions. For the purpose of these rules, the following definitions shall apply:

“*Active license*” means a license that is current and has not expired.

“*Approved program/activity*” means a continuing education program/activity meeting the standards set forth in these rules.

“*Audit*” means the selection of licensees for verification of satisfactory completion of continuing education requirements during a specified time period.

“*Board*” means the board of social work.

“*Continuing education*” means planned, organized learning acts acquired during licensure designed to maintain, improve, or expand a licensee’s knowledge and skills in order for the licensee to develop new knowledge and skills relevant to the enhancement of practice, education, or theory development to improve the safety and welfare of the public.

“*Hour of continuing education*” means at least 50 minutes spent by a licensee in actual attendance at and completion of an approved continuing education activity.

“*Inactive license*” means a license that has expired because it was not renewed by the end of the grace period. The category of “inactive license” may include licenses formerly known as lapsed, inactive, delinquent, closed, or retired.

“*Independent study*” means a subject/program/activity that a person pursues autonomously that meets standards for approval criteria in the rules and includes a posttest.

“*License*” means license to practice.

“*Licensee*” means any person licensed to practice as a social worker in the state of Iowa.

[ARC 8371B, IAB 12/16/09, effective 1/20/10]

645—281.2(154C) Continuing education requirements.

281.2(1) The biennial continuing education compliance period shall extend for a two-year period beginning on January 1 of each odd-numbered year and ending on December 31 of the next even-numbered year. Each biennium, each person who is licensed to practice as a licensee in this state shall be required to complete a minimum of 27 hours of continuing education approved by the board.

281.2(2) Requirements of new licensees. Those persons licensed for the first time during the license renewal period shall not be required to complete continuing education as a prerequisite for the first renewal of their licenses. Continuing education hours acquired anytime from the initial licensing until the second renewal may be used. The new licensee will be required to complete a minimum of 27 hours of continuing education per biennium for each subsequent license renewal.

281.2(3) Requirement of supervisors. For licensure at the independent level, persons serving in a supervisory role must complete 3 hours of continuing education in supervision.

281.2(4) Hours of continuing education credit may be obtained by attending and participating in a continuing education activity. These hours must be in accordance with these rules.

281.2(5) No hours of continuing education shall be carried over into the next biennium except as stated for the second renewal. A licensee whose license was reactivated during the current renewal compliance period may use continuing education earned during the compliance period for the first renewal following reactivation.

281.2(6) It is the responsibility of each licensee to finance the cost of continuing education.

281.2(7) The licensee shall maintain a personal file with all documentation of the continuing education credits obtained.

[ARC 0093C, IAB 4/18/12, effective 5/23/12; ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—281.3(154C,272C) Standards.

281.3(1) General criteria. A continuing education activity which meets all of the following criteria is appropriate for continuing education credit if the continuing education activity:

a. Constitutes an organized program of learning which contributes directly to the professional competency of the licensee;

b. Pertains to subject matters which integrally relate to the practice of the profession;
 c. Is conducted by individuals who have specialized education, training and experience by reason of which said individuals should be considered qualified concerning the subject matter of the program. At the time of audit, the board may request the qualifications of presenters.

d. Fulfills stated program goals, objectives, or both;
 e. Provides proof of attendance to licensees in attendance including:
 (1) Date, location, course title, presenter(s);
 (2) Number of program contact hours; and
 (3) Certificate of completion or evidence of successful completion of the course provided by the course sponsor; and

f. Contains one of the following content areas:
 (1) Human behavior.
 1. Theories and concepts of the development of human behavior in the life cycle of individuals, families and the social environment;
 2. Community and organizational theories;
 3. Normal, abnormal and addictive behaviors;
 4. Abuse and neglect; and
 5. Effects of culture, race, ethnicity, sexual orientation and gender.
 (2) Assessment and treatment.
 1. Psychosocial assessment/interview;
 2. Utilization of the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) of the American Psychiatric Association;
 3. Theoretical approaches and models of practice—individual, couple, and family therapy and group psychotherapy;
 4. Establishing treatment goals and monitoring progress;
 5. Techniques of social work practice; and
 6. Interdisciplinary consultation and collaboration.
 (3) Social work research, program evaluation, or practice evaluation.
 (4) Management, administration, and social policy.
 1. Organizational policies and procedures;
 2. Advocacy and prevention in social work practice;
 3. Management of social work staff and other personnel; and
 4. Management of social work programs.
 (5) Theories and concepts of social work education.
 (6) Social work ethics as they pertain to the rules of conduct.
 (7) An area, as demonstrated by the licensee, that directly relates to the licensee's individual practice as a social worker. The licensee shall submit for consideration by the board a specific explanation of how the program relates to the licensee's individual practice setting as a social worker.

281.3(2) Specific criteria. Continuing education hours of credit can be obtained by completing:
 a. A minimum of three hours per biennium in social work ethics.
 b. A maximum of 12 hours per biennium for independent study courses.
 c. Academic coursework that meets the criteria set forth in the rules. Continuing education equivalents are as follows:

1 academic semester hour = 15 continuing education hours

1 academic quarter hour = 10 continuing education hours

d. Self-study courses that have a mentor and prior approval as defined in the rules and are accompanied by a brief paper authored by the licensee demonstrating application of the learning objectives to practice issues.

e. Programs designed for the purpose of enhancing the licensee's administrative, management or other clinical skills.

f. Activities/programs that are sponsored/approved by:

(1) ASWB Approved Continuing Education (ACE) Program; or

(2) National Association of Social Workers (NASW) Continuing Education Unit (CEU) Approval Program.

g. Pro-bono/volunteer work that meets the following criteria:

(1) A licensee may earn a maximum of 3 of the required 27 hours of continuing education for credit during one biennium by performing pro-bono/volunteer services for indigent, underserved populations, or in areas of critical need within the state of Iowa. Such services must be approved in advance by the board.

(2) A licensee shall make application for prior approval of pro-bono/volunteer services by sending a letter to the board indicating that the following requirements will be met:

1. The site for these services is identified including information about the clients, the services that will be offered, how they will be performed and the learning objectives.

2. A contract will be established between licensee and client(s), and each party will be aware that the services are being provided without charge.

3. The services will be subject to all the legal responsibilities and obligations related to the licensee's profession.

4. The licensee will keep records and files of these client services pursuant to the rules of 645—Chapter 282.

5. A representative from the site for pro-bono/volunteer services must provide a letter stating that these services are to be performed by the licensee.

6. Upon review, the licensee will receive a letter from the board indicating prior approval for these pro-bono/volunteer services that will be done for continuing education credit.

7. Following completion of such services:

- The licensee must provide the board a letter stating that the services were performed as planned.
- The representative on the site must provide a letter indicating such completion.

h. Instruction of a course at an approved college, university or graduate school of social work. A licensee may receive credit on a one-time basis not to exceed three hours of continuing education credit per biennium.

i. Instruction/presentation/moderation of continuing education programs. A licensee may receive credit on a one-time basis, not to exceed three hours of continuing education credit per biennium, for programs at which the licensee is actually in attendance for the complete program provided the licensee receives a certificate of attendance in compliance with this rule.

j. Authorship of papers, publications or books and preparation of presentations and exhibits. A presentation must be made before a professional audience. Presentations may receive credit on a one-time basis for the article, publication, book or the preparation of a presentation or exhibit, not to exceed three hours of continuing education credit per biennium.

k. Supervision of a social work practicum student(s) from an accredited social work education program. A licensee may receive one credit for every 100 hours supervised, not to exceed six hours of continuing education credit per biennium.

[ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—281.4(154C,272C) Audit of continuing education report. Rescinded IAB 3/10/10, effective 4/14/10.

645—281.5(154C,272C) Automatic exemption. Rescinded IAB 3/10/10, effective 4/14/10.

645—281.6(154C,272C) Continuing education exemption for disability or illness. Rescinded IAB 3/10/10, effective 4/14/10.

645—281.7(154C,272C) Grounds for disciplinary action. Rescinded IAB 3/10/10, effective 4/14/10.

645—281.8(154C,272C) Continuing education exemption for inactive practitioners. Rescinded IAB 8/31/05, effective 10/5/05.

645—281.9(154C,272C) Continuing education waiver for disability or illness. Rescinded IAB 8/31/05, effective 10/5/05.

645—281.10(154C,272C) Reinstatement of inactive practitioners. Rescinded IAB 8/31/05, effective 10/5/05.

645—281.11(272C) Hearings. Rescinded IAB 8/31/05, effective 10/5/05.

These rules are intended to implement Iowa Code section 272C.2 and chapter 154C.

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[◇] Two or more ARCs

¹ Effective date of 281.3(1) delayed 70 days by the Administrative Rules Review Committee at its meeting held February 9, 2001.

CHAPTER 282
PRACTICE OF SOCIAL WORKERS

645—282.1(154C) Definitions.

“*Client*” means the individual, couple, family, or group to whom a licensee provides direct social work services.

“*Clinical services*” means services provided by an LMSW or LISW which involve the professional application of social work theory and methods in diagnosing, assessing, treating, and preventing psychosocial disabilities or impairments, including emotional and mental disorders.

“*Counseling*” means a method used by licensees to assist clients in learning how to solve problems and make decisions about personal, health, social, educational, vocational, financial, and other interpersonal concerns.

“*Psychosocial therapy*” means a specialized, formal interaction between an LMSW or LISW and a client in which a therapeutic relationship is established and maintained to assist the client in overcoming or abating specific emotional, mental, or social problems and achieving specified goals for well-being. Psychosocial therapy is a form of psychotherapy which emphasizes the interface between the client and the client’s environment. Therapy is a planned, structured program based on a diagnosis and is directed to accomplish measurable goals and objectives specified in the client’s individual treatment plan.

645—282.2(154C) Rules of conduct.**282.2(1) Informed consent.**

a. A licensee shall provide services to clients only in the context of a professional relationship based, when appropriate, on valid written informed consent. A licensee shall use clear and understandable language to inform clients about the nature of available services, potential benefits and risks, limits and risks of confidentiality, alternative ways of receiving assistance, applicable fees, and involvement of and sharing information with third parties.

b. If a client has difficulty communicating, a licensee shall attempt to ensure the client’s comprehension. This may include providing the client with a detailed verbal explanation or arranging for a qualified interpreter or translator whenever possible. A licensee shall provide information in a manner that is understandable and culturally appropriate for the client. Clients shall be given sufficient opportunity to ask questions and receive answers about social work services, including electronic delivery of services, if appropriate.

c. If a client lacks the capacity to provide informed consent, a licensee shall protect the client’s interests by seeking permission from an appropriate third party and shall inform the client consistent with the client’s level of understanding. In such instances, a licensee shall seek to ensure that the third party acts in a manner consistent with the client’s wishes and interests. A licensee shall take reasonable steps to enhance the client’s ability to give informed consent.

d. If a client is receiving services involuntarily, a licensee shall provide information about the nature and extent of services and about the extent of the client’s right to refuse services.

e. The provision of social work services to an individual in this state through any electronic means, including the Internet, telephone, or the Iowa Communications Network or any fiberoptic media, regardless of the location of the licensee, shall constitute the practice of social work in the state of Iowa and shall be subject to regulation in accordance with Iowa Code chapters 147 and 154C and the administrative rules of the board. A licensee who provides services via electronic media shall inform recipients of the limitations and risks associated with such services.

f. A licensee shall obtain a client’s informed consent before audiotaping or videotaping the client or permitting a third party to observe services provided to the client.

g. A licensee shall develop policies regarding the sharing, retention, and storage of digital and other electronic communications and records and shall inform clients of applicable policies.

282.2(2) Competence.

a. A licensee shall provide services and represent oneself as competent only within the boundaries of the licensee's education, training, license, certification, consultation received, supervised experience, or other relevant professional experience.

b. A licensee shall provide services in substantive areas or use intervention techniques or approaches that are new only after engaging in appropriate study, training, consultation, and supervision from people who are competent in those areas, interventions, or techniques.

c. When generally recognized standards do not exist with respect to an emerging area of practice, a licensee shall exercise careful judgment and take responsible steps, including appropriate education, research, training, consultation and supervision, to ensure competence and to protect clients from harm.

282.2(3) *Supervision.*

a. A licensee shall exercise appropriate supervision over persons who practice under the supervision of the licensee.

b. A licensee who provides supervision or consultation shall have the necessary knowledge and skill to supervise or consult appropriately and shall do so only within the licensee's areas of knowledge and competence.

c. A licensee who provides supervision or consultation is responsible for setting clear, appropriate, and culturally sensitive boundaries.

d. A licensee shall not engage in any dual or multiple relationships with supervisees if there is a risk of exploitation of or potential harm to the supervisee.

e. A licensee shall not engage in sexual activities or sexual contact with a supervisee, student, trainee, or other colleague over whom the licensee exercises professional or supervisory authority.

f. A licensee shall not employ, assign, or supervise an individual in the performance of services that require a license if the individual has not received a license to perform the services or if the individual has a suspended, revoked, lapsed, or inactive license.

g. A licensee shall not practice without receiving supervision, as needed, given the licensee's level of practice, experience, and need.

282.2(4) *Privacy and confidentiality.*

a. A licensee shall not disclose or be compelled to disclose client information unless required by law, except under the following limited circumstances:

(1) If the information reveals the contemplation or commission of a crime. This includes situations in which the licensee determines that disclosure is necessary to prevent serious, foreseeable, and imminent harm to the client or another specific identifiable person.

(2) If the client waives the privilege by bringing criminal, civil, or administrative charges or action against a licensee.

(3) With the written informed consent of the client that explains to whom the client information will be disclosed or released and the purpose and time frame for the release of information. If the client is deceased or unable to provide informed consent, a licensee shall obtain written consent from the client's personal representative, another person authorized to sue, or the beneficiary of an insurance policy on the client's life, health, or physical condition.

(4) To testify in a court or administrative hearing concerning matters pertaining to the welfare of children.

(5) To seek collaboration or consultation with professional colleagues or administrative superiors on behalf of the client.

(6) Pursuant to a validly issued subpoena or court order.

In the event of a disclosure of information under any of the circumstances stated above, the licensee shall disclose the least amount of confidential information necessary and shall reveal only that information that is directly relevant to the purpose for which the disclosure is made.

b. Before the disclosure is made, a licensee shall inform a client, to the extent possible, about the disclosure of confidential information and the potential consequences of the disclosure. This requirement applies whether a licensee discloses confidential information on the basis of client consent or other legal basis.

c. A licensee shall discuss with clients and other interested parties the nature of confidentiality and limitations of a client's right to confidentiality. A licensee shall review with clients the circumstances under which confidential information may be requested and when disclosure of confidential information may be legally required. This discussion should occur as soon as possible in the professional relationship and as needed throughout the course of the relationship.

d. When a licensee provides counseling or psychosocial therapy services to families, couples, or groups, the licensee shall seek agreement among the parties involved concerning each individual's right to confidentiality and obligation to preserve the confidentiality of information shared by others. A licensee shall inform participants in family, couples, or group counseling or psychosocial therapy that the licensee cannot guarantee that all participants will honor such agreements.

e. A licensee shall inform clients involved in family, couples, marital, or group counseling or psychosocial therapy of the licensee's, the licensee's employer's, and agency's policy concerning the licensee's disclosure of confidential information among the parties involved in the counseling or therapy.

f. A licensee shall not disclose confidential information to third-party payers unless a client has authorized such disclosure. A licensee shall inform the client of the nature of the client information to be disclosed or released to the third-party payer.

g. A licensee shall not discuss confidential information in any setting unless privacy can be ensured. A licensee shall not discuss confidential information in public or semipublic areas such as hallways, waiting rooms, elevators, and restaurants.

h. A licensee shall protect the confidentiality of clients during legal proceedings to the extent permitted by law.

i. A licensee shall protect the confidentiality of clients when the licensee is responding to requests from members of the media.

j. A licensee shall protect the confidentiality of clients' written and electronic records and other sensitive information. A licensee shall take reasonable steps to ensure that client records are stored in a secure location and that client records are not available to others who are not authorized to have access.

k. A licensee shall take precautions to ensure and maintain the confidentiality of information transmitted to other parties through the use of computers, electronic mail, facsimile machines, telephones, telephone answering machines, and other electronic or computer technology.

l. A licensee shall transfer or dispose of client records in a manner that protects client confidentiality and is consistent with federal and state statutes, rules and regulations and the guidelines of the licensee's employer or agency, if applicable.

m. A licensee shall take reasonable precautions to protect client confidentiality in the event of the licensee's termination of practice, incapacitation, or death.

n. A licensee shall not disclose identifying information when discussing a client for teaching or training purposes or in public presentations unless the client has consented to disclosure of confidential information.

o. A licensee shall not disclose identifying information when discussing a client with consultants unless the client has consented to disclosure of confidential information or there is a compelling need for such disclosure.

p. Consistent with the preceding standards, a licensee shall protect the confidentiality of deceased clients.

282.2(5) Record keeping.

a. A licensee shall maintain sufficient, timely, and accurate documentation in client records. A licensee's records shall reflect the services provided, facilitate the delivery of services, and ensure continuity of services in the future.

b. A licensee who provides clinical services in any employment setting, including private practice, shall maintain timely records that include subjective and objective data, assessment or diagnosis, a treatment plan, and any revisions to the assessment, diagnosis, or plan made during the course of treatment.

c. A licensee who provides clinical services shall store records in accordance with state and federal statutes, rules, and regulations governing record retention and with the guidelines of the

licensee's employer or agency, if applicable. If no other legal provisions govern record retention, a licensee shall store all client records for a minimum of seven years following the termination of services to ensure reasonable future access.

282.2(6) Access to records. A licensee who provides clinical services shall:

a. Provide the client with reasonable access to records concerning the client. A licensee who is concerned that a client's access to the client's records could cause serious misunderstanding or harm to the client shall provide assistance in interpreting the records and consultation with the client regarding the records. A licensee may limit a client's access to the client's records, or portions of the records, only in exceptional circumstances when there is compelling evidence that such access would cause serious harm to the client. Both the client's request and the rationale for withholding some or all of a record should be documented in the client's records.

b. Take steps to protect the confidentiality of other individuals identified or discussed in any records to which a client is provided access.

282.2(7) Billing and fees.

a. A licensee shall bill only for services which have been provided.

b. A licensee shall not accept goods or services from the client or a third party in exchange for the licensee's services.

c. A licensee shall not solicit a private fee or other remuneration for providing services to clients who are entitled to such available services through the licensee's employer or agency.

d. A licensee shall not accept, give, offer or solicit a fee, commission, rebate, fee split, or other form of consideration for the referral of a client.

e. A licensee shall not permit any person to share in the fees for professional services, other than a partner, employee, an associate in a professional firm, or a consultant to the licensee.

f. A licensee who provides clinical services shall, when appropriate:

(1) Establish and maintain billing practices that accurately reflect the nature and extent of services provided.

(2) Inform the client of the fee at the initial session or meeting with the client. A licensee shall provide a written payment arrangement to a client at the commencement of the professional relationship.

(3) Ensure that the fees are fair, reasonable, and commensurate with the services performed.

282.2(8) Dual relationships and conflicts of interest.

a. "Dual relationship" means that a licensee develops or assumes a secondary role with a client, including but not limited to a social relationship, an emotional relationship, an employment relationship, or a business association. For purposes of these rules, "dual relationship" does not include a sexual relationship. Standards governing sexual relationships are found in subrule 282.2(9).

(1) Current clients. A licensee shall not engage in a dual relationship with a client.

(2) Former clients. A licensee shall not engage in a dual relationship with a client within five years of the termination of the client relationship. A licensee shall not engage in a dual relationship with a former client, regardless of the length of time elapsed since termination of the client relationship, when there is a risk of exploitation or potential harm to a client or former client.

(3) Unavoidable dual relationships with current and former clients. If a dual relationship with a current or former client is unavoidable, the licensee shall take steps to protect the client and shall be responsible for setting clear, appropriate, and culturally sensitive boundaries. The burden shall be on the licensee to show that the dual relationship was unavoidable. In determining whether a dual relationship was unavoidable, the board shall consider the size of the community, the nature of the relationship, and the risk of exploitation or harm to a client or former client.

b. Conflicts of interest.

(1) A licensee shall avoid conflicts of interest that interfere with the exercise of professional discretion and impartial judgment.

(2) A licensee shall not continue in a professional relationship with a client when the licensee has become emotionally involved with the client to the extent that objectivity is no longer possible in providing the required professional services.

(3) A licensee shall inform the client when a real or potential conflict of interest arises and take reasonable steps to resolve the issue in a manner that makes the client's interests primary and protects the client's interests to the greatest extent possible. In some cases, protecting the client's interests may require termination of the professional relationship with proper referral of the client.

(4) A licensee shall not take unfair advantage of any professional relationship or exploit others to further the licensee's personal, religious, political, or business interests.

(5) A licensee who provides services to two or more people who have a relationship with each other shall clarify with all parties, when appropriate and in a manner consistent with the confidentiality standards of subrule 282.2(4), which individuals will be considered clients and the nature of the licensee's professional obligations to the various individuals who are receiving services. A licensee who anticipates a conflict of interest among the individuals receiving services or who anticipates having to perform in potentially conflicting roles shall clarify, when appropriate and in a manner consistent with the confidentiality standards at subrule 282.2(4), the licensee's role with the parties involved and take appropriate action to minimize any conflict of interest.

282.2(9) *Sexual relationships.*

a. Current clients. A licensee shall not engage in sexual activities or sexual contact with a client, regardless of whether such contact is consensual or nonconsensual.

b. Former clients. A licensee shall not engage in sexual activities or sexual contact with a former client within the five years following termination of the client relationship. A licensee shall not engage in sexual activities or sexual contact with a former client, regardless of the length of time elapsed since termination of the client relationship, if the client has a history of physical, emotional, or sexual abuse or if the client has ever been diagnosed with any form of psychosis or personality disorder or if the client is likely to remain in need of therapy due to the intensity or chronicity of a problem.

c. A licensee shall not engage in sexual activities or sexual contact with a client's or former client's spouse or significant other.

d. A licensee shall not engage in sexual activities or sexual contact with a client's or former client's relative within the second degree of consanguinity (client's parent, grandparent, child, grandchild, or sibling) when there is a risk of exploitation or potential harm to a client or former client.

e. A licensee shall not provide clinical services to an individual with whom the licensee has had prior sexual contact.

282.2(10) *Physical contact.* A licensee shall not engage in physical contact with a client when there is a possibility of psychological harm to the client as a result of the contact. A licensee who engages in appropriate physical contact with a client is responsible for setting clear, appropriate, and culturally and age-sensitive boundaries which govern such contact.

282.2(11) *Termination of services.*

a. A licensee shall terminate services to a client when such service is no longer required or no longer serves the client's needs or interests.

b. A licensee shall take reasonable steps to avoid abandoning clients who are still in need of services. A licensee shall assist in making appropriate arrangements for continuation of services when necessary.

c. A licensee shall not terminate services to pursue a social, financial, business, romantic, or sexual relationship with a client.

d. A licensee who anticipates the termination or interruption of services to a client shall notify the client promptly and seek the transfer, referral, or continuation of services in relation to the client's needs and preferences.

e. A licensee who is leaving an employment setting shall inform clients, to the extent possible given the nature of the termination of the employment relationship, of appropriate options for the continuation of services and of the benefits and risks of the options.

f. If the employer who terminates a licensee is also a licensee, the employer shall provide notice to clients or allow the licensee the opportunity to provide notice to clients to ensure appropriate case closure or continuation or transfer of services if continued treatment is necessary.

g. A licensee who provides clinical services shall comply with the following additional standards regarding termination of the client relationship:

(1) Termination of a client relationship shall be documented in the client record. Absent written documentation of termination, the professional relationship shall be considered ongoing.

(2) A licensee who practices in a fee-for-service setting may terminate services to a client who is not paying an overdue balance only if the financial contractual arrangements have been made clear to the client, if the client does not pose an imminent danger to self or others, and if the clinical and other consequences of the current nonpayment have been addressed and discussed with the client. Prior to terminating services under this subrule, a licensee shall make reasonable efforts to collect the unpaid fees and shall make appropriate referrals for the client.

282.2(12) Misrepresentations, disclosure. A licensee shall not:

a. Knowingly make a materially false statement, or fail to disclose a relevant material fact, in a letter of reference, application, referral, report or other document.

b. Knowingly allow another person to use the licensee's license or credentials.

c. Knowingly aid or abet a person who is misrepresenting the person's professional credentials or competencies.

d. Impersonate another person or misrepresent an organizational affiliation in one's professional practice.

e. Further the application or make a recommendation for professional licensure of another person who is known by the licensee to be unqualified in respect to character, education, experience, or other relevant attribute.

f. Fail to notify the appropriate licensing authority of any human services professional who is practicing or teaching in violation of the laws or rules governing that person's professional discipline.

g. Engage in professional activities, including advertising, that involve dishonesty, fraud, deceit, or misrepresentation.

h. Advertise services in a false or misleading manner or fail to indicate in the advertisement the name, the highest relevant degree and licensure status of the provider of services.

i. Fail to distinguish, or purposely mislead the reader or listener in public announcements, addresses, letters and reports as to whether the statements are made as a private individual or whether they are made on behalf of an employer or organization.

j. Engage in direct solicitation of potential clients for pecuniary gain in a manner or in circumstances which constitute overreacting, undue influence, misrepresentation or invasion of privacy.

k. Fail to inform each client of any financial interests that might accrue to the licensee for referral to any other person or organization or for the use of tests, books, or apparatus.

l. Fail to inform each client that the client may be entitled to the same services from a public agency, if the licensee is employed by that public agency and also offers services privately.

m. Make claims of professional superiority which cannot be substantiated by the licensee.

n. Guarantee that satisfaction or a cure will result from the performance of professional services.

o. Claim or use any secret or special method of treatment or techniques which the licensee refuses to divulge to professional colleagues.

p. Take credit for work not personally performed whether by giving inaccurate information or failing to give accurate information.

q. Offer social work services or use the designation of licensed bachelor social worker, licensed master social worker, or licensed independent social worker; or use the designations LBSW, LMSW, or LISW or any other designation indicating licensure status; or hold oneself out as practicing at a certain level of licensure unless the licensee is duly licensed as such.

r. Permit another person to use the licensee's license for any purpose.

s. Practice outside the scope of a license.

282.2(13) Impairments.

a. A licensee shall not:

(1) Practice in a professional relationship while intoxicated or under the influence of alcohol or drugs not prescribed by a licensed physician.

(2) Practice in a professional relationship while experiencing a mental or physical impairment that adversely affects the ability of the licensee to perform professional duties in a competent and safe manner.

(3) Practice in a professional relationship if involuntarily committed for treatment of mental illness, drug addiction, or alcoholism.

b. A licensee who self-reports an impairment or suspected impairment to the board may be eligible for confidential monitoring by the impaired practitioner review committee. The licensee shall be provided the Impaired Practitioner Report form to initiate the process. Standards governing the impaired practitioner review committee may be found in 645—Chapter 16.

282.2(14) Research. If engaged in research, a licensee shall:

a. Consider carefully the possible consequences for human beings participating in the research.
b. Protect each participant from unwarranted physical and mental harm.
c. Ensure that the consent of the participant is voluntary and informed and that each participant executes a signed informed consent form which details the nature of the research and any known possible consequences.

d. Treat information obtained as confidential.

e. Not knowingly report distorted, erroneous, or misleading information.

282.2(15) Organization relationships and business practices. A licensee shall not:

a. Solicit the clients of colleagues or assume professional responsibility for clients of another agency or colleague without appropriate communication with that agency or colleague.

b. Abandon an agency, organization, institution, or group practice without reasonable notice or under circumstances which seriously impair the delivery of professional care to clients.

c. Deliberately falsify client records.

d. Fail to submit required reports and documents in a timely fashion to the extent that the well-being of the client is adversely affected.

e. Delegate professional responsibilities to a person when the licensee knows, or has reason to know, that the person is not qualified by training, education, experience, or classification to perform the requested duties.

282.2(16) Discrimination and sexual harassment.

a. A licensee shall not practice, condone, or facilitate discrimination against a client, student, or supervisee on the basis of race, ethnicity, national origin, color, sex, sexual orientation, age, marital status, political belief, religion, mental or physical disability, diagnosis, or social or economic status.

b. A licensee shall not sexually harass a client, student, or supervisee. Sexual harassment includes sexual advances, sexual solicitation, requests for sexual favors, and other verbal or physical conduct of a sexual nature.

282.2(17) General. A licensee shall not:

a. Practice without receiving supervision as needed, given the licensee's level of practice, experience, and need.

b. Practice a professional discipline without an appropriate license or after expiration of the required license.

c. Physically or verbally abuse a client or colleague.

d. Obtain, possess, or attempt to obtain or possess a controlled substance without lawful authority; or sell, prescribe, give away, or administer controlled substances.

282.2(18) Relationship between the board's rules of conduct and the National Association of Social Workers (NASW) Code of Ethics. The NASW Code of Ethics is one resource for practitioners with respect to practice and ethical issues, and selected sections from the NASW Code of Ethics have been incorporated into the rules of conduct. A licensee's professional conduct is governed by the board's rules of conduct, and a licensee may be disciplined for violation of these rules.

282.2(19) Electronic social work services. A licensee shall:

a. Assess the client's suitability and capacity for online and remote services at the point of the client's first contact and use professional judgment to determine whether an initial in-person, videoconference, or telephone consultation is warranted before undertaking electronic social work services.

b. Take reasonable steps to verify the client's identity, ability to consent to services, and location. When verification of a client's identity is not feasible, social workers shall inform the client of the limitations of services that can be provided.

c. Continually assess a client's suitability for electronic social work services during the course of the professional relationship.

[ARC 3744C, IAB 4/11/18, effective 5/16/18]

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CHAPTER 283
DISCIPLINE FOR SOCIAL WORKERS

[Prior to 9/19/01, see 645—Chapter 280]

[Prior to 9/3/03, see 645—Chapter 282]

645—283.1(154B) Definitions.

“*Board*” means the board of social work.

“*Discipline*” means any sanction the board may impose upon licensees.

“*Licensee*” means a person licensed to practice social work.

[ARC 8371B, IAB 12/16/09, effective 1/20/10]

645—283.2(272C) Grounds for discipline. The board may impose any of the disciplinary sanctions provided in rule 645—283.3(272C) when the board determines that the licensee is guilty of any of the following acts or offenses:

283.2(1) Fraud in procuring a license. Fraud in procuring a license includes, but is not limited to:

a. An intentional perversion of the truth in making application for a license to practice in this state;
b. False representations of a material fact, whether by word or by conduct, by false or misleading allegations, or by concealment of that which should have been disclosed when making application for a license in this state; or

c. Attempting to file or filing with the board or the department of public health any false or forged diploma or certificate or affidavit or identification or qualification in making an application for a license in this state.

283.2(2) Professional incompetency. Professional incompetency includes, but is not limited to:

a. A substantial lack of knowledge or ability to discharge professional obligations within the scope of practice.

b. A substantial deviation from the standards of learning or skill ordinarily possessed and applied by other social workers in the state of Iowa acting in the same or similar circumstances.

c. A failure to exercise the degree of care which is ordinarily exercised by the average social worker acting in the same or similar circumstances.

d. Failure to conform to the minimal standard of acceptable and prevailing practice of licensed social workers in this state.

283.2(3) Knowingly making misleading, deceptive, untrue or fraudulent representations in the practice of social work or engaging in unethical conduct or practice harmful or detrimental to the public. Proof of actual injury need not be established.

283.2(4) Practice outside the scope of the profession.

283.2(5) Use of untruthful or improbable statements in advertisements. Use of untruthful or improbable statements in advertisements includes, but is not limited to, an action by a licensee in making information or intention known to the public which is false, deceptive, misleading or promoted through fraud or misrepresentation.

283.2(6) Habitual intoxication or addiction to the use of drugs.

a. The inability of a licensee to practice with reasonable skill and safety by reason of the excessive use of alcohol on a continuing basis.

b. The excessive use of drugs which may impair a licensee’s ability to practice with reasonable skill or safety.

283.2(7) Obtaining, possessing, attempting to obtain or possess, or administering controlled substances without lawful authority.

283.2(8) Falsification of client records.

283.2(9) Acceptance of any fee by fraud or misrepresentation.

283.2(10) Negligence by the licensee in the practice of the profession. Negligence by the licensee in the practice of the profession includes a failure to exercise due care, including negligent delegation of duties or supervision of employees or other individuals, whether or not injury results; or any conduct, practice or conditions which impair the licensee’s ability to safely and skillfully practice the profession.

283.2(11) Conviction of a crime related to the profession or occupation of the licensee or the conviction of any crime that would affect the licensee's ability to practice within the profession, regardless of whether the judgment of conviction or sentence was deferred. A copy of the record of conviction or plea of guilty shall be conclusive evidence.

283.2(12) Violation of a regulation, rule, or law of this state, another state, or the United States, which relates to the practice of social work, including, but not limited to, the rules of conduct found in 645—282.2(154C).

283.2(13) Revocation, suspension, or other disciplinary action taken by a licensing authority of this state, another state, territory, or country; or failure by the licensee to report such action in writing within 30 days of the final action by such licensing authority. A stay by an appellate court shall not negate this requirement; however, if such disciplinary action is overturned or reversed by a court of last resort, the report shall be expunged from the records of the board.

283.2(14) Failure of a licensee or an applicant for licensure in this state to report any voluntary agreements restricting the individual's practice of social work in another state, district, territory or country.

283.2(15) Failure to notify the board of a criminal conviction within 30 days of the action, regardless of the jurisdiction where it occurred.

283.2(16) Failure to notify the board within 30 days after occurrence of any judgment or settlement of a malpractice claim or action.

283.2(17) Engaging in any conduct that subverts or attempts to subvert a board investigation.

283.2(18) Failure to respond within 30 days of receipt of communication from the board which was sent by registered or certified mail.

283.2(19) Failure to comply with a subpoena issued by the board or failure to cooperate with an investigation of the board.

283.2(20) Failure to comply with the terms of a board order or the terms of a settlement agreement or consent order.

283.2(21) Failure to pay costs assessed in any disciplinary action.

283.2(22) Submission of a false report of continuing education or failure to submit the biennial report of continuing education.

283.2(23) Failure to report another licensee to the board for any violations listed in these rules, pursuant to Iowa Code section 272C.9.

283.2(24) Knowingly aiding, assisting or advising a person to unlawfully practice social work.

283.2(25) Failure to report a change of name or address within 30 days after it occurs.

283.2(26) Representing oneself as a licensed social worker when one's license has been suspended or revoked, or when one's license is on inactive status.

283.2(27) Permitting another person to use the licensee's license for any purpose.

283.2(28) Permitting an unlicensed employee or person under the licensee's control to perform activities that require a license.

283.2(29) Unethical conduct. In accordance with Iowa Code section 147.55(3), behavior (i.e., acts, knowledge, and practices) which constitutes unethical conduct may include, but is not limited to, the following:

a. Verbally or physically abusing a client or coworker.

b. Improper sexual contact with or making suggestive, lewd, lascivious or improper remarks or advances to a client or coworker.

c. Betrayal of a professional confidence.

d. Engaging in a professional conflict of interest.

283.2(30) Mental or physical inability reasonably related to and adversely affecting the licensee's ability to practice in a safe and competent manner.

283.2(31) Being adjudged mentally incompetent by a court of competent jurisdiction.

283.2(32) Repeated failure to comply with standard precautions for preventing transmission of infectious diseases as issued by the Centers for Disease Control and Prevention of the United States Department of Health and Human Services.

283.2(33) Violation of the terms of an initial agreement with the impaired practitioner review committee or violation of the terms of an impaired practitioner recovery contract with the impaired practitioner review committee.

[ARC 9930B, IAB 12/28/11, effective 2/1/12; ARC 3744C, IAB 4/11/18, effective 5/16/18]

645—283.3(147,272C) Method of discipline. The board has the authority to impose the following disciplinary sanctions:

1. Revocation of license.
2. Suspension of license until further order of the board or for a specific period.
3. Prohibit permanently, until further order of the board, or for a specific period the licensee's engaging in specified procedures, methods, or acts.
4. Probation.
5. Require additional education or training.
6. Require a reexamination.
7. Order a physical or mental evaluation, or order alcohol and drug screening within a time specified by the board.
8. Impose civil penalties not to exceed \$1000.
9. Issue a citation and warning.
10. Such other sanctions allowed by law as may be appropriate.

645—283.4(272C) Discretion of board. The following factors may be considered by the board in determining the nature and severity of the disciplinary sanction to be imposed:

1. The relative serious nature of the violation as it relates to ensuring a high standard of professional care for the citizens of this state;
2. The facts of the particular violation;
3. Any extenuating facts or other countervailing considerations;
4. The number of prior violations or complaints;
5. The seriousness of prior violations or complaints;
6. Whether remedial action has been taken; and
7. Such other factors as may reflect upon the competency, ethical standards, and professional conduct of the licensee.

645—283.5(154C) Order for mental, physical, or clinical competency examination or alcohol or drug screening. Rescinded IAB 3/10/10, effective 4/14/10.

These rules are intended to implement Iowa Code chapters 147, 154C and 272C.

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CHAPTER 10
CONTROLLED SUBSTANCES
[Prior to 2/10/88, see Pharmacy Examiners[620] Ch 8]

657—10.1(124) Purpose and scope. This chapter establishes the minimum standards for any activity that involves controlled substances. Any person or business that manufactures; distributes; dispenses; prescribes; conducts instructional activities, research, or chemical analysis with; or imports or exports controlled substances listed in Schedules I through V of Iowa Code chapter 124 in or into the state of Iowa, or that proposes to engage in such activities, shall obtain and maintain a registration issued by the board unless exempt from registration pursuant to rule 657—10.8(124). A person or business required to be registered shall not engage in any activity for which registration is required until the application for registration is granted and the board has issued a certificate of registration to such person or business. A registration is not transferable to any person or business.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.2(124) Definitions. For the purposes of this chapter, the following definitions shall apply:

“*Authorized collection program*” means a program administered by a registrant that has modified its registration with DEA to collect controlled substances for the purpose of disposal. Federal regulations for such programs can be found at deادiversion.usdoj.gov/drug_disposal/. Modification to the registrant’s Iowa controlled substances Act registration shall not be required.

“*Board*” means the Iowa board of pharmacy.

“*CSA*” means the Iowa uniform controlled substances Act.

“*CSA registration*” or “*registration*” means the registration issued by the board pursuant to the CSA that signifies the registrant’s authorization to engage in registered activities with controlled substances.

“*DEA*” means the United States Department of Justice, Drug Enforcement Administration.

“*Individual practitioner*” means a physician or surgeon (M.D.), osteopathic physician or surgeon (D.O.), dentist (D.D.S. or D.M.D.), doctor of veterinary medicine (D.V.M.), podiatric physician (D.P.M.), optometrist (O.D.), physician assistant (P.A.), resident physician, advanced registered nurse practitioner (A.R.N.P.), or prescribing psychologist.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.3(124) Who shall register. The following persons or businesses shall register on forms provided by the board:

1. Manufacturers, distributors, importers, and exporters located in Iowa. Effective January 1, 2018, nonresident manufacturers, distributors, importers, and exporters distributing controlled substances into Iowa.

2. Reverse distributors located in Iowa. Effective January 1, 2018, nonresident reverse distributors engaging in the transfer of controlled substances with registrants located in Iowa.

3. Individual practitioners located in Iowa who are administering, dispensing, or prescribing controlled substances and individual practitioners located outside of Iowa who are dispensing or prescribing controlled substances via telehealth services to patients located in Iowa.

4. Pharmacies located in Iowa that are dispensing controlled substances. Effective January 1, 2018, pharmacies located outside of Iowa that are delivering controlled substances to patients located in Iowa.

5. Hospitals located in Iowa that are administering or dispensing controlled substances. Effective January 1, 2018, hospitals located outside of Iowa that are administering or dispensing controlled substances to patients located in Iowa.

6. Emergency medical service programs that are administering controlled substances to patients located in Iowa.

7. Care facilities that are located in Iowa.

8. Researchers, analytical laboratories, and teaching institutions that are located in Iowa.

9. Animal shelters and dog training facilities that are located in Iowa.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.4 Reserved.

657—10.5(124) Application. Applicants for initial registration, registration renewal pursuant to rule 657—10.6(124), or modifications pursuant to rule 657—10.9(124) shall complete the appropriate application and shall include all required information and attachments. Each registration application shall require submission of a \$90 registration fee except as provided in subrule 10.5(3).

10.5(1) Signature requirements. Each application, attachment, or other document filed as part of an application shall be signed by the applicant as follows:

a. If the applicant is an individual practitioner, the practitioner shall sign the application and supporting documents.

b. If the applicant is a business, the application and supporting documents shall be signed by the person ultimately responsible for the security and maintenance of controlled substances at the registered location.

10.5(2) Submission of multiple applications. Any person or business required to obtain more than one registration pursuant to rule 657—10.7(124) or 657—10.8(124) may submit all applications in one package. Each application shall be complete and shall not refer to any accompanying application or any attachment to an accompanying application for required information.

10.5(3) Registration fee exemptions. The registration fee is waived for federal, state, and local law enforcement agencies and for the following federal and state institutions: hospitals, health care or teaching institutions, and analytical laboratories authorized to possess, manufacture, distribute, and dispense controlled substances in the course of official duties. In order to enable law enforcement agency laboratories to obtain and transfer controlled substances for use as standards in chemical analysis, such laboratories shall maintain a registration to conduct chemical analysis (analytical laboratory). Such laboratories shall be exempt from any registration fee. Exemption from payment of any fees as provided in this subrule does not relieve the entity of registration or of any other requirements or duties prescribed by law.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.6(124) Registration renewal. Each registration shall be renewed prior to its biennial expiration. A registrant may renew its registration up to 60 days prior to the registration expiration. The fee for registration renewal shall be \$90.

10.6(1) Delinquent registration grace period. A registration that is not renewed prior to the first day of the month following expiration shall be delinquent. A registrant may continue operations within the first 30 days following expiration while the license is delinquent if the registrant is in the process of renewing the registration. Failure to renew a registration prior to the first day of the month following expiration, but when submitting a completed renewal application within the 30 days following expiration, shall require payment of the renewal fee and a penalty fee of \$90.

10.6(2) Delinquent registration reactivation beyond grace period. If a registration renewal application is not postmarked or hand-delivered to the board office within 30 days following its expiration date, the registrant may not conduct operations that involve controlled substances until the registrant reactivates the registration. A registrant may apply for reactivation by submitting a registration application for reactivation and a \$360 fee. As part of the reactivation application, the registrant shall disclose the activities conducted with respect to controlled substances while the registration was expired. A registrant that continues to conduct activities with respect to controlled substances without an active registration may be subject to disciplinary sanctions.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.7(124) Separate registration for independent activities; coincident activities. The following activities are deemed to be independent of each other and shall require separate registration. Any person or business engaged in more than one of these activities shall be required to separately register for each independent activity, provided, however, that registration in an independent activity shall authorize the registrant to engage in activities identified coincident with that independent activity.

10.7(1) *Manufacturing controlled substances.* A person or business registered to manufacture controlled substances in Schedules I through V may distribute any substances for which registration to manufacture was issued. A person or business registered to manufacture controlled substances in Schedules II through V may conduct chemical analysis and preclinical research, including quality control analysis, with any substances listed in those schedules for which the person or business is registered to manufacture.

10.7(2) *Distributing controlled substances.* This independent activity includes the delivery, other than by administering or dispensing, of controlled substances listed in Schedules I through V. No coincident activities are authorized.

10.7(3) *Dispensing, administering, prescribing, or instructing with controlled substances.* These independent activities include, but are not limited to, prescribing, administering, and dispensing by individual practitioners; dispensing by pharmacies and hospitals; and conducting instructional activities with controlled substances listed in Schedules II through V. A person or business registered for these independent activities may conduct research and instructional activities with those substances for which the person or business is registered to the extent authorized under state law. If an entity that engages in the distribution, administration, dispensing, or storing of controlled substances maintains multiple licenses, such as a hospital that has both inpatient and outpatient pharmacies, a separate registration shall be maintained for each license.

10.7(4) *Conducting research with controlled substances listed in Schedule I.* A researcher may manufacture or import the substances for which registration was issued provided that such manufacture or import is permitted under the federal DEA registration. A researcher may distribute the substances for which registration was issued to persons or businesses registered or authorized to conduct research with that class of substances or registered or authorized to conduct chemical analysis with controlled substances.

10.7(5) *Conducting research with controlled substances listed in Schedules II through V.* A researcher may conduct chemical analysis with controlled substances in those schedules for which registration was issued, may manufacture such substances if and to the extent such manufacture is permitted under the federal DEA registration, and may import such substances for research purposes. A researcher may distribute controlled substances in those schedules for which registration was issued to persons registered or authorized to conduct chemical analysis, instructional activities, or research with such substances, and to persons exempt from registration pursuant to Iowa Code section 124.302(3), and may conduct instructional activities with controlled substances.

10.7(6) *Conducting chemical analysis with controlled substances.* A person or business registered to conduct chemical analysis with controlled substances listed in Schedules I through V may manufacture and import controlled substances for analytical or instructional activities; may distribute such substances to persons registered or authorized to conduct chemical analysis, instructional activities, or research with such substances and to persons exempt from registration pursuant to Iowa Code section 124.302(3); may export such substances to persons in other countries performing chemical analysis or enforcing laws relating to controlled substances or drugs in those countries; and may conduct instructional activities with controlled substances.

10.7(7) *Importing or exporting controlled substances.* A person or business registered to import controlled substances listed in Schedules I through V may distribute any substances for which such registration was issued.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.8(124) Separate registrations for separate locations; exemption from registration. A separate registration is required for each principal place of business or professional practice location where controlled substances are manufactured, distributed, imported, exported, dispensed, stored, or collected for the purpose of disposal unless the person or business is exempt from registration pursuant to Iowa Code section 124.302(3), this rule, or federal regulations.

10.8(1) *Warehouse.* A warehouse where controlled substances are stored by or on behalf of a registered person or business shall be exempt from registration except as follows:

a. Registration of the warehouse shall be required if such controlled substances are distributed directly from that warehouse to registered locations other than the registered location from which the substances were delivered to the warehouse.

b. Registration of the warehouse shall be required if such controlled substances are distributed directly from that warehouse to persons exempt from registration pursuant to Iowa Code section 124.302(3).

10.8(2) Sales office. An office used by agents of a registrant where sales of controlled substances are solicited, made, or supervised shall be exempt from registration. Such office shall not contain controlled substances, except substances used for display purposes or for lawful distribution as samples, and shall not serve as a distribution point for filling sales orders.

10.8(3) Prescriber's office. An office used by a prescriber who is registered at another location and where controlled substances are prescribed but where no supplies of controlled substances are maintained shall be exempt from registration. However, a prescriber who practices at more than one office location where controlled substances are administered or otherwise dispensed as a regular part of the prescriber's practice shall register at each location wherein the prescriber maintains supplies of controlled substances.

10.8(4) Prescriber in hospital. A prescriber who is registered at another location and who treats patients and may order the administration of controlled substances in a hospital other than the prescriber's registered practice location shall not be required to obtain a separate registration at the location of the hospital.

10.8(5) Affiliated interns, residents, or foreign physicians. An individual practitioner who is an intern, resident, or foreign physician may dispense and prescribe controlled substances under the registration of the hospital or other institution which is registered and by whom the practitioner is employed provided that:

a. The hospital or other institution by which the individual practitioner is employed has determined that the practitioner is permitted to dispense or prescribe drugs by the appropriate licensing board.

b. Such individual practitioner is acting only in the scope of employment or practice in the hospital, institution, internship program, or residency program.

c. The hospital or other institution authorizes the intern, resident, or foreign physician to dispense or prescribe under the hospital registration and designates a specific internal code number, letters, or combination thereof which shall be appended to the institution's DEA registration number, preceded by a hyphen (e.g., AP1234567-10 or AP1234567-12).

d. The hospital or institution maintains a current list of internal code numbers identifying the corresponding individual practitioner, available for the purpose of verifying the authority of the prescribing individual practitioner.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.9(124) Modification or termination of registration. A registered individual or business shall apply to modify a current registration as provided by this rule.

10.9(1) Change of substances authorized. Any registrant shall apply to modify the substances authorized by the registration by submitting a written request to the board. The request shall include the registrant's name, address, telephone number, registration number, and the substances or schedules to be added to or removed from the registration and shall be signed by the same person who signed the most recent application for registration or registration renewal. No fee shall be required for the modification.

10.9(2) Change of address of registered location.

a. *Individual practitioner or researcher.* An entity registered as an individual practitioner or researcher shall apply to change the address of the registered location by submitting a written request to the board. The request shall include the registrant's name, current address, new address, telephone number, effective date of the address change, and registration number, and shall be signed by the registered individual practitioner or the same person who signed the most recent application for registration or registration renewal. No fee shall be required for the modification.

b. *Pharmacy, hospital, care facility, service program, manufacturer, distributor, analytical laboratory, teaching institution, importer, or exporter.* An entity registered as a pharmacy, hospital, care

facility, service program, manufacturer, distributor, analytical laboratory, teaching institution, importer, or exporter shall apply to change the address of the registered location by submitting a completed application and fee for registration as provided in rule 657—10.5(124).

10.9(3) Change of registrant's name.

a. Individual practitioner or researcher. An entity registered as an individual practitioner or researcher shall apply to change the registrant's name by submitting a written request to the board. The request shall include the registrant's current name, new name, address, telephone number, effective date of the name change, and registration number, and shall be signed by the registered individual practitioner or the same person who signed the most recent application for registration or registration renewal. No fee shall be required for the modification. Change of name, as used in this paragraph, refers to a change of the legal name of the registrant and does not authorize the transfer of a registration issued to an individual practitioner or researcher to another individual practitioner or researcher.

b. Pharmacy, hospital, care facility, service program, manufacturer, distributor, analytical laboratory, teaching institution, importer, or exporter. An entity registered as a pharmacy, hospital, care facility, service program, manufacturer, distributor, analytical laboratory, teaching institution, importer, or exporter shall apply to change the registrant name by submitting a completed application and fee for registration as provided in rule 657—10.5(124).

10.9(4) Change of ownership of registered business entity. A change of immediate ownership of a pharmacy, hospital, care facility, service program, manufacturer, distributor, analytical laboratory, teaching institution, importer, or exporter shall require the submission of a completed application and fee for registration as provided in rule 657—10.5(124).

10.9(5) Change of responsible individual. Any registrant, except an individual practitioner or researcher or a pharmacy or hospital, shall apply to change the responsible individual authorized by the registration by submitting a written request to the board. The request shall include the registrant's name, address, and telephone number; the name and title of the current responsible individual and of the new responsible individual; the effective date of the change; and the registration number and shall be signed by the new responsible individual. No fee shall be required for the modification.

a. Individual practitioners and researchers. Responsibility under a registration issued to an individual practitioner or researcher shall remain with the named individual practitioner or researcher. The responsible individual under such registration may not be changed or transferred.

b. Pharmacies and hospitals. The responsible pharmacist may execute a power of attorney for DEA order forms to change responsibility under the registration issued to the pharmacy or hospital. The power of attorney shall include the name, address, DEA registration number, and CSA registration number of the registrant. The power of attorney shall identify the current and new responsible individuals and shall authorize the new responsible individual to execute applications and official DEA order forms to requisition Schedule II controlled substances. The power of attorney shall be signed by both individuals, shall be witnessed by two adults, and shall be maintained by the registrant and available for inspection or copying by representatives of the board or other state or federal authorities. The responsible individual may be changed on the CSA registration by submission of a completed application and fee for registration as provided in rule 657—10.5(124).

10.9(6) Termination of registration. A registration issued to an individual or business shall terminate when the registered individual or business ceases legal existence, discontinues business, or discontinues professional practice. A registration issued to an individual shall terminate upon the death of the individual.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.10(124) Denial, modification, suspension, or revocation of registration.

10.10(1) Grounds for suspension or revocation. The board may suspend or revoke any registration upon a finding that the registrant:

- a.* Has furnished false or fraudulent material information in any application filed under this chapter.
- b.* Has had the registrant's federal registration to manufacture, distribute, or dispense controlled substances suspended or revoked.

c. Has been convicted of a public offense under any state or federal law relating to any controlled substance. For the purpose of this rule only, a conviction shall include a plea of guilty, a forfeiture of bail or collateral deposited to secure a defendant's appearance in court which forfeiture has not been vacated, or a finding of guilt in a criminal action even though entry of the judgment or sentence has been withheld and the individual has been placed on probation.

d. Has committed such acts as would render the registrant's registration under Iowa Code section 124.303 inconsistent with the public interest as determined by that section.

e. Has been subject to discipline by the registrant's respective professional licensing board and the discipline revokes or suspends the registrant's professional license or otherwise disciplines the registrant's professional license in a way that restricts the registrant's authority to handle or prescribe controlled substances. A copy of the record of licensee discipline or a copy of the licensee's surrender of the professional license shall be conclusive evidence.

10.10(2) Limited suspension or revocation. If the board finds grounds to suspend or revoke a registration, the board may limit revocation or suspension of the registration to the particular controlled substance, substances, or schedules with respect to which the grounds for revocation or suspension exist. If the revocation or suspension is limited to a particular controlled substance, substances, or schedules, the registrant shall be given a new certificate of registration reflecting the restrictions imposed by the revocation or suspension; no fee shall be required for the new certificate of registration. The registrant shall deliver the old certificate of registration to the board.

10.10(3) Denial of registration or registration renewal. If, upon examination of an application for registration or registration renewal, including any other information the board has or receives regarding the applicant, the board determines that the issuance of the registration would be inconsistent with the public interest, the board shall serve upon the applicant an order to show cause why the registration should not be denied.

10.10(4) Considerations in denial of registration. In determining the public interest, the board shall consider all of the following factors:

a. Maintenance of effective controls against diversion of controlled substances into other than legitimate medical, scientific, or industrial channels.

b. Compliance with applicable state and local law.

c. Any convictions of the applicant under any federal and state laws relating to any controlled substance.

d. Past experience in the manufacture or distribution of controlled substances, and the existence in the applicant's establishment of effective controls against diversion.

e. Furnishing by the applicant of false or fraudulent material in any application filed under this chapter.

f. Suspension or revocation of the applicant's federal registration to manufacture, distribute, or dispense controlled substances as authorized by federal law.

g. Any other factors relevant to and consistent with the public health and safety.

10.10(5) Order to show cause. Before denying, modifying, suspending, or revoking a registration, the board shall serve upon the applicant or registrant an order to show cause why the registration should not be denied, modified, revoked, or suspended. The order to show cause shall contain a statement of the basis therefore and shall call upon the applicant or registrant to appear before an administrative law judge or the board at a time and place not less than 30 days after the date of service of the order. The order to show cause shall also contain a statement of the legal basis for such hearing and for the denial, revocation, suspension, or modification of registration and a summary of the matters of fact and law asserted. If the order to show cause involves the possible denial of registration renewal, the order shall be served not later than 30 days before the expiration of the registration. Proceedings to refuse renewal of registration shall not abate the existing registration, which shall remain in effect pending the outcome of the administrative hearing unless the board issues an order of immediate suspension pursuant to subrule 10.10(9).

10.10(6) Hearing requested. If an applicant or registrant that has received an order to show cause desires a hearing on the matter, the applicant or registrant shall file a request for a hearing within 30

days after the date of service of the order to show cause. If a hearing is requested, the board shall hold a hearing pursuant to 657—Chapter 35 at the time and place stated in the order and without regard to any criminal prosecution or other proceeding. Unless otherwise ordered by the board, an administrative law judge employed by the department of inspections and appeals shall be assigned to preside over the case and to draft a proposed decision for the board's consideration.

10.10(7) *Waiver of hearing.* If an applicant or registrant entitled to a hearing on an order to show cause fails to file a request for hearing, or if the applicant or registrant requests a hearing but fails to appear at the hearing, the applicant or registrant shall be deemed to have waived the opportunity for a hearing unless the applicant or registrant shows good cause for such failure.

10.10(8) *Final board order when hearing waived.* If an applicant or registrant entitled to a hearing waives or is deemed to have waived the opportunity for a hearing, the executive director of the board may cancel the hearing and issue, on behalf of the board, the board's final order on the order to show cause.

10.10(9) *Order of immediate suspension.* The board may suspend any registration simultaneously with the service upon the registrant of an order to show cause why such registration should not be revoked or suspended if the board finds there is an imminent danger to the public health or safety that warrants such action. If the board suspends a registration simultaneously with the service of the order to show cause upon the registrant, it shall serve upon the registrant with the order to show cause an order of immediate suspension containing a statement of its findings regarding the danger to public health or safety. The suspension shall continue in effect until the conclusion of the proceedings, including judicial review thereof, under the provisions of the Iowa administrative procedure Act, unless sooner withdrawn by the board or dissolved by the order of the district court or an appellate court.

10.10(10) *Disposition of controlled substances.* If the board suspends or revokes a registration, the registrant shall promptly return the certificate of registration to the board. Also, upon service of the order of the board suspending or revoking the registration, the registrant shall deliver all affected controlled substances in the registrant's possession to the board or authorized agent of the board. Upon receiving the affected controlled substances from the registrant, the board or its authorized agent shall place all such substances under seal and retain the sealed controlled substances pending final resolution of any appeals or until a court of competent jurisdiction directs otherwise. No disposition may be made of the substances under seal until the time for taking an appeal has elapsed or until all appeals have been concluded unless a court, upon application, orders the sale of perishable substances and the deposit of proceeds of the sale with the court. Upon a revocation order's becoming final, all such controlled substances may be forfeited to the state.

10.10(11) *Notifications.* The board shall promptly notify the DEA and the Iowa department of public safety of all orders suspending or revoking registration and all forfeitures of controlled substances.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.11 Reserved.

657—10.12(124) *Inspection.* The board may inspect, or cause to be inspected, the establishment of an applicant or registrant. The board shall review the application for registration and other information regarding an applicant or registrant in order to determine whether the applicant or registrant has met the applicable standards of Iowa Code chapter 124 and these rules.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.13(124) *Security requirements.* All registrants shall provide effective controls and procedures to guard against theft and diversion of controlled substances. In order to determine whether a registrant has provided effective controls against diversion, the board shall use the security requirements set forth in these rules as standards for the physical security controls and operating procedures necessary to prevent diversion.

10.13(1) *Physical security.* Physical security controls shall be commensurate with the schedules and quantity of controlled substances in the possession of the registrant in normal business operation. A

registrant shall periodically review and adjust security measures based on rescheduling of substances or changes in the quantity of substances in the possession of the registrant.

a. Controlled substances listed in Schedule I shall be stored in a securely locked, substantially constructed cabinet or safe.

b. Controlled substances listed in Schedules II through V may be stored in a securely locked, substantially constructed cabinet or safe. However, pharmacies and hospitals may disperse these substances throughout the stock of noncontrolled substances in a manner so as to obstruct the theft or diversion of the controlled substances.

c. Controlled substances collected via an authorized collection program for the purpose of disposal shall be stored pursuant to federal regulations, which can be found at deadiversion.usdoj.gov/drug_disposal/.

10.13(2) *Factors in evaluating physical security systems.* In evaluating the overall security system of a registrant or applicant necessary to maintain effective controls against theft or diversion of controlled substances, the board may consider any of the following factors it deems relevant to the need for strict compliance with the requirements of this rule:

- a.* The type of activity conducted.
- b.* The type, form, and quantity of controlled substances handled.
- c.* The location of the premises and the relationship such location bears to security needs.
- d.* The type of building construction comprising the facility and the general characteristics of the building or buildings.
- e.* The type of vault, safe, and secure enclosures available.
- f.* The type of closures on vaults, safes, and secure enclosures.
- g.* The adequacy of key control systems or combination lock control systems.
- h.* The adequacy of electronic detection and alarm systems, if any.
- i.* The adequacy of supervision over employees having access to controlled substances, to storage areas, or to manufacturing areas.
- j.* The extent of unsupervised public access to the facility, including the presence and characteristics of perimeter fencing, if any.
- k.* The procedures for handling business guests, visitors, maintenance personnel, and nonemployee service personnel.
- l.* The availability of local police protection or of the registrant's or applicant's security personnel.
- m.* The adequacy of the registrant's or applicant's system for monitoring the receipt, manufacture, distribution, and disposition of controlled substances.

10.13(3) *Manufacturing and compounding storage areas.* Raw materials, bulk materials awaiting further processing, and finished products which are controlled substances listed in any schedule shall be stored pursuant to federal laws and regulations.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.14(124) *Accountability of controlled substances.* The registrant shall maintain ultimate accountability of controlled substances and records maintained at the registered location.

10.14(1) *Records.* Pursuant to rule 657—10.36(124,155A), records shall be available for inspection and copying by the board or its authorized agents for two years from the date of the record.

10.14(2) *Policies and procedures.* The registrant shall have policies and procedures that identify, at a minimum:

- a.* Adequate storage for all controlled substances to ensure security and proper conditions with respect to temperature and humidity.
- b.* Access to controlled substances and records of controlled substances by employees of the registrant.
- c.* Proper disposition of controlled substances.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.15 Reserved.

657—10.16(124) Receipt and disbursement of controlled substances. Each transfer of a controlled substance between two registrants, to include a transfer between two separately registered locations regardless of any common ownership, except as provided in subrule 10.16(2), shall require a record of the transaction. Each registrant shall maintain a copy of the record for at least two years from the date of the transfer. Records of the transfer of Schedule II controlled substances shall be created and maintained separately from records of the transfer of Schedules III through V controlled substances pursuant to rule 657—10.36(124,155A). Upon receipt of a controlled substance, the individual responsible for receiving the controlled substance shall date and sign the receipt record.

10.16(1) Record. The record, unless otherwise provided in these rules or pursuant to federal law, shall include the following:

- a. The name of the substance.
- b. The strength and dosage form of the substance.
- c. The number of units or commercial containers acquired from other registrants, including the date of receipt and the name, address, and DEA registration number of the registrant from which the substances were acquired.
- d. The number of units or commercial containers distributed to other registrants, including the date of distribution and the name, address, and DEA registration number of the registrant to which the substances were distributed.
- e. The number of units or commercial containers disposed of in any other manner, including the date and manner of disposal and the name, address, and DEA registration number of the registrant to which the substances were distributed for disposal, if appropriate.

10.16(2) Distribution of samples and other complimentary packages. Complimentary packages and samples of controlled substances may be distributed to practitioners pursuant to federal and state law only if the person distributing the items provides to the practitioner a record that contains the information found in this subrule. The individual responsible for receiving the controlled substances shall sign and date the record.

- a. The name, address, and DEA registration number of the supplier.
- b. The name, address, and DEA registration number of the practitioner.
- c. The name, strength, dosage form, and quantity of the specific controlled substances delivered.
- d. The date of delivery.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.17(124) Ordering or distributing Schedule I or II controlled substances.

10.17(1) DEA Form 222. Except as otherwise provided by subrule 10.17(2) and under federal law, a DEA Form 222 is required for each distribution of a Schedule I or II controlled substance. An order form may be executed only on behalf of the registrant named on the order form and only if the registrant's DEA and Iowa registrations for the substances being purchased have not expired or been revoked or suspended by the issuing agency.

- a. Order forms shall be obtained, executed, and filled pursuant to DEA requirements. Each form shall be complete, legible, and properly prepared, executed, and endorsed and shall contain no alteration, erasure, or change of any kind.
- b. The purchaser shall submit Copy 1 and Copy 2 of the order form to the supplier.
- c. The purchaser shall maintain Copy 3 of the order form in the files of the registrant. Upon receipt of the substances from the supplier, the purchaser shall record on Copy 3 of the order form the quantity of each substance received and the date of receipt.
- d. The supplier shall record on Copy 1 and Copy 2 of the order form the quantity of each substance distributed to the purchaser and the date on which the shipment is made. The supplier shall maintain Copy 1 of the order form in the files of the supplier and shall forward Copy 2 of the order form to the DEA district office.
- e. Order forms shall be maintained separately from all other records of the registrant.
- f. Each unaccepted, defective, or otherwise void order form and any attached statement or other documents relating to any order form shall be maintained in the files of the registrant.

g. If the registration of any purchaser of Schedule I or II controlled substances is terminated for any reason, or if the name or address of the registrant as shown on the registration is changed, the registrant shall return all unused order forms to the DEA district office.

10.17(2) *Electronic ordering system.* A registrant authorized to order or distribute Schedule I or II controlled substances via the DEA Controlled Substances Ordering System (CSOS) shall comply with the requirements of the DEA relating to that system, including the maintenance and security of digital certificates, signatures, and passwords and all record-keeping and reporting requirements.

a. For an electronic order to be valid, the purchaser shall sign the electronic order with a digital signature issued to the purchaser or the purchaser's agent by the DEA.

b. An electronic order may include controlled substances that are not in Schedule I or II and may also include noncontrolled substances.

c. A purchaser shall submit an order to a specific wholesale distributor appropriately licensed to distribute in Iowa.

d. Prior to filling an order, a supplier shall verify the integrity of the signature and the order, verify that the digital certificate has not expired, check the validity of the certificate, and verify the registrant's authority to order the controlled substances.

e. The supplier shall retain an electronic record of every order, including a record of the number of commercial or bulk containers furnished for each item and the date on which the supplier shipped the containers to the purchaser. The shipping record shall be linked to the electronic record of the order. Unless otherwise provided under federal law, a supplier shall ship the controlled substances to the registered location associated with the digital certificate used to sign the order.

f. If an order cannot be filled for any reason, the supplier shall notify the purchaser and provide a statement as to the reason the order cannot be filled. When a purchaser receives such a statement from a supplier, the purchaser shall electronically link the statement of nonacceptance to the original electronic order. Neither a purchaser nor a supplier may correct a defective order; the purchaser must issue a new order for the order to be filled.

g. When a purchaser receives a shipment, the purchaser shall create a record of the quantity of each item received and the date received. The record shall be electronically linked to the original order and shall identify the individual reconciling the order. A purchaser shall, for each order filled, retain the original signed order and all linked records for that order for two years. The purchaser shall also retain all copies of each unfilled or defective order and each linked statement.

h. A supplier shall retain each original order filled and all linked records for two years. A supplier shall, for each electronic order filled, forward to the DEA within two business days either a copy of the electronic order or an electronic report of the order in a format specified by the DEA.

i. Records of CSOS electronic orders and all linked records shall be maintained by a supplier and a purchaser for two years following the date of shipment or receipt, respectively. Records may be maintained electronically or in hard-copy format. Records that are maintained electronically shall be readily retrievable from all other records, shall be easily readable or easily rendered into a readable format, shall be readily retrievable at the registered location, and shall be made available to the board, to the board's agents, or to the DEA upon request. Records maintained in hard-copy format shall be maintained in the same manner as DEA Form 222.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.18(124) Schedule II perpetual inventory. Each registrant located in Iowa that maintains Schedule II controlled substances shall maintain a perpetual inventory system for all Schedule II controlled substances pursuant to this rule. All records relating to the perpetual inventory shall be maintained at the registered location and shall be available for inspection and copying by the board or its representative for a period of two years from the date of the record.

10.18(1) *Record format.* The perpetual inventory record may be maintained in a manual or an electronic record format. Any electronic record shall provide for hard-copy printout of all transactions recorded in the perpetual inventory record for any specified period of time and shall state the current inventory quantities of each drug at the time the record is printed.

10.18(2) Information included. The perpetual inventory record shall identify all receipts for and disbursements of Schedule II controlled substances by drug or by national drug code (NDC) number. The record shall be updated to identify each receipt, disbursement, and current balance of each individual drug or NDC number. The record shall also include incident reports and reconciliation records pursuant to subrules 10.18(3) and 10.18(4).

10.18(3) Changes to a record. If a perpetual inventory record is able to be changed, the individual making a change to the record shall complete an incident report documenting the change. The incident report shall identify the specific information that was changed including the information before and after the change, shall identify the individual making the change, and shall include the date and the reason the record was changed. If the electronic record system documents within the perpetual inventory record all of the information that must be included in an incident report, a separate report is not required.

10.18(4) Reconciliation. The registrant shall be responsible for reconciling or ensuring the completion of a reconciliation of the perpetual inventory balance with the physical inventory of all Schedule II controlled substances at least annually. In case of any discrepancies between the physical inventory and the perpetual inventory, the registrant shall be notified immediately. The registrant shall determine the need for further investigation, and significant discrepancies shall be reported to the board pursuant to rule 657—10.21(124) and to the DEA pursuant to federal DEA regulations. Periodic reconciliation records shall be maintained and available for review and copying by the board or its authorized agents for a period of two years from the date of the record. The reconciliation process may be completed using either of the following procedures or a combination thereof:

a. The individual responsible for a disbursement verifies that the physical inventory matches the perpetual inventory following each disbursement and documents that reconciliation in the perpetual inventory record. If controlled substances are maintained on the patient care unit, the nurse or other responsible licensed health care provider verifies that the physical inventory matches the perpetual inventory following each dispensing and documents that reconciliation in the perpetual inventory record. If any Schedule II controlled substances in the registrant's current inventory have been disbursed and verified in this manner within the year and there are no discrepancies noted, no additional reconciliation action is required. A perpetual inventory record for a drug that has had no activity within the year shall be reconciled pursuant to paragraph 10.18(4) "b."

b. A physical count of each Schedule II controlled substance stocked by the registrant shall be completed at least once each year, and that count shall be reconciled with the perpetual inventory record balance. The physical count and reconciliation may be completed over a period of time not to exceed one year in a manner that ensures that the perpetual inventory and the physical inventory of Schedule II controlled substances are annually reconciled. The individual performing the reconciliation shall record the date, the time, the individual's initials or unique identification, and any discrepancies between the physical inventory and the perpetual inventory.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.19(124) Physical count and record of inventory. Each registrant shall be responsible for taking a complete and accurate inventory of all stocks of controlled substances under the control of the registrant pursuant to this rule. The responsible individual may delegate the actual taking of any inventory.

10.19(1) Record and procedure. Each inventory record, except the periodic count and reconciliation required pursuant to subrule 10.18(4), shall comply with the requirements of this subrule and shall be maintained for a minimum of two years from the date of the inventory.

a. Each inventory shall contain a complete and accurate record of all controlled substances on hand on the date and at the time the inventory is taken.

b. Each inventory shall be maintained in a handwritten, typewritten, or electronically printed form at the registered location. An inventory of Schedule II controlled substances shall be maintained separately from an inventory of all other controlled substances.

c. Controlled substances shall be deemed to be on hand if they are in the possession of or under the control of the registrant. Controlled substances on hand shall include prescriptions prepared for

dispensing to a patient but not yet delivered to the patient, substances maintained in emergency medical service programs, care facility or hospice emergency supplies, outdated or adulterated substances pending destruction, and substances stored in a warehouse on behalf of the registrant. Controlled substances obtained through an authorized collection program for the purpose of disposal shall not be examined, inspected, counted, sorted, inventoried, or otherwise handled.

d. A separate inventory shall be made for each registered location and for each independent activity registered except as otherwise provided under federal law.

e. The inventory shall be taken either prior to opening or following the close of business on the inventory date, and the inventory record shall identify either opening or close of business.

f. The inventory record, unless otherwise provided under federal law, shall include the following information:

(1) The name of the substance.

(2) The strength and dosage form of the substance.

(3) The quantity of the substance.

(4) Information required of authorized collection programs pursuant to federal regulations for such collection programs.

(5) The signature of the person or persons responsible for taking the inventory.

(6) The date and time (opening or closing) of the inventory.

g. For all substances listed in Schedule I or II, the quantity shall be an exact count or measure of the substance.

h. For all substances listed in Schedule III, IV, or V, the quantity may be an estimated count or measure of the substance unless the container has been opened and originally held more than 100 dosage units. If the opened commercial container originally held more than 100 dosage units, an exact count of the contents shall be made. Products packaged in nonincremented containers may be estimated to the nearest one-fourth container.

10.19(2) *Initial inventory.* A new registrant shall take an inventory of all stocks of controlled substances on hand on the date the new registrant first engages in the manufacture, distribution, storage, or dispensing of controlled substances. If the registrant commences business or the registered activity with no controlled substances on hand, the initial inventory shall record that fact.

10.19(3) *Annual inventory.* After the initial inventory is taken, a registrant shall take a new inventory of all stocks of controlled substances on hand at least annually. The annual inventory may be taken on any date that is within 372 days after the date of the previous annual inventory.

10.19(4) *Change of ownership, pharmacist in charge, or registered location.* When there is a change in ownership, pharmacist in charge, or location for a registration, an inventory shall be taken of all controlled substances in compliance with subrule 10.19(1). The inventory shall be taken following the close of business the last day under terminating ownership, terminating pharmacist in charge's employment, or at the location being vacated. The inventory shall serve as the ending inventory for the terminating owner, terminating pharmacist in charge, or location being vacated, as well as a record of the beginning inventory for the new owner, pharmacist in charge, or location.

10.19(5) *Discontinuing registered activity.* A registrant shall take an inventory of controlled substances at the close of business the last day the registrant is engaged in registered activities. If the registrant is selling or transferring the remaining controlled substances to another registrant, this inventory shall serve as the ending inventory for the registrant discontinuing business as well as a record of additional or starting inventory for the registrant to which the substances are transferred.

10.19(6) *New or rescheduled controlled substances.* On the effective date of the addition of a previously noncontrolled substance to any schedule of controlled substances or the rescheduling of a previously controlled substance to another schedule, any registrant who possesses the newly scheduled or rescheduled controlled substance shall take an inventory of all stocks of the substance on hand. That inventory record shall be maintained with the most recent controlled substances inventory record. Thereafter, the controlled substance shall be included in the appropriate schedule of each inventory made by the registrant.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.20 Reserved.

657—10.21(124) Report of theft or loss. A registrant shall report to the board and the DEA any theft or significant loss of controlled substances when the loss is attributable to other than inadvertent error. Thefts or other losses of controlled substances shall be reported whether or not the controlled substances are subsequently recovered or the responsible parties are identified and action taken against them.

10.21(1) Immediate notice to board. If the theft was committed by a registrant or licensee of the board, or if there is reason to believe that the theft was committed by a registrant or licensee of the board, the registrant from which the controlled substances were stolen shall notify the board immediately upon discovery of the theft and shall identify to the board the registrant or licensee suspected of the theft.

10.21(2) Immediate notice to DEA. A registrant shall deliver notice, immediately upon discovery of a reportable theft or loss of controlled substances, to the Des Moines DEA field office via telephone, facsimile, or a brief written message explaining the circumstances of the theft or loss.

10.21(3) Timely report submission. Within 14 calendar days of discovery of the theft or loss, a registrant shall submit directly to the DEA a Form 106 or alternate required form via the DEA website at www.deadiversion.usdoj.gov/. A copy of the report that was completed and submitted to the DEA shall be immediately submitted to the board via facsimile, email attachment, or personal or commercial delivery.

10.21(4) Record maintained. A copy of the report shall be maintained in the registrant's files for a minimum of two years following the date the report was completed.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.22(124) Disposal of registrant stock. A registrant shall dispose of controlled substances pursuant to the requirements of this rule. Disposal records shall be maintained by the registrant for at least two years from the date of the record.

10.22(1) Registrant stock supply. Controlled substances shall be removed from current inventory and disposed of by one of the following procedures.

a. The registrant shall utilize the services of a DEA-registered and Iowa-licensed reverse distributor.

b. The board may authorize and instruct the registrant to dispose of the controlled substances in one of the following manners:

(1) By delivery to an agent of the board or to the board office.

(2) By destruction of the drugs in the presence of a board officer, agent, inspector, or other authorized individual.

(3) By such other means as the board may determine to ensure that drugs do not become available to unauthorized persons.

10.22(2) Waste resulting from administration or compounding. Except as otherwise specifically provided by federal or state law or rules of the board, the unused portion of a controlled substance resulting from administration to a patient from a registrant's stock or emergency supply or resulting from drug compounding operations may be destroyed or otherwise disposed of by the registrant or a pharmacist in witness of one other licensed health care provider or a registered pharmacy technician 18 years of age or older pursuant to this subrule. A written record of the wastage shall be made and maintained by the registrant for a minimum of two years following the wastage. The record shall include the following:

a. The controlled substance wasted.

b. The date of wastage.

c. The quantity or estimated quantity of the wasted controlled substance.

d. The source of the controlled substance, including identification of the patient to whom the substance was administered or the drug compounding process utilizing the controlled substance.

e. The reason for the waste.

f. The signatures of both individuals involved in the wastage.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.23(124) Disposal of previously dispensed controlled substances. Except as provided in 657—Chapter 23 for care facilities, a registrant may not dispose of previously dispensed controlled substances unless the registrant has modified its registration with DEA to administer an authorized collection program. A registrant shall not take possession of a previously dispensed controlled substance except for reuse for the same patient.
[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.24(124,126,155A) Prescription requirements. All prescriptions for controlled substances shall be dated as of, and signed on, the day issued. Controlled substances prescriptions shall be valid for six months following date of issue. A prescription for a Schedule III, IV, or V controlled substance may include authorization to refill the prescription no more than five times within the six months following date of issue. A prescription for a Schedule II controlled substance shall not be refilled.

10.24(1) Form of prescription. All prescriptions for controlled substances shall bear the full name and address of the patient; the drug name, strength, dosage form, quantity prescribed, and directions for use; and the name, address, and DEA registration number of the prescriber. All prescriptions for controlled substances issued by individual prescribers shall include the legibly preprinted, typed, or hand-printed name of the prescriber as well as the prescriber's written or electronic signature.

a. When an oral order is not permitted, or when a prescriber is unable to prepare and transmit an electronic prescription in compliance with DEA requirements for electronic prescriptions, prescriptions shall be written with ink, indelible pencil, or typed print and shall be manually signed by the prescriber. If the prescriber utilizes an electronic prescription application that meets DEA requirements for electronic prescriptions, the prescriber may electronically prepare and transmit a prescription for a controlled substance to a pharmacy that utilizes a pharmacy prescription application that meets DEA requirements for electronic prescriptions.

b. A prescriber's agent may prepare a prescription for the review, authorization, and manual or electronic signature of the prescriber, but the prescribing practitioner is responsible for the accuracy, completeness, and validity of the prescription.

c. An electronic prescription for a controlled substance shall not be transmitted to a pharmacy except by the prescriber in compliance with DEA regulations.

d. A prescriber shall securely maintain the unique authentication credentials issued to the prescriber for utilization of the electronic prescription application and authentication of the prescriber's electronic signature. Unique authentication credentials issued to any individual shall not be shared with or disclosed to any other prescriber, agent, or individual.

e. A corresponding liability rests upon the pharmacist who fills a prescription not prepared in the form prescribed by this rule.

10.24(2) Verification by pharmacist. The pharmacist shall verify the authenticity of the prescription with the individual prescriber or the prescriber's agent in each case when a written or oral prescription for a Schedule II controlled substance is presented for filling and neither the prescribing individual practitioner issuing the prescription nor the patient or patient's agent is known to the pharmacist. The pharmacist shall verify the authenticity of the prescription with the individual prescriber or the prescriber's agent in any case when the pharmacist questions the validity of, including the legitimate medical purpose for, the prescription. The pharmacist is required to record the manner by which the prescription was verified and include the pharmacist's name or unique identifier.

10.24(3) Intern, resident, foreign physician. An intern, resident, or foreign physician exempt from registration pursuant to subrule 10.8(5) shall include on all prescriptions issued the hospital's registration number and the special internal code number assigned by the hospital in lieu of the prescriber's registration number required by this rule. Each prescription shall include the stamped or legibly printed name of the prescribing intern, resident, or foreign physician as well as the prescriber's signature.

10.24(4) Valid prescriber/patient relationship. Once the prescriber/patient relationship is broken and the prescriber is no longer available to treat the patient or to oversee the patient's use of the controlled substance, a prescription shall lose its validity. A prescriber/patient relationship shall be deemed broken

when the prescriber dies, retires, or moves out of the local service area or when the prescriber's authority to prescribe is suspended, revoked, or otherwise modified to exclude authority for the schedule in which the prescribed substance is listed. The pharmacist, upon becoming aware of the situation, shall cancel the prescription and any remaining refills. However, the pharmacist shall exercise prudent judgment based upon individual circumstances to ensure that the patient is able to obtain a sufficient amount of the drug to continue treatment until the patient can reasonably obtain the service of another prescriber and a new prescription can be issued.

10.24(5) *Facsimile transmission of a controlled substance prescription.* With the exception of an authorization for emergency dispensing as provided in rule 657—10.26(124), a prescription for a controlled substance in Schedules II, III, IV and V may be transmitted via facsimile from a prescriber to a pharmacy only as provided in rule 657—21.9(124,155A).

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.25(124) Dispensing records. Each registrant shall create a record of controlled substances dispensed to a patient or research subject.

10.25(1) *Record maintained and available.* The record shall be maintained for two years from the date of dispensing and be available for inspection and copying by the board or its authorized agents.

10.25(2) *Record contents.* The record shall include the following information:

- a. The name and address of the person to whom dispensed.
- b. The date of dispensing.
- c. The name or NDC number, strength, dosage form, and quantity of the substance dispensed.
- d. The name of the prescriber, unless dispensed by the prescriber.
- e. The unique identification of each technician, pharmacist, pharmacist-intern, prescriber, or prescriber's agent involved in dispensing.
- f. The serial number or unique identification number of the prescription.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.26(124) Schedule II emergency prescriptions.

10.26(1) *Emergency situation defined.* For the purposes of authorizing an oral or facsimile transmission of a prescription for a Schedule II controlled substance listed in Iowa Code section 124.206, the term "emergency situation" means those situations in which the prescribing practitioner determines that all of the following apply:

- a. Immediate administration of the controlled substance is necessary for proper treatment of the intended ultimate user.
- b. No appropriate alternative treatment is available, including administration of a drug that is not a Schedule II controlled substance.
- c. It is not reasonably possible for the prescribing practitioner to provide a manually signed written prescription to be presented to the pharmacy before the pharmacy dispenses the controlled substance, or the prescribing practitioner is unable to provide a DEA-compliant electronic prescription to the pharmacy before the pharmacy dispenses the controlled substance.

10.26(2) *Requirements of emergency prescription.* In the case of an emergency situation as defined in subrule 10.26(1), a pharmacist may dispense a controlled substance listed in Schedule II pursuant to a facsimile transmission or upon receiving oral authorization of a prescribing individual practitioner provided that:

- a. The quantity prescribed and dispensed is limited to the smallest available quantity to meet the needs of the patient during the emergency period. Dispensing beyond the emergency period requires a written prescription manually signed by the prescribing individual practitioner or a DEA-compliant electronic prescription.
- b. If the pharmacist does not know the prescribing individual practitioner, the pharmacist shall make a reasonable effort to determine that the authorization came from an authorized prescriber. The pharmacist shall record the manner by which the authorization was verified and include the pharmacist's name or unique identification.

c. The pharmacist shall prepare a temporary written record of the emergency prescription. The temporary written record shall consist of a hard copy of the facsimile transmission or a written record of the oral transmission authorizing the emergency dispensing. A written record is not required to consist of a handwritten record and may be a printed facsimile or a print of a computer-generated record of the prescription if the printed record includes all of the required elements for the prescription. If the emergency prescription is transmitted by the practitioner's agent, the record shall include the first and last names and title of the individual who transmitted the prescription.

d. If the emergency prescription is transmitted via facsimile transmission, the means of transmission shall not obscure or render the prescription information illegible due to security features of the paper utilized by the prescriber to prepare the written prescription, and the hard-copy record of the facsimile transmission shall not be obscured or rendered illegible due to such security features.

e. Within seven days after authorizing an emergency prescription, the prescribing individual practitioner shall cause a written prescription for the emergency quantity prescribed to be delivered to the dispensing pharmacist. In addition to conforming to the requirements of rule 657—10.24(124,126,155A), the prescription shall have written on its face "Authorization for Emergency Dispensing" and the date of the emergency order. The written prescription may be delivered to the pharmacist in person or by mail, but if delivered by mail it must be postmarked within the seven-day period. The written prescription shall be attached to and maintained with the temporary written record prepared pursuant to paragraph 10.26(2)"c."

f. The pharmacist shall notify the board and the DEA if the prescribing individual fails to deliver a written prescription. Failure of the pharmacist to so notify the board and the DEA, or failure of the prescribing individual to deliver the required written prescription as herein required, shall void the authority conferred by this subrule.

g. Pursuant to federal law and subrule 10.27(3), the pharmacist may fill a partial quantity of an emergency prescription so long as the total quantity dispensed in all partial fillings does not exceed the total quantity prescribed and that the remaining portions are filled no later than 72 hours after the prescription is issued.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.27(124) Schedule II prescriptions—partial filling. The partial filling of a prescription for a controlled substance listed in Schedule II is permitted as provided in this rule and federal regulations.

10.27(1) *Insufficient supply on hand.* If the pharmacist is unable to supply the full quantity authorized in a prescription and makes a notation of the quantity supplied on the prescription record, a partial fill of the prescription is permitted. The remaining portion of the prescription must be filled within 72 hours of the first partial filling. If the remaining portion is not or cannot be filled within the 72-hour period, the pharmacist shall so notify the prescriber. No further quantity may be supplied beyond 72 hours without a new prescription.

10.27(2) *Long-term care or terminally ill patient.* A prescription for a Schedule II controlled substance written for a patient in a long-term care facility (LTCF) or for a patient with a medical diagnosis documenting a terminal illness may be filled in partial quantities to include individual dosage units as provided by this subrule.

a. If there is any question whether a patient may be classified as having a terminal illness, the pharmacist shall contact the practitioner prior to partially filling the prescription. Both the pharmacist and the practitioner have a corresponding responsibility to ensure that the controlled substance is for a terminally ill patient.

b. The pharmacist shall record on the prescription whether the patient is "terminally ill" or an "LTCF patient." For each partial filling, the dispensing pharmacist shall record on the back of the prescription or on another appropriate uniformly maintained and readily retrievable record, the date of the partial filling, the quantity dispensed, the remaining quantity authorized to be dispensed, and the identification of the dispensing pharmacist.

c. The total quantity of Schedule II controlled substances dispensed in all partial fillings shall not exceed the total quantity prescribed. Schedule II prescriptions for patients in an LTCF or for patients

with a medical diagnosis documenting a terminal illness shall be valid for a period not to exceed 60 days from the issue date unless sooner terminated by the discontinuance of the drug.

d. Information pertaining to current Schedule II prescriptions for patients in an LTCF or for patients with a medical diagnosis documenting a terminal illness may be maintained in a computerized system pursuant to rule 657—21.4(124,155A).

10.27(3) Patient or prescriber request. At the request of the patient or prescriber, a prescription for a Schedule II controlled substance may be partially filled pursuant to this subrule and federal law. The total quantity dispensed in all partial fillings shall not exceed the total quantity prescribed. Except as provided in paragraph 10.26(2) “g,” the remaining portion of a prescription partially filled pursuant to this subrule may be filled within 30 days of the date the prescription was issued.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.28(124) Schedule II medication order. Schedule II controlled substances may be administered or dispensed to institutionalized patients pursuant to a medication order as provided in 657—subrule 7.13(1) or rule 657—23.18(124,155A), as applicable.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.29(124) Schedule II—issuing multiple prescriptions. An individual prescriber may issue multiple prescriptions authorizing the patient to receive a total of up to a 90-day supply of a Schedule II controlled substance pursuant to the provisions and limitations of this rule.

10.29(1) Refills prohibited. The issuance of refills for a Schedule II controlled substance is prohibited. The use of multiple prescriptions for the dispensing of Schedule II controlled substances, pursuant to this rule, ensures that the prescriptions are treated as separate dispensing authorizations and not as refills of an original prescription.

10.29(2) Legitimate medical purpose. Each separate prescription issued pursuant to this rule shall be issued for a legitimate medical purpose by an individual prescriber acting in the usual course of the prescriber’s professional practice.

10.29(3) Dates and instructions. Each prescription issued pursuant to this rule shall be dated as of and manually signed by the prescriber on the day the prescription is issued. Each separate prescription, other than the first prescription if that prescription is intended to be filled immediately, shall contain written instructions indicating the earliest date on which a pharmacist may fill each prescription.

10.29(4) Authorized fill date unalterable. Regardless of the provisions of rule 657—10.30(124), when a prescription contains instructions from the prescriber indicating that the prescription shall not be filled before a certain date, a pharmacist shall not fill the prescription before that date. The pharmacist shall not contact the prescriber for verbal authorization to fill the prescription before the fill date originally indicated by the prescriber pursuant to this rule.

10.29(5) Number of prescriptions and authorized quantity. An individual prescriber may issue for a patient as many separate prescriptions, to be filled sequentially pursuant to this rule, as the prescriber deems necessary to provide the patient with adequate medical care. The cumulative effect of the filling of each of these separate prescriptions shall result in the receipt by the patient of a quantity of the Schedule II controlled substance not exceeding a 90-day supply.

10.29(6) Prescriber’s discretion. Nothing in this rule shall be construed as requiring or encouraging an individual prescriber to issue multiple prescriptions pursuant to this rule or to see the prescriber’s patients once every 90 days when prescribing Schedule II controlled substances. An individual prescriber shall determine, based on sound medical judgment and in accordance with established medical standards, how often to see patients and whether it is appropriate to issue multiple prescriptions pursuant to this rule.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.30(124) Schedule II—changes to a prescription. With appropriate verification, a pharmacist may add information provided by the patient or patient’s agent, such as the patient’s address, to a Schedule II controlled substance prescription.

10.30(1) *Changes prohibited.* A pharmacist shall never change the patient's name, the controlled substance prescribed except for generic substitution, or the name or signature of the prescriber.

10.30(2) *Changes authorized.* After consultation with the prescriber or the prescriber's agent and documentation of such consultation, a pharmacist may change or add the following information on a Schedule II controlled substance prescription:

- a. The drug strength.
 - b. The dosage form.
 - c. The drug quantity.
 - d. The directions for use.
 - e. The date the prescription was issued.
 - f. The prescriber's address or DEA registration number.
 - g. The name of the supervising prescriber if the prescription was issued by a physician assistant.
- [ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.31 Reserved.

657—10.32(124) Schedule III, IV, or V prescription. No prescription for a controlled substance listed in Schedule III, IV, or V shall be filled or refilled more than six months after the date on which it was issued nor be refilled more than five times.

10.32(1) *Record.* Each filling and refilling of a prescription shall be entered in a uniformly maintained and readily retrievable record in accordance with rule 657—10.25(124). If the pharmacist merely initials or affixes the pharmacist's unique identifier and dates the back of the prescription, it shall be deemed that the full face amount of the prescription has been dispensed.

10.32(2) *Oral refill authorization.* The prescribing practitioner may authorize additional refills of Schedule III, IV, or V controlled substances on the original prescription through an oral refill authorization transmitted to an authorized individual at the pharmacy provided the following conditions are met:

- a. The total quantity authorized, including the amount of the original prescription, does not exceed five refills nor extend beyond six months from the date of issuance of the original prescription.
- b. The pharmacist, pharmacist-intern, or technician who obtains the oral authorization from the prescriber who issued the original prescription documents, on or with the original prescription, the date authorized, the quantity of each refill, the number of additional refills authorized, and the unique identification of the authorized individual.
- c. The quantity of each additional refill is equal to or less than the quantity authorized for the initial filling of the original prescription.
- d. The prescribing practitioner must execute a new and separate prescription for any additional quantities beyond the five-refill, six-month limitation.

10.32(3) *Partial fills.* The partial filling of a prescription for a controlled substance listed in Schedule III, IV, or V is permissible provided that each partial fill is recorded in the same manner as a refill pursuant to subrule 10.32(1). The total quantity dispensed in all partial fills shall not exceed the total quantity prescribed.

10.32(4) *Medication order.* A Schedule III, IV, or V controlled substance may be administered or dispensed to institutionalized patients pursuant to a medication order as provided in 657—subrule 7.13(1) or rule 657—23.9(124,155A), as applicable.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.33(124,155A) Dispensing Schedule V controlled substances without a prescription. A controlled substance listed in Schedule V, which substance is not a prescription drug as determined under the federal Food, Drug, and Cosmetic Act, and excepting products containing ephedrine, pseudoephedrine, or phenylpropanolamine, may be dispensed or administered without a prescription by a pharmacist to a purchaser at retail pursuant to the conditions of this rule.

10.33(1) *Who may dispense.* Dispensing shall be by a licensed Iowa pharmacist or by a registered pharmacist-intern under the direct supervision of a pharmacist preceptor. This subrule does not prohibit,

after the pharmacist has fulfilled the professional and legal responsibilities set forth in this rule and has authorized the dispensing of the substance, the completion of the actual cash or credit transaction or the delivery of the substance by a nonpharmacist.

10.33(2) Frequency and quantity. Dispensing at retail to the same purchaser in any 48-hour period shall be limited to no more than one of the following quantities of a Schedule V controlled substance:

- a. 240 cc (8 ounces) of any controlled substance containing opium.
- b. 120 cc (4 ounces) of any other controlled substance.
- c. 48 dosage units of any controlled substance containing opium.
- d. 24 dosage units of any other controlled substance.

10.33(3) Age of purchaser. The purchaser shall be at least 18 years of age.

10.33(4) Identification. The pharmacist shall require every purchaser under this rule who is not known by the pharmacist to present a government-issued photo identification, including proof of age when appropriate.

10.33(5) Record. A bound record book (i.e., with pages sewn or glued to the spine) for dispensing of Schedule V controlled substances pursuant to this rule shall be maintained by the pharmacist. The book shall contain the name and address of each purchaser, the name and quantity of controlled substance purchased, the date of each purchase, and the name or unique identification of the pharmacist or pharmacist-intern who approved the dispensing of the substance to the purchaser.

10.33(6) Prescription not required under other laws. No other federal or state law or regulation requires a prescription prior to distributing or dispensing the Schedule V controlled substance.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.34(124) Dispensing products containing ephedrine, pseudoephedrine, or phenylpropanolamine without a prescription. A product containing ephedrine, pseudoephedrine, or phenylpropanolamine, which substance is a Schedule V controlled substance and is not listed in another controlled substance schedule, may be dispensed or administered without a prescription by a pharmacist, pharmacist-intern, or certified pharmacy technician to a purchaser at retail pursuant to the conditions of this rule.

10.34(1) Who may dispense. Dispensing shall be by a licensed Iowa pharmacist, by a registered pharmacist-intern under the direct supervision of a pharmacist preceptor, or by a registered certified pharmacy technician under the direct supervision of a pharmacist, except as authorized in 657—Chapter 100. This subrule does not prohibit, after the pharmacist, pharmacist-intern, or certified pharmacy technician has fulfilled the professional and legal responsibilities set forth in this rule and has authorized the dispensing of the substance, the completion of the actual cash or credit transaction or the delivery of the substance by another pharmacy employee.

10.34(2) Packaging of nonliquid forms. A nonliquid form of a product containing ephedrine, pseudoephedrine, or phenylpropanolamine includes gel caps. Nonliquid forms of these products to be sold pursuant to this rule shall be packaged either in blister packaging with each blister containing no more than two dosage units or, if blister packs are technically infeasible, in unit dose packets or pouches.

10.34(3) Frequency and quantity. Dispensing without a prescription to the same purchaser within any 30-day period shall be limited to products collectively containing no more than 7,500 mg of ephedrine, pseudoephedrine, or phenylpropanolamine; dispensing without a prescription to the same purchaser within a single calendar day shall not exceed 3,600 mg.

10.34(4) Age of purchaser. The purchaser shall be at least 18 years of age.

10.34(5) Identification. The pharmacist, pharmacist-intern, or certified pharmacy technician shall require every purchaser under this rule to present a current government-issued photo identification, including proof of age when appropriate. The pharmacist, pharmacist-intern, or certified pharmacy technician shall be responsible for verifying that the name on the identification matches the name provided by the purchaser and that the photo image depicts the purchaser.

10.34(6) Record. Purchase records shall be recorded in the real-time electronic pseudoephedrine tracking system (PTS) established and administered by the governor's office of drug control policy

pursuant to 657—Chapter 100. If the PTS is unavailable for use, the purchase record shall be recorded in an alternate format and submitted to the PTS as provided in 657—subrule 100.3(4).

a. Alternate record contents. The alternate record shall contain the following:

- (1) The name, address, and signature of the purchaser.
- (2) The name and quantity of the product purchased, including the total milligrams of ephedrine, pseudoephedrine, or phenylpropanolamine contained in the product.
- (3) The date and time of the purchase.
- (4) The name or unique identification of the pharmacist, pharmacist-intern, or certified pharmacy technician who approved the dispensing of the product.

b. Alternate record format. The record shall be maintained using one of the following options:

- (1) A hard-copy record.
- (2) A record in the pharmacy's electronic prescription dispensing record-keeping system that is capable of producing a hard-copy printout of a record.
- (3) A record in an electronic data collection system that captures each of the data elements required by this subrule and that is capable of producing a hard-copy printout of a record.

c. PTS records retrieval. Pursuant to 657—subrule 100.4(6), the pharmacy shall be able to produce a hard-copy printout of transactions recorded in the PTS by the pharmacy for one or more specific products for a specified period of time upon request by the board or its representative or to such other persons or governmental agencies authorized by law to receive such information.

10.34(7) Notice required. The pharmacy shall ensure that the following notice is provided to purchasers of ephedrine, pseudoephedrine, or phenylpropanolamine products and that the notice is displayed with or on the electronic signature device or is displayed in the dispensing area and visible to the public:

“Warning: Section 1001 of Title 18, United States Code, states that whoever, with respect to the logbook, knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes any materially false, fictitious, or fraudulent statement or representation, or makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry, shall be fined not more than \$250,000 if an individual or \$500,000 if an organization, imprisoned not more than five years, or both.”

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.35 Reserved.

657—10.36(124,155A) Records. Every record required to be kept under this chapter or under Iowa Code chapter 124 shall be kept by the registrant and be available for inspection and copying by the board or its representative for at least two years from the date of such record except as otherwise required in these rules. Controlled substances records shall be maintained in a readily retrievable manner that establishes the receipt and distribution of all controlled substances. Original records more than 12 months old may be maintained in a secure remote storage area unless such remote storage is prohibited under federal law. If the secure storage area is not located within the same physical structure as the registrant, the records must be retrievable within 48 hours of a request by the board or its authorized agent.

10.36(1) Schedule I and II records. Records of controlled substances listed in Schedules I and II shall be maintained separately from all other records of the registrant.

10.36(2) Schedule III, IV, and V records. Records of controlled substances listed in Schedules III, IV, and V shall be maintained either separately from all other records of the registrant or in such form that the required information is readily retrievable from the ordinary business records of the registrant.

10.36(3) Date of record. The date on which a controlled substance is actually received, imported, distributed, exported, disposed of, or otherwise transferred shall be used as the date of receipt, importation, distribution, exportation, disposal, or transfer.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.37 Reserved.

657—10.38(124) Revision of controlled substances schedules.

10.38(1) *Designation of new controlled substance.* The board may designate any new substance as a controlled substance to be included in any of the schedules in Iowa Code chapter 124 no sooner than 30 days following publication in the Federal Register of a final order so designating the substance under federal law. Designation of a new controlled substance under this subrule shall be temporary as provided in Iowa Code section 124.201(4).

10.38(2) *Objection to designation of a new controlled substance.* The board may object to the designation of any new substance as a controlled substance within 30 days following publication in the Federal Register of a final order so designating the substance under federal law. The board shall file objection to the designation of a substance as controlled, shall afford all interested parties an opportunity to be heard, and shall issue the board's decision on the new designation as provided in Iowa Code section 124.201(4).

10.38(3) *Cannabidiol investigational product.* If a cannabidiol investigational product approved as a prescription drug medication by the United States Food and Drug Administration is eliminated from or revised in the federal schedule of controlled substances by the DEA and notice of the elimination or revision is given to the board, the board shall similarly eliminate or revise the prescription drug medication in the schedule of controlled substances. Such action by the board shall be immediately effective upon the date of publication of the final regulation containing the elimination or revision in the Federal Register.

[ARC 3345C, IAB 9/27/17, effective 11/1/17; ARC 3743C, IAB 4/11/18, effective 5/16/18]

657—10.39(124) Temporary designation of controlled substances.

10.39(1) Amend Iowa Code section 124.206(7) by adding the following new paragraph "c":

c. Dronabinol [(-)-delta-9-trans-tetrahydrocannabinol] in an oral solution in a drug product approved for marketing by the U.S. Food and Drug Administration.

10.39(2) Amend Iowa Code section 124.204(9) by adding the following new paragraphs:

t. Methyl 2-(1-(5-fluoropentyl)-1H-indazole-3-carboxamido)-3,3-dimethylbutanoate, its optical, positional, and geometric isomers, salts and salts of isomers. Other names: 5F-ADB; 5F-MDMB-PINACA.

u. Methyl 2-(1-(5-fluoropentyl)-1H-indazole-3-carboxamido)-3-methylbutanoate, its optical, positional, and geometric isomers, salts and salts of isomers. Other name: 5F-AMB.

v. N-(adamantan-1-yl)-1-(5-fluoropentyl)-1H-indazole-3-carboxamide, its optical, positional, and geometric isomers, salts and salts of isomers. Other names: 5F-APINACA, 5F-AKB48.

w. N-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(4-fluorobenzyl)-1H-indazole-3-carboxamide, its optical, positional, and geometric isomers, salts and salts of isomers. Other name: ADB-FUBINACA.

x. Methyl 2-(1-(cyclohexylmethyl)-1H-indole-3-carboxamido)-3,3-dimethylbutanoate, its optical, positional, and geometric isomers, salts and salts of isomers. Other names: MDMB-CHMICA, MMB-CHMINACA.

y. Methyl 2-(1-(4-fluorobenzyl)-1H-indazole-3-carboxamido)-3,3-dimethylbutanoate, its optical, positional, and geometric isomers, salts and salts of isomers. Other name: MDMB-FUBINACA.

z. N-(4-fluorophenyl)-N-(1-phenethylpiperidin-4-yl)isobutyramide, its isomers, esters, ethers, salts and salts of isomers, esters and ethers. Other names: 4-fluoroisobutyryl fentanyl, para-fluoroisobutyryl fentanyl.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.40(124) Excluded and exempt substances. The Iowa board of pharmacy hereby excludes from all schedules the current list of "Excluded Nonnarcotic Products" identified in Title 21, CFR Part 1308, Section 22, and the list of "Exempted Prescription Products" described in Title 21, CFR Part 1308, Section 32. Copies of such lists may be obtained by written request to the board office at 400 S.W. Eighth Street, Suite E, Des Moines, Iowa 50309-4688.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.41(124) Anabolic steroid defined. Anabolic steroid, as defined in Iowa Code section 126.2(2), includes any substance identified as such in Iowa Code section 124.208(6) or 126.2(2).
[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.42 Reserved.

657—10.43(124) Reporting discipline and criminal convictions. A registrant shall provide written notice to the board of any disciplinary or enforcement action imposed by any licensing or regulatory authority on any license or registration held by the registrant no later than 30 days after the final action. Discipline may include, but is not limited to, fine or civil penalty, citation or reprimand, probationary period, suspension, revocation, and voluntary surrender. A registrant shall provide written notice to the board of any criminal conviction of the registrant or of any owner that is related to the operation of the registered location no later than 30 days after the conviction. The term criminal conviction includes instances when the judgment of conviction or sentence is deferred.
[ARC 3345C, IAB 9/27/17, effective 11/1/17]

657—10.44(124) Discipline. Pursuant to 657—Chapter 36, the board may fine, suspend, revoke, or impose other disciplinary sanctions on a registration for any of the following:

1. Any violation of the federal Food, Drug, and Cosmetic Act or federal regulations promulgated under the Act.
2. Any conviction of a crime related to controlled substances committed by the registrant, or if the registrant is an association, joint stock company, partnership, or corporation, by any managing officer.
3. Refusing access to the registered location or registrant records to an agent of the board for the purpose of conducting an inspection or investigation.
4. Failure to maintain registration pursuant to 657—Chapter 10.
5. Any violation of Iowa Code chapters 124, 124A, 124B, 126, 155A, or 205, or any rule of the board, including the disciplinary grounds set forth in 657—Chapter 36.

[ARC 3345C, IAB 9/27/17, effective 11/1/17]

These rules are intended to implement Iowa Code sections 124.201, 124.301 to 124.308, 124.402, 124.403, 124.501, 126.2, 126.11, 147.88, 155A.13, 155A.17, 155A.26, 155A.37, and 205.3.

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⁰ Two or more ARCs

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CHAPTER 37
IOWA PRESCRIPTION MONITORING PROGRAM

657—37.1(124) Purpose. These rules establish a prescription monitoring program that compiles a central database of reportable prescriptions dispensed to patients in Iowa. An authorized health care practitioner may, but is not required to, access prescription monitoring program (PMP) information regarding the practitioner's patient to assist in determining appropriate treatment options and to improve the quality of patient care. The PMP is intended to provide a health care practitioner with a resource for information regarding a patient's use of controlled substances. This database will assist the practitioner in identifying any potential diversion, misuse, or abuse of controlled substances without impeding the appropriate medical use of controlled substances.

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657—37.2(124) Definitions. As used in this chapter:

"Board" means the Iowa board of pharmacy.

"Controlled substance" means a drug, substance, or immediate precursor in Schedules I through V set forth in Iowa Code chapter 124, division II.

"Council" means the PMP advisory council established pursuant to Iowa Code section 124.555 to provide oversight and to co-manage PMP activities with the board.

"Database information" or *"PMP information"* means information submitted to and maintained by the PMP database.

"DEA number" means the registration number issued to an individual or pharmacy by the U.S. Department of Justice, Drug Enforcement Administration (DEA) authorizing the individual or pharmacy to engage in the prescribing, dispensing, distributing, or procuring of a controlled substance.

"Dispenser" means a person who delivers to the ultimate user a substance required to be reported to the PMP database. "Dispenser" includes a pharmacy located outside the state of Iowa that is licensed by the board with a nonresident pharmacy license authorizing the pharmacy to dispense prescription drugs to patients physically located in Iowa. "Dispenser" does not include a person exempt from reporting pursuant to subrule 37.3(1).

"Electronic health record system" or *"EHRS"* means a real-time, patient-centered health record system that makes patient health information and other health care tools and resources readily and securely available to authorized providers in a digital format capable of being shared with other providers across one or more health care organizations or facilities.

"Electronic pharmacy information system" or *"e-pharmacy system"* means a real-time electronic patient prescription record system that includes, at a minimum, patient profiles and prescription dispensing information and that may enable shared access to included information by multiple pharmacies, such as a chain of pharmacies using the same e-pharmacy system.

"Electronic system" means an electronic health record system, an electronic pharmacy information system, or a health information exchange. "Electronic systems" refers to a combination of two or more of these types of systems.

"Health care professional" means a person who, by education, training, certification, or licensure, is qualified to provide and is engaged in providing health care to patients. "Health care professional" does not include clerical or administrative staff. "Health care professional," other than a licensed prescriber or pharmacist, may include, but is not limited to, a certified pharmacy technician or a registered technician trainee, a nurse, a certified medical assistant, or a pharmacist-intern.

"Health information exchange" or *"HIE"* means a system that allows health care professionals to appropriately access and securely share a patient's vital medical information and records as that electronic information is instantly updated and simultaneously available to each of the health care professionals across organizations, often within a region, community, or health care system.

"National drug code" or *"NDC number"* means the universal product identifier used in the United States to identify a specific human drug product.

“*Patient*” means the person or animal that is the ultimate user of a drug for whom a prescription is issued or for whom a drug is dispensed.

“*Patient's agent*” means a person legally authorized to make health care decisions or gain access to health care records on behalf of the patient for purposes of directing the patient’s care.

“*Patients rights committee*” or “*committee*” means the physician and pharmacist members of the council responsible for monitoring and ensuring protection and preservation of patients’ rights as provided in Iowa Code section 124.555(3)“*e.*”

“*PMP administrator*” means the board staff person or persons designated to manage and administer the PMP under the direction and oversight of the board and the council.

“*Practitioner*” means a prescriber or a pharmacist.

“*Practitioner's agent*” means a health care professional who is employed by or under the direct supervision of a PMP-registered practitioner and who is authorized by the practitioner to access PMP information as provided in subrule 37.4(1).

“*Prescriber*” means a licensed health care professional with the authority to prescribe prescription drugs including controlled substances.

“*Prescription monitoring program*” or “*PMP*” means the program established pursuant to these rules for the collection and maintenance of PMP information and for the provision of PMP information to authorized individuals, including health care providers, for use in treatment of their patients.

“*Prescription monitoring program database*” or “*PMP database*” means a centralized database of reportable controlled substance prescriptions dispensed to patients and includes data access logs, security tracking information, and records of each individual who requests PMP information.

“*Reportable prescription*” means the record of a Schedule II, III, or IV controlled substance dispensed by a pharmacy to a patient pursuant to a prescriber-authorized prescription. “Reportable prescription” does not include those records excluded in subrule 37.3(1).

“*Schedule II, III, and IV controlled substances*” means those substances that are identified and listed as Schedule II, III, or IV substances in Iowa Code sections 124.205 through 124.210 or in the federal Controlled Substances Act (21 U.S.C. Section 812).

[ARC 7903B, IAB 7/1/09, effective 8/5/09; ARC 0056C, IAB 4/4/12, effective 7/1/12; ARC 0242C, IAB 8/8/12, effective 1/1/13; ARC 3102C, IAB 6/7/17, effective 7/12/17]

657—37.3(124) Requirements for the PMP. Each dispenser, unless identified as exempt from reporting and who has applied for and been granted an exemption from reporting to the PMP pursuant to subrule 37.3(1), shall submit to the PMP administrator either a record of each reportable prescription dispensed during a reporting period or a zero report pursuant to subrule 37.3(5), as appropriate. A dispenser located outside the state of Iowa, unless identified as exempt from reporting and who has applied for and been granted an exemption from reporting to the PMP pursuant to subrule 37.3(1), shall submit to the PMP administrator either a record of each reportable prescription dispensed during a reporting period to a patient located in Iowa or a zero report pursuant to subrule 37.3(5), as appropriate.

37.3(1) Exemptions. The dispensing of a controlled substance as described in this subrule shall not be considered a reportable prescription. A dispenser engaged in the distribution of controlled substances solely pursuant to one or more of the practices identified in paragraph 37.3(1)“*a,*” 37.3(1)“*b,*” or 37.3(1)“*c,*” or that is not registered to handle controlled substances as described in paragraph 37.3(1)“*d,*” may apply for an exemption from reporting to the PMP. A dispenser claiming exemption pursuant to this subrule shall certify to the board, on a form provided by the board, the basis for exemption from reporting to the PMP. The PMP administrator is hereby authorized to approve or deny the pharmacy’s request for exemption from reporting to the PMP.

a. A licensed hospital pharmacy shall not be required to report the dispensing of a controlled substance for the purposes of inpatient hospital care, the dispensing of a prescription for a starter supply of a controlled substance at the time of a patient’s discharge from such a facility, or the dispensing of a prescription for a controlled substance in a quantity adequate to treat the patient for a maximum of 72 hours. A hospital pharmacy claiming exemption from reporting pursuant to this paragraph shall certify to the board that the hospital pharmacy dispenses only as provided by this paragraph.

b. A licensed pharmacy shall not be required to report the dispensing of a controlled substance for a patient residing in a long-term care facility or for a patient residing in an inpatient hospice facility. A pharmacy claiming exemption from reporting pursuant to this paragraph shall certify to the board that the pharmacy dispenses only to patients residing in a long-term care facility or to patients residing in an inpatient hospice facility.

c. A nonresident pharmacy that does not distribute controlled substances to patients located in Iowa shall not be required to report to the PMP. A nonresident pharmacy claiming exemption from reporting pursuant to this paragraph shall certify to the board that the nonresident pharmacy does not dispense controlled substances to patients located in Iowa.

d. A licensed pharmacy that does not handle controlled substances and that is not registered to handle controlled substances with the federal DEA shall not be required to report to the PMP. A pharmacy claiming exemption from reporting pursuant to this paragraph shall certify to the board that the pharmacy does not dispense controlled substances.

e. A prescriber or other authorized person who administers or dispenses a controlled substance, including samples of a controlled substance, for the purposes of outpatient care shall not be required to report such administration or dispensing. A prescriber shall not be required to submit a form or notification claiming exemption from reporting to the PMP. This exception shall not apply to a pharmacist who administers a controlled substance, as directed by the prescriber, pursuant to a prescription.

f. A wholesale distributor of a controlled substance shall not be required to report the wholesale distribution of such a substance. A wholesale distributor shall not be required to submit a form or notification claiming exemption from reporting to the PMP.

37.3(2) Data elements. The information submitted for each prescription shall include, at a minimum, the following items:

- a.* Dispenser DEA number.
- b.* Date the prescription is filled.
- c.* Prescription number.
- d.* Indication as to whether the prescription is new or a refill.
- e.* NDC number for the drug dispensed.
- f.* Quantity of the drug dispensed.
- g.* Number of days of drug therapy provided by the drug as dispensed.
- h.* Patient first and last names.
- i.* Patient address including street address, city, state, and ZIP code.
- j.* Patient date of birth.
- k.* Patient gender.
- l.* Prescriber DEA number.
- m.* Date the prescription was issued by the prescriber.
- n.* Method of payment.

37.3(3) Reporting periods. A record of each reportable prescription dispensed shall be submitted by each dispenser no later than the next business day following dispensing. Records may be submitted with greater frequency than required by this subrule.

37.3(4) Transmission methods. Prescription information shall be transmitted using one of the following methods:

a. Data upload to a reporting website via a secure Internet connection or by utilizing the secure FTP procedure. The PMP administrator or designee will provide dispensers with initial secure login and password information. Dispensers will be required to register on the reporting website prior to initial data upload.

b. Electronic media including CD-ROM, DVD, or diskette, accompanied by a transmittal form identifying the dispenser submitting the electronic media, the number of prescription records included on the media, and the individual submitting the media as directed by the PMP administrator or designee.

c. If a dispenser does not have an automated record-keeping system capable of producing an electronic report as provided in this rule, the dispenser may submit prescription information on the industry standard universal claim form. The dispenser may complete and submit the claim form on

the reporting website or, if the dispenser does not have Internet access, the completed paper claim form may be submitted as directed by the PMP administrator or designee.

d. Chain pharmacies and pharmacies under shared ownership may submit combined data transmissions on behalf of all facilities by utilizing the secure FTP procedure. Combined data transmissions shall identify the specific pharmacy that dispensed each individual prescription record included in the combined data transmission.

37.3(5) Zero reports. If a dispenser has not been identified as exempt from reporting to the PMP and the dispenser did not dispense any reportable prescriptions during a reporting period, the dispenser shall submit a zero report via the established reporting website or secure FTP procedure. The schedule identified in subrule 37.3(3) shall determine timely submission of zero reports.

[ARC 7903B, IAB 7/1/09, effective 8/5/09; ARC 0242C, IAB 8/8/12, effective 1/1/13; ARC 3102C, IAB 6/7/17, effective 7/12/17; ARC 3743C, IAB 4/11/18, effective 5/16/18]

657—37.4(124) Access to database information. All information contained in the PMP database, including prescription information submitted for inclusion in the PMP database, communications or notifications to PMP users and dispensers via the database, and records of requests for PMP information, shall be privileged and strictly confidential and not subject to public or open records laws. The board, council, and PMP administrator shall maintain procedures to ensure the privacy and confidentiality of patients, prescribers, dispensers, practitioners, practitioners' agents, and patient information collected, recorded, transmitted, and maintained in the PMP database and to ensure that program information is not disclosed to persons except as provided in this rule.

37.4(1) Prescribers and pharmacists. A health care practitioner authorized to prescribe or dispense controlled substances may obtain PMP information regarding the practitioner's patient, or a patient seeking treatment from the practitioner, for the purpose of providing patient health care. A practitioner may authorize no more than six health care professionals to act as the practitioner's agents for the purpose of requesting PMP information regarding a practitioner's patients. A practitioner's agent shall be licensed, registered, certified, or otherwise credentialed as a health care professional in a manner that permits verification of the health care professional's credentials.

a. Prior to being granted access to PMP information, a practitioner or a practitioner's agent shall submit an individual request for registration and program access. The PMP administrator shall take reasonable steps to verify the identity of a practitioner or practitioner's agent and to verify a practitioner's or practitioner's agent's credentials prior to providing a practitioner or practitioner's agent with a secure login and initial password.

(1) A practitioner shall register via a secure website established by the board for that purpose.

(2) A practitioner's agent shall register for access to PMP information on behalf of the supervising practitioner by completing and submitting a hard-copy registration form, provided by the board, that requires the signatures of both the supervising practitioner and the practitioner's agent.

b. Each practitioner or practitioner's agent registered to access PMP information shall securely maintain and use the login and password assigned to the individual practitioner or practitioner's agent. Except in an emergency when the patient would be placed in greater jeopardy by restricting PMP information access to the practitioner or practitioner's agent, a registered practitioner shall not share the practitioner's secure login and password information and shall not delegate PMP information access to another health care practitioner or to an unregistered agent. A registered practitioner's agent shall not delegate PMP information access to another individual.

c. A practitioner or practitioner's agent may submit a request for PMP information via a secure website established by the board for that purpose. The requested information shall be provided to the requesting practitioner or practitioner's agent in a format established by the board and shall be delivered via the secure website.

d. A practitioner or practitioner's agent who requests and receives PMP information consistent with the requirements and intent of these rules may provide that information to another practitioner who is involved in the care of the patient who is the subject of the information. Information from the PMP database remains privileged and strictly confidential. Such disclosures among practitioners shall be

consistent with these rules and federal and state laws regarding the confidentiality of patient information. The information shall be used for medical or pharmaceutical care purposes.

e. A practitioner or practitioner's agent shall not provide the patient with a copy of a report generated by the PMP. A patient may receive a report of the patient's own prescription history pursuant to subrule 37.4(4).

37.4(2) *Regulatory agencies and boards.* Professional licensing boards and regulatory agencies that supervise or regulate a health care professional or that provide payment for health care services shall be able to access information from the PMP database only pursuant to an order, subpoena, or other means of legal compulsion relating to a specific investigation of a specific individual and supported by a determination of probable cause. The board may charge a fee for the preparation and release of PMP information and reports as provided in rule 657—37.5(124).

a. Prior to accepting and processing a request for PMP database information from the director or director's designee of a licensing board or other authorized regulatory agency, the director or director's designee shall complete and submit a hard-copy registration form, provided by the board, that requires the signatures of both the director and the director's designee, as appropriate. The PMP administrator shall take reasonable steps to verify the identity of the director or director's designee prior to providing a director or director's designee with a secure login and initial password.

b. A director of a licensing board with jurisdiction over a health care professional, or the director's designee, who seeks access to PMP information for an investigation shall submit to the PMP administrator in a format established by the board a written request via mail, email, facsimile, or personal delivery. The request shall be signed by the director or the director's designee and shall be accompanied by an order, subpoena, or other form of legal compulsion establishing that the request is supported by a determination of probable cause.

c. A director of a regulatory agency with jurisdiction over a health care professional or with jurisdiction over a person receiving health care services pursuant to one or more programs provided by the agency, or the director's designee, who seeks access to PMP information for an investigation shall submit to the PMP administrator in a format established by the board a written request via mail, facsimile, email, or personal delivery. The request shall be signed by the director or the director's designee and shall be accompanied by an order, subpoena, or other form of legal compulsion establishing that the request is supported by a determination of probable cause.

d. The requested information shall be provided to the requesting director or director's designee in a format established by the board and shall be delivered via the secure website or by an alternate delivery method determined by the PMP administrator to be appropriate.

37.4(3) *Law enforcement agencies.* Local, state, and federal law enforcement or prosecutorial officials engaged in the administration, investigation, or enforcement of any state or federal law relating to controlled substances shall be able to access information from the PMP database by order, subpoena, or other means of legal compulsion relating to a specific investigation of a specific individual and supported by a determination of probable cause. The board may charge a fee for the preparation and release of PMP information and reports as provided in rule 657—37.5(124).

a. Prior to accepting and processing a request for PMP database information from a law enforcement officer, the officer shall complete and submit a hard-copy registration form, provided by the board, that requires the signatures of both the officer and the officer's direct superior. The PMP administrator shall take reasonable steps to verify the identity of the officer and the officer's direct superior prior to providing the officer with a secure login and initial password.

b. A law enforcement officer shall submit to the PMP administrator in a format established by the board a written request via mail, email, facsimile, or personal delivery. The request shall be signed by the requesting officer or the officer's superior. The request shall be accompanied by an order, subpoena, or warrant issued by a court or legal authority that requires a determination of probable cause and shall be processed by the PMP administrator.

c. A report identifying PMP information relating to the specific individual identified by the order, subpoena, or warrant shall be delivered to the law enforcement officer via the secure website or by an alternate delivery method determined by the PMP administrator to be appropriate.

37.4(4) Patients. A patient or the patient's agent may request and receive PMP information regarding prescriptions reported to have been dispensed to the patient.

a. A patient may submit a signed, written request for records of the patient's prescriptions dispensed during a specified period of time. The board shall provide the patient with a request form requiring identification of the patient by name, including any aliases used by the patient, and the patient's date of birth and gender. The request form shall also require any address where the patient resided during the time period of the request and the patient's current address and daytime telephone number. A patient may personally deliver the completed request to the PMP administrator or designee at the offices of the board located at 400 S.W. Eighth Street, Suite E, Des Moines, Iowa 50309-4688. The patient will be required to present current government-issued photo identification at the time of delivery of the request. A copy of the patient's identification and request shall be maintained in the records of the PMP.

b. A patient who is unable to personally deliver the request to the board offices may submit a request via mail or commercial delivery service. The request shall comply with all provisions of paragraph "a" above, and the signature of the requesting patient shall be witnessed and the patient's identity shall be attested to by a currently registered notary public. In addition to the notary's signature and assurance of the patient's identity, the notary shall certify a copy of the patient's government-issued photo identification and that certified copy shall be submitted with the written request. The request shall be submitted to the Iowa Board of Pharmacy at the address identified in paragraph "a."

c. In the case of a patient whose health care decisions have been legally transferred to the patient's agent, the patient's agent may submit a request on behalf of the patient pursuant to the appropriate procedure in paragraph "a" or "b." In addition to the patient's information, the patient's agent shall be identified by name, current address, and telephone number. In lieu of the patient's signature and identification, the patient's agent shall sign the request and the government-issued photo identification shall identify the patient's agent. The patient's agent shall include a certified copy of the legal document that transferred control over decisions regarding the patient's health care to the patient's agent.

d. A report prepared pursuant to this subrule shall be delivered to the patient or the patient's agent, as appropriate, by personal delivery or via mail or alternate secure delivery.

37.4(5) Court orders and subpoenas. The PMP administrator shall provide PMP information in response to court orders and county attorney or other subpoenas issued by a court upon a determination of probable cause. The board may charge a fee for the preparation and release of PMP information and reports as provided in rule 657—37.5(124).

37.4(6) Statistical data. The PMP administrator or designee may provide summary, statistical, or aggregate data to public or private entities for statistical, public research, public policy, or educational purposes. Prior to the release of any such data, the PMP administrator or designee shall remove any personal identifying information or verify that any personal identifying information that could be used to identify an individual patient, prescriber, dispenser, practitioner, or other person who is identified in the PMP information or data has been removed from the PMP information or data. The board may charge a fee for the preparation and release of statistical data as provided in rule 657—37.5(124).

37.4(7) PMP administrator access. Other than statistical data as described in subrule 37.4(6) and technical, error, and administrative function reports and information needed by PMP support staff to determine that records are received and maintained in good order or to review or resolve issues of reported or suspected erroneous data as provided in rule 657—37.7(124), any other reports concerning the information received from dispensers shall only be prepared at the direction of the board, the council, or the PMP administrator. The board and the council may compile statistical reports from PMP information for use in determining the advisability of continuing the PMP and for use in preparing required reports to the governor and the legislature. The reports shall not include information that would identify any patient, prescriber, dispenser, practitioner, practitioner's agent, or other person who is identified in the PMP information or data.

37.4(8) Electronic health and pharmacy information systems. The board may contract with electronic health record systems, health information exchanges, and electronic pharmacy information systems to securely integrate into those electronic systems access to patient prescription histories and

other PMP information available to authorized practitioners and practitioners' agents. Institutional users may be established to identify the facilities and contracted electronic systems and to facilitate secure access by the prescribing practitioners and pharmacists authorized to access PMP information by and through the electronic systems.

a. EHRS, HIE, and e-pharmacy system integration contracts or agreements shall ensure protection of confidential information contained in and received from the PMP.

b. EHRS, HIE, and e-pharmacy system integration contracts or agreements shall restrict access to PMP information to authorized practitioners and practitioner agents as provided by these rules except that individual user registration with the PMP may not be required if the identity of the specific individual receiving or requesting information from the PMP, including a record of the patient whose record is requested, is logged and maintained in an alternate record and is available to the PMP administrator upon request.

c. PMP and electronic system integration may require a separate contract or agreement with a third-party interface or translation service provider to facilitate integration of the PMP into the electronic system. The contract with the service provider shall provide that translation, transmission, or other data integration services provided under the contract are accomplished via a secure encrypted channel that ensures the confidentiality of all information exchanged between the PMP and the electronic system.

37.4(9) Medical examiner or medical examiner investigator. A medical examiner or medical examiner investigator may obtain PMP information when the information requested by the examiner or investigator relates to an investigation being conducted by the examiner or investigator.

[ARC 7903B, IAB 7/1/09, effective 8/5/09; ARC 0056C, IAB 4/4/12, effective 7/1/12; ARC 3102C, IAB 6/7/17, effective 7/12/17; ARC 3743C, IAB 4/11/18, effective 5/16/18]

657—37.5(124) Fees. The board may charge a fee and recover costs incurred for the provision of PMP information, including statistical data, except that no fees or costs shall be assessed to a dispenser for reporting to the PMP or to a practitioner or practitioner's agent for querying the PMP regarding a practitioner's patient. Any fees or costs assessed by the board shall be considered repayment receipts as defined in Iowa Code section 8.2.

[ARC 7903B, IAB 7/1/09, effective 8/5/09; ARC 3102C, IAB 6/7/17, effective 7/12/17]

657—37.6(124) PMP information retained. All dispenser records of prescriptions reported to the PMP shall be retained by the PMP for a period of four years following the date of the record. All records of access to or query of PMP information shall be retained by the PMP for a period of four years following the date of the record. At least semiannually, all PMP information identified as exceeding that four-year period shall be deleted from the PMP and discarded in a manner to maintain the confidentiality of the PMP information and data. Statistical data and reports from which all personally identifiable information has been removed or which do not contain personally identifiable information as provided in subrules 37.4(6) and 37.4(7) may be retained by the PMP for historical purposes.

[ARC 7903B, IAB 7/1/09, effective 8/5/09]

657—37.7(124) Information errors. Any person who believes that PMP information about that person is false or in error shall submit a written statement to the PMP administrator. The statement shall identify the information the person believes to be false or in error and the reason the individual believes the information to be false or in error. The PMP administrator may examine the information identified in the statement and may request the assistance of the board's compliance staff to determine whether or not the PMP information is accurate. Prior to initiating any action to correct, delete, or amend any PMP information, the PMP administrator shall submit the statement and the resulting report to the patients rights committee for review and approval of the recommended action. If correction, deletion, or amendment of any PMP information is authorized, that action shall be accomplished by the PMP administrator within 72 hours of the committee's decision. The PMP administrator shall respond, in writing, to the person who submitted the statement charging that the PMP information was false or in error. The response shall identify the action approved by the committee.

[ARC 7903B, IAB 7/1/09, effective 8/5/09]

657—37.8(124) Dispenser and practitioner records. Nothing in these rules shall apply to records created or maintained in the regular course of business of a pharmacy or health care practitioner. All information, documents, or records otherwise available from pharmacies or health care practitioners shall not be construed as immune from discovery or use in any civil proceedings merely because the information contained in those records was reported to the PMP in accordance with these rules.
[ARC 7903B, IAB 7/1/09, effective 8/5/09]

657—37.9(124) Prohibited acts. The PMP administrator shall report to the licensing board of a dispenser, a practitioner, or a practitioner's agent any known violation of the confidentiality provisions or the reporting requirements of the law and these rules for which the dispenser, practitioner, or practitioner's agent is subject to disciplinary action.

37.9(1) Confidentiality. A pharmacy, pharmacist, practitioner, or practitioner's agent who knowingly fails to comply with the confidentiality provisions of the law or these rules or who delegates PMP information access to another individual, except as provided in paragraph 37.4(1) "b," is subject to disciplinary action by the appropriate professional licensing board. The PMP administrator or a member of the program staff who knowingly fails to comply with the confidentiality provisions of the law or these rules is subject to disciplinary action by the board. In addition to any disciplinary action or sanctions imposed by a professional licensing board, a pharmacy, pharmacist, practitioner, practitioner's agent, PMP administrator, or member of the PMP program staff who knowingly accesses, uses, or discloses program information in violation of Iowa law or these rules is subject to criminal prosecution as provided in Iowa Code section 124.558.

37.9(2) Dispenser reporting. A dispenser or a pharmacist who fails to comply with the reporting requirements of the law or these rules may be subject to disciplinary action by the board.

[ARC 7903B, IAB 7/1/09, effective 8/5/09; ARC 0056C, IAB 4/4/12, effective 7/1/12; ARC 3102C, IAB 6/7/17, effective 7/12/17]

These rules are intended to implement Iowa Code sections 124.550 to 124.558.

[Filed ARC 7903B (Notice ARC 7676B, IAB 4/8/09), IAB 7/1/09, effective 8/5/09]

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[Filed ARC 3743C (Notice ARC 3505C, IAB 12/20/17), IAB 4/11/18, effective 5/16/18]

CHAPTER 502
ELECTRICIAN AND ELECTRICAL CONTRACTOR LICENSING PROGRAM—LICENSING
REQUIREMENTS, PROCEDURES, AND FEES

661—502.1(103) License categories and licenses required.

502.1(1) The following license categories are established:

- a.* Electrical contractor.
- b.* Residential electrical contractor.
- c.* Master electrician, class A.
- d.* Master electrician, class B.
- e.* Residential master electrician.
- f.* Journeyman electrician, class A.
- g.* Journeyman electrician, class B.
- h.* Residential electrician.
- i.* Apprentice electrician.
- j.* Special electrician.
- k.* Unclassified person.
- l.* Inactive master electrician.

502.1(2) A person who holds any class of license issued by the board, other than a class B license, a residential electrical contractor license, a residential master electrician license, or a residential electrician license, may perform the work authorized by that license anywhere within the state of Iowa. A person who holds a special electrician license may perform the work which is authorized by that license endorsement. A person who holds a class B license may perform the work authorized by that license except in a political subdivision which, by local ordinance, has, pursuant to Iowa Code section 103.29, subsection 4, restricted or barred such work by a person who holds a class B license. A person who holds a residential electrical contractor license, a residential master electrician license, or a residential electrician license may perform the work authorized by that license anywhere within the state of Iowa except within a political subdivision which has, by local ordinance, restricted the use of such a license.

502.1(3) A person who does not have a current valid license shall not perform work as an electrician or as an unclassified person. A person shall not perform work which requires licensing and which is not specifically authorized under the license issued.

EXCEPTION 1: A person who holds a current valid license issued by a political subdivision may perform work as an electrician or unclassified person within the corporate limits of the political subdivision which issued the license.

EXCEPTION 2: A person may work for up to 100 continuous days as an unclassified person prior to obtaining a license. Any documented time during which a person has worked as an unclassified person prior to January 1, 2008, or any time during which a person has worked as a licensed unclassified person shall be credited to any applicable experience requirement. Any time during which a person works as an unclassified person without a license on or after January 1, 2008, shall not be counted toward any such experience requirement, except that a person may receive credit for time worked as an unclassified person on or after January 1, 2008, without a license if the person has applied for a license.

EXCEPTION 3: Electrical installations in buildings, including residences or facilities which are being constructed as part of a course of instruction by an accredited educational institution, may be performed by a person who is not licensed. Such installations are subject to the requirements for permits and inspections pursuant to 661—Chapter 552.

EXCEPTION 4: A license is not required for a person who performs any electrical installation on a farm or a farm building if the farm building is not regularly open to the public as a place of business for the retail sale of goods, wares, services, or merchandise and if the person performing the installation is associated with the farm as a holder of a legal or equitable interest, a relative or employee of the holder, or an operator or manager of the farm. This exception does not apply to a residential installation located on a farm.

502.1(4) An apprentice electrician or an unclassified person, while performing electrical work, shall be directly supervised at all times by a master electrician or a journeyman electrician or, while performing residential electrical work only, by a residential master electrician, a residential electrician, or a special residential electrician. A master electrician, a journeyman electrician, a residential master electrician, a residential electrician, or a special residential electrician shall at no time directly supervise more than three apprentice electricians and unclassified persons at once. For purposes of this subrule, “unclassified person” includes a person who is working as an unclassified person and holds either an “unclassified person” license or another license issued by the board.

502.1(5) A journeyman electrician or a residential electrician shall work under the general direction of a master electrician or, while performing residential electrical work only, under the general direction of a residential master electrician. A special residential electrician may perform residential work without supervision or direction.

[ARC 8396B, IAB 12/16/09, effective 2/1/10; ARC 9234B, IAB 11/17/10, effective 1/1/11; ARC 9811B, IAB 10/19/11, effective 12/1/11; ARC 3733C, IAB 4/11/18, effective 3/26/18]

661—502.2(103) License requirements.

502.2(1) An electrical contractor license may be issued to a person who submits to the board the required application with the applicable fee, who holds or employs a person who holds an active master electrician license, who is registered as a contractor with the labor services division of Iowa workforce development, and who is not disqualified pursuant to rule 661—502.4(103). An electrical contractor license issued to a person who holds a class B master electrician license is subject to the same restriction of use as is the class B master electrician license.

502.2(2) A residential electrical contractor license may be issued to a person who is licensed as a class A master electrician, a class B master electrician, or a residential master electrician and who is registered with the state of Iowa as a contractor pursuant to Iowa Code chapter 91C.

502.2(3) A class A master electrician license may be issued to a person who submits to the board a completed application with the applicable fee, who is not disqualified from holding a license pursuant to rule 661—502.4(103), and who meets one of the following requirements:

a. Has completed one year of experience as a licensed journeyman electrician, and has passed a supervised written examination for master electrician approved by the board with a score of 75 or higher; or

b. As of December 31, 2007, held a current valid license as a master electrician issued by a political subdivision in Iowa, the issuance of which required passing a supervised written examination approved by the board, and one year of experience as a journeyman electrician; or

c. Holds a current class B master electrician license and has passed a supervised written examination for master electrician approved by the board with a score of 75 or higher.

502.2(4) A class B master electrician license may be issued to a person who submits to the board a completed application with the applicable fee; who is not disqualified from holding a license pursuant to rule 661—502.4(103); who presents credible evidence of having worked for a total of 16,000 hours of cumulative experience as a master electrician, of which at least 8,000 hours shall have been worked since January 1, 1998; and whose experience as a master electrician began on or before January 1, 1998.

502.2(5) A residential master electrician license may be issued to a person who submits to the board a completed application with the applicable fee, who is not disqualified from holding a license pursuant to rule 661—502.4(103), and who meets one of the following requirements:

a. Holds a current residential electrician or journeyman electrician license, has 2,000 hours of verified experience as a residential electrician or a journeyman electrician, and has passed a residential master electrician examination approved by the board; or

b. Holds a current special electrician license with a residential endorsement, has 4,000 hours of verified experience, and has passed a residential master electrician examination approved by the board.

502.2(6) A class A journeyman electrician license may be issued to a person who submits to the board a completed application with the applicable fee, who is not disqualified from holding a license pursuant to rule 661—502.4(103), and who meets one of the following requirements:

a. Has successfully completed a registered apprenticeship program, has passed a supervised written examination for journeyman electrician approved by the board with a score of 75 or higher, and has completed four years of experience as an apprentice electrician.

b. Holds a current class B journeyman electrician license and has passed a supervised written examination for journeyman electrician approved by the board with a score of 75 or higher.

c. Holds a current electrician license in another state, has passed a supervised written examination for journeyman electrician approved by the board with a score of 75 or higher, and has satisfied the sponsorship requirements for testing for a journeyman class A license by providing evidence of all of the following:

(1) Current licensure as a journeyman or master electrician from another state which required passing a test sponsored by that state.

(2) Completion of 18 hours of continuing education units approved by the board.

(3) Completion of 1,000 hours of work in Iowa as an unclassified person.

d. Holds a current license issued by the board, excluding a special electrician license other than special residential electrician license; has passed a supervised written examination for journeyman electrician approved by the board with a score of 75 or higher; has completed 54 hours of continuing education approved by the board; and has completed 16,000 hours of electrical work while licensed by the board, except as a special electrician other than a special residential electrician, as verified by a master electrician licensed by the board. The 16,000 hours must include at least the following minimum number of hours of work on commercial or industrial installations in the categories indicated: 500 hours of preliminary work, 2,000 hours of rough-in work, 2,000 hours of finish work, 2,000 hours of lighting and service work, 500 hours of troubleshooting, and 500 hours of motor control work. At least 4,000 hours of the 16,000 hours must have been completed by the applicant within the five years immediately preceding the submission date of the application.

EXCEPTION: On or before December 31, 2019, a maximum of 10,000 of the required 16,000 hours of verified work experience may have been completed between January 1, 2000, and December 31, 2007, without licensure from the board or from any political subdivision.

e. Holds a current license issued by the board as a residential electrician or residential master electrician, has passed a supervised written examination for journeyman electrician approved by the board with a score of 75 or higher, and has completed 4,000 hours of work on commercial or industrial electrical installations while licensed by the board, as verified by a master electrician licensed by the board. The 4,000 hours must include at least the following minimum numbers of hours in the categories indicated: 100 hours of preliminary work, 500 hours of rough-in work, 500 hours of finish work, 500 hours of lighting and service work, 100 hours of troubleshooting, and 100 hours of motor control work.

f. Holds a current license issued by the board, has satisfactorily completed an approved postsecondary electrical education program, has passed a supervised written examination for journeyman electrician approved by the board with a score of 75 or higher, and, subsequent to beginning the postsecondary electrical education program, has completed at least 6,000 hours of electrical work while licensed by the board, as verified by a master electrician licensed by the board.

502.2(7) A class B journeyman electrician license may be issued to a person who submits to the board a completed application with the applicable fee; who is not disqualified from holding a license pursuant to rule 661—502.4(103); who presents credible evidence of having worked for a total of 16,000 hours of cumulative experience as a journeyman electrician or master electrician, of which at least 8,000 hours shall have been worked since January 1, 1998; and whose experience as a journeyman electrician or master electrician began on or before January 1, 1998.

502.2(8) A residential electrician license may be issued to a person who submits to the board a completed application with the applicable fee, who is not disqualified from holding a license pursuant to rule 661—502.4(103), and who meets one of the following requirements:

a. Holds a current residential special electrician license and has held that license for a minimum of one year and has passed a residential electrician examination approved by the board; or

b. Has completed 6,000 hours of experience as an apprentice electrician and has passed a residential electrician examination approved by the board. An applicant may take the examination

required by this paragraph after completing 5,000 hours of experience as an apprentice electrician, although the license will not be issued until the applicant has completed 6,000 hours of such experience; or

c. Has completed 4,000 hours of experience working under the direct supervision of a residential master electrician, a residential electrician, a master electrician, or a journeyman electrician; has successfully completed a minimum of one academic year of an electrical trade school approved by the board; and has passed a residential electrician examination approved by the board; or

d. Has completed 8,000 hours of verified experience as a licensed unclassified person including at least 2,000 hours of verified work experience in residential wiring and has passed a residential electrician examination approved by the board; or

e. Has successfully completed a registered residential electrician apprenticeship program and passed a supervised written residential electrician examination approved by the board with a score of 75 or higher.

502.2(9) A special electrician license may be issued to a person who submits to the board a completed application with the applicable fee, who is not disqualified from holding a license pursuant to rule 661—502.4(103), and who meets the qualifications for any endorsement entered on the license. Each special electrician license shall carry one or more endorsements as specified in paragraphs “*a*” through “*d*.”

a. Endorsement 1, “Irrigation System Wiring,” shall be included on a special electrician license if the licensee requests it and has passed a supervised examination approved by the board or has completed two years, or 4,000 hours, of documented experience in the wiring of irrigation systems.

b. Endorsement 2, “Disconnecting and Reconnecting Existing Air Conditioning and Refrigeration Systems,” shall be included on a special electrician license if the licensee requests it and has passed a supervised examination approved by the board or has completed two years of documented experience in the disconnecting and reconnecting of existing air conditioning and refrigeration systems.

NOTE: An individual who holds any of the following licenses issued by the plumbing and mechanical systems board established pursuant to Iowa Code section 105.3 is not required to hold a license issued by the electrical examining board in order to perform disconnection and reconnection of existing air conditioning and refrigeration systems:

1. Master HVAC.
2. Journeyman HVAC.
3. Master refrigeration.
4. Journeyman refrigeration.

c. Endorsement 3, “Sign Installation,” shall be included on a special electrician license if the licensee requests that it be included. This endorsement does not authorize a licensee to connect power to a sign that has a voltage greater than 220V and an ampere rating greater than 20 amps. Initial installation or upgrading of the branch circuits supplying power to the sign shall be completed by a licensed master electrician or by a licensed journeyman electrician under the supervision of a master electrician.

d. Endorsement 4, “Residential Electrician,” shall be included on a special electrician license if the licensee requests it and has passed a supervised written examination approved by the board or has completed four years of documented experience performing residential electrical work. A political subdivision may, by enactment of an ordinance filed with the board prior to its effective date, require that a special electrician performing work authorized by this endorsement be supervised by a master electrician. Special electrician licenses with “residential electrician” endorsements shall not be issued after December 31, 2010. Renewals of special electrician licenses with “residential electrician” endorsements shall not be issued after December 31, 2013.

502.2(10) An apprentice electrician license may be issued to a person who submits a completed application to the board with the applicable fee, who is not disqualified pursuant to rule 661—502.4(103), and who is participating in a registered apprenticeship program. A person may hold an apprentice electrician license for no more than six years from the original date on which an apprentice electrician license is granted, except that a person may apply to the board for an exception to this limitation based

upon a documented hardship. “Documented hardship” includes, but is not limited to, an interruption in service as an apprentice electrician for active military duty or for an extended illness.

502.2(11) A license as an unclassified person may be issued to a person who submits a completed application to the board with the applicable fee, who is not disqualified pursuant to rule 661—502.4(103), and who is employed by a licensed electrical contractor. Any person who holds a current license issued by the board, including a special residential electrician license, but excluding other special electrician licenses, may work as an unclassified person without holding an unclassified person license.

502.2(12) In lieu of renewal of the active master electrician license, an inactive master electrician license may be issued to a holder of a master electrician license whose license is due for renewal and who requests placement in inactive status. A holder of an inactive license shall maintain all requirements which would apply for an active master electrician license, except for payment of the fee required for an active license, during the term of the inactive license. If the license holder fails to meet any such requirement during the term of the inactive license, the license holder shall not be entitled to reinstatement of an active license. If the license holder continues to meet all such requirements while holding an inactive license, the license holder may obtain an active master electrician license by surrendering the inactive master electrician license, filing an application for reinstatement, and paying the applicable license fee. The holder of an inactive license who seeks reinstatement of an active license shall not receive any refund of the fee paid for the inactive license. A person who holds an inactive license may not perform work which requires the person to be a holder of that license but may perform work authorized by any active license issued by the board which the person holds.

502.2(13) Retaking an examination. If passage of an examination is a requirement for issuance of a license:

a. An applicant who has taken the examination for a license twice and has failed the examination twice shall wait six months before taking the examination again and shall complete 12 hours of continuing education approved by the board on subjects related to the standards specified in 661—Chapter 504. After satisfying the requirements of this paragraph, the applicant may take the examination two additional times, or a maximum of four times.

b. An applicant who has satisfied the conditions of paragraph “*a*” and who has taken the examination two additional times, or a total of four times, and has failed the examination four times shall wait an additional six months and shall complete an additional 12 hours of continuing education approved by the board on subjects related to the standards specified in 661—Chapter 504 before taking the examination again. After satisfying the requirements of this paragraph, the applicant may take the examination two additional times, or a maximum of six times.

c. An applicant who has satisfied the conditions of paragraph “*b*” and who has taken the examination two additional times, or a total of six times, and has failed the examination six times shall not be permitted to take the examination an additional time unless approved to do so by the board. An applicant who wishes to take an examination after failing it six times shall wait six months and then may petition the board to allow the applicant to take the examination an additional time. The applicant may be required to appear personally before the board when the board is considering the petition.

502.2(14) Reciprocal journeyman licensing. A journeyman class A license may be issued, without examination, to a person who holds a license from another state provided that:

a. The board has entered into an agreement with the other state providing for reciprocal issuance of licenses and that the agreement recognizes the equivalency of the examination required for the license issued by the other state and the examination required for the Iowa license to be issued; and

b. The applicant has successfully completed a supervised written examination approved by the other state with a score of 75 or higher in order to obtain the license from the other state; and

c. The applicant holds an applicable license from the other state at the time the application for an Iowa license is filed and has held the applicable license from the other state continuously for one year at the time the application for an Iowa license is filed; and

d. The applicant has submitted:

(1) A completed application for the Iowa license;

- (2) A copy of the applicable license from the other state, clearly showing the license number and any other identifying information;
 - (3) The applicable fee;
 - (4) The sworn affidavit required under subparagraph 502.2(14)“e”(2), if applicable; and
 - (5) Any other information required by the board; and
- e.* The applicant has either:
- (1) Completed an approved apprenticeship program; or
 - (2) Completed 16,000 hours of electrical work as an electrician licensed by the other state, as documented by submission of a sworn affidavit signed by the applicant.

502.2(15) Reciprocal master licensing. A master class A license may be issued, without examination, to a person who holds an equivalent license from another state provided that:

a. The board has entered into an agreement with the other state providing for reciprocal issuance of licenses and that the agreement recognizes the equivalency of the examination required for the license issued by the other state and the examination required for the Iowa license to be issued; and

b. The applicant has successfully completed a supervised written examination approved by the other state, with a score of 75 or higher, in order to obtain the license from the other state; and

c. The applicant holds an applicable license from the other state at the time the application for an Iowa license is filed and has held the applicable license from the other state continuously for one year at the time the application for an Iowa license is filed; and

d. The applicant has submitted:

(1) A completed application for the Iowa license;

(2) A copy of the applicable license from the other state, clearly showing the license number and any other identifying information;

(3) The applicable fee;

(4) Any other information required by the board, which may include, but is not limited to, additional evidence that the person’s license from the other state is currently valid; and

e. The applicant has either:

(1) Completed an approved apprenticeship program; or

(2) Completed 16,000 hours of electrical work as an electrician licensed by the other state, documented by a sworn affidavit signed by the applicant.

[**ARC 8396B**, IAB 12/16/09, effective 2/1/10; **ARC 9234B**, IAB 11/17/10, effective 1/1/11; **ARC 9626B**, IAB 7/27/11, effective 9/1/11; **ARC 9811B**, IAB 10/19/11, effective 12/1/11; **ARC 0120C**, IAB 5/16/12, effective 7/1/12; **ARC 2245C**, IAB 11/25/15, effective 12/30/15]

661—502.3(103) License terms and fees. The following table sets out the length of term of each license and the fee for the license.

| License Type | Term | Fee |
|-----------------------------------|---------|-------|
| Electrical Contractor | 3 years | \$375 |
| Residential Electrical Contractor | 3 years | \$375 |
| Master Electrician, Class A | 3 years | \$375 |
| Master Electrician, Class B | 3 years | \$375 |
| Residential Master Electrician | 3 years | \$375 |
| Journeyman Electrician, Class A | 3 years | \$75 |
| Journeyman Electrician, Class B | 3 years | \$75 |
| Residential Electrician | 3 years | \$75 |
| Special Electrician | 3 years | \$75 |
| Apprentice Electrician | 1 year | \$20 |
| Unclassified Person | 1 year | \$20 |
| Inactive Master Electrician | 3 years | \$75 |

502.3(1) Fees are payable in advance with the application, by check or warrant to the Department of Public Safety. The memo area of the check should read “Electrician License Fees.”

502.3(2) Notice of renewal shall be provided to each licensee no less than 30 days prior to the expiration of the current license.

502.3(3) If a license is issued for less than the period of time specified in the table above, the fee shall be prorated according to the number of months for which the license is issued.

502.3(4) A licensee who is on active military deployment for 91 or more consecutive calendar days during the term of a license may have the license period tolled as follows. “Tolled” means that the expiration date of the license shall be delayed for the period of time during which the license term is tolled.

a. A licensee who is on active military deployment for 91 or more consecutive calendar days during a licensing period may have the license terms tolled for one year.

b. A licensee who is on active military deployment for 366 or more consecutive calendar days during a licensing period may have the license terms tolled for two years.

c. A licensee who is on active military deployment for 91 or more consecutive calendar days but fewer than 366 consecutive calendar days may petition the board to have the license tolled for two years upon a showing of a special hardship which would not be alleviated by tolling the license term for only one year.

d. A licensee who requests that the term of a license be tolled pursuant to this subrule shall provide a copy of military orders showing the beginning and ending dates of the deployment or deployments which are the basis for the request.

502.3(5) A licensee may obtain a replacement license for a license that has been lost. To order a replacement license, the licensee shall notify the board office in writing that the license has been lost and shall provide any information required by the board office, which may include, but is not limited to, the license number, the name of the licensee, and a description of the circumstances of the loss, if known. The fee for issuance of a replacement license shall be \$15.

EXCEPTION: If a licensee who is located in an area covered by a disaster emergency proclamation issued by the governor pursuant to Iowa Code section 29C.6 which is currently in force or has been in force within the previous 90 days certifies to the board that the license was lost as a direct result of conditions which relate to the issuance of the disaster emergency proclamation, the fee for replacement of the license shall be waived.

502.3(6) Refunds of license fees shall be made under the following circumstances:

a. If an error on the part of the staff or the applicant or licensee has resulted in an overpayment of fees, the refund shall be in the amount of overpayment and shall be made if the overpayment is discovered by staff of the board or if the overpayment is discovered by the applicant or licensee and the applicant or licensee requests a refund.

b. If an applicant for an initial license or a renewal license dies prior to the effective date of a license for which the applicant has applied and paid the applicable fee, the license fee shall be refunded to the estate of the applicant upon receipt of a request from the estate of the applicant, accompanied by a certified copy of the death certificate.

[ARC 8396B, IAB 12/16/09, effective 2/1/10; ARC 9234B, IAB 11/17/10, effective 1/1/11; ARC 2245C, IAB 11/25/15, effective 12/30/15]

661—502.4(103) Disqualifications for licensure. An application for a license shall be denied if any of the following apply:

502.4(1) The applicant fails to meet the requirements for the license for which the applicant has applied or the applicant fails to provide adequate documentation of any requirement.

502.4(2) The applicant has previously had a license revoked or suspended by the board, and the circumstances which formed the basis of the revocation or suspension have not been corrected. If a license was revoked or suspended and conditions were imposed for the restoration of the license, licensure shall be denied unless those conditions have been met.

502.4(3) The applicant has been denied, for cause, a license to work, or a license as an electrician has been revoked, for cause, in any other state or political subdivision and the applicant has not subsequently received a license from the state or political subdivision which denied or revoked the license. An applicant who has been denied a license pursuant to this provision may apply to the board for a license and, upon a showing of evidence satisfactory to the board that the condition or conditions which led to the denial or revocation no longer apply, the board may grant the license to the applicant.

502.4(4) The applicant falsifies or fails to provide any information requested in connection with the application or falsifies any other information provided to the board in support of the application.

502.4(5) The applicant may be denied a license if the applicant has previously been convicted of a criminal offense involving, but not limited to, fraud, misrepresentation, arson or theft, or if the applicant is currently delinquent in paying employment taxes to the state of Iowa or the United States. If the denial is based upon conviction of a criminal offense, the board shall examine the specific circumstances of the offense and may grant the license if, in the judgment of the board, sufficient time has passed since the conviction and there is no further evidence of criminal conduct on the part of the applicant.

502.4(6) The applicant has unpaid fees due to the board which are 120 days or more past due. The license for which the applicant applied may be issued after the fees are paid if the applicant is not otherwise disqualified from obtaining the license.

[ARC 8396B, IAB 12/16/09, effective 2/1/10; ARC 0120C, IAB 5/16/12, effective 7/1/12]

661—502.5(103) License application. Any person seeking a license from the board shall submit a completed application to the board accompanied by the applicable fee payable by check, money order, or warrant to the Iowa Department of Public Safety. The memo area of the check should read “Electrician Licensing Fees.” The application shall be submitted on the form prescribed by the board, which may be obtained from the board office.

[ARC 8396B, IAB 12/16/09, effective 2/1/10]

661—502.6(103) Restriction of use of class B licenses by political subdivisions. A political subdivision may disallow or restrict the use of a class B license to perform electrical work within the geographic limits of that subdivision through adoption of a local ordinance. A copy of any such ordinance shall be filed with the board office prior to the effective date of the ordinance. If a class B license holder held a license issued or recognized by a political subdivision on December 31, 2007, that political subdivision may not restrict the license holder from performing work which would have been permitted under the terms of the license issued or recognized by the political subdivision.

EXCEPTION 1: An ordinance restricting or disallowing electrical work by holders of class B licenses shall not apply to work which is not subject to the issuance of permits by the political subdivision.

EXCEPTION 2: An ordinance restricting or disallowing electrical work by holders of class B licenses which was passed prior to January 1, 2008, shall be filed with the board as soon as practicable and, in any case, no later than April 1, 2008.

[ARC 8396B, IAB 12/16/09, effective 2/1/10]

661—502.7(103) Financial responsibility. Any holder of an electrical contractor license or any holder of an electrician license who is not employed by a licensed electrical contractor and who contracts to provide electrical work which requires a license issued pursuant to 661—Chapters 500 through 503 shall, at all times, maintain insurance coverage as provided in this rule.

502.7(1) The licensee shall maintain general and complete operations liability insurance in the amount of at least \$1 million for all work performed which requires licensing pursuant to 661—Chapters 500 through 503.

a. The carrier of any insurance coverage maintained by the licensee to meet this requirement shall notify the board 30 days prior to the effective date of cancellation or reduction of the coverage.

b. The licensee shall cease operation immediately if the insurance coverage required by this rule is no longer in force and other insurance coverage meeting the requirements of this rule is not in force. A licensee shall not initiate any electrical work which cannot reasonably be expected to be completed prior to the effective date of the cancellation of the insurance coverage required by this rule and of which

the licensee has received notice, unless new insurance coverage meeting the requirements of this rule has been obtained and will be in force upon cancellation of the prior coverage.

502.7(2) Reserved.

[ARC 8396B, IAB 12/16/09, effective 2/1/10]

These rules are intended to implement 2007 Iowa Acts, chapter 197.

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CHAPTER 551
ELECTRICAL INSPECTION PROGRAM—DEFINITIONS

661—551.1(103) Applicability. The definitions provided in this chapter apply to 661—Chapters 550 through 559, inclusive.

661—551.2(103) Definitions. The following definitions apply to the electrical inspection program:

“Apprentice electrician” means any person who, as such person's principal occupation, is engaged in learning and assisting in the installation, alteration, and repair of electrical wiring, apparatus, and equipment as an employee of a person licensed under this chapter, and who is licensed by the board and is progressing toward completion of an apprenticeship training program registered by the Bureau of Apprenticeship and Training of the United States Department of Labor. For purposes of this chapter, persons who are not engaged in the installation, alteration, or repair of electrical wiring, apparatus, and equipment, either inside or outside buildings, shall not be considered apprentice electricians.

“Board” means the electrical examining board created under Iowa Code Supplement section 103.2.

“Class A journeyman electrician” means a person having the necessary qualifications, training, experience, and technical knowledge to wire for or install electrical wiring, apparatus, and equipment and to supervise apprentice electricians and who is licensed by the board.

“Class A master electrician” means a person having the necessary qualifications, training, experience, and technical knowledge to properly plan, lay out, and supervise the installation of electrical wiring, apparatus, and equipment for light, heat, power, and other purposes and who is licensed by the board.

“Class B journeyman electrician” means a person having the necessary qualifications, training, experience, and technical knowledge to wire for or install electrical wiring, apparatus, and equipment and who meets and is subject to the requirements of Iowa Code Supplement section 103.12.

“Class B master electrician” means a person having the necessary qualifications, training, experience, and technical knowledge to properly plan, lay out, and supervise the installation of electrical wiring, apparatus, and equipment and who meets and is subject to the requirements of Iowa Code Supplement section 103.10.

“Commercial” means a use, installation, structure, or premises associated with a place of business where goods, wares, services, or merchandise are stored or offered for sale on a wholesale or retail basis. “Commercial” includes a residence only if the residence is regularly open to the public as a place of business as provided in this definition. “Commercial” does not include any use, installation, structure, or premises associated with a farm or an industrial installation.

“Electrical contractor” means a person affiliated with an electrical contracting firm or business who is licensed by the board as either a class A or class B master electrician and who is also registered with the state of Iowa as a contractor.

“Emergency installation” means an electrical installation necessary to restore power to a building or facility when existing equipment has been damaged due to a natural or man-made disaster or other weather-related cause. Emergency installations may be performed by persons properly licensed to perform the work, and may be performed prior to submission of a request for permit or request for inspection. A request for permit and request for inspection, if required by rule 661—552.1(103), shall be made as soon as practicable and, in any event, no more than 72 hours after the installation is completed.

“Farm” means land, buildings and structures used for agricultural purposes including but not limited to the storage, handling, and drying of grain and the care, feeding, and housing of livestock.

“Industrial installation” means an installation intended for use in the manufacture or processing of products involving systematic labor or habitual employment and includes installations in which agricultural or other products are habitually or customarily processed or stored for others, either by buying or reselling on a fee basis.

“Inspector” means a person certified as an electrical inspector upon such reasonable conditions as may be adopted by the board. The board may recognize more than one class of electrical inspectors.

“*New electrical installation*” means the installation of electrical wiring, apparatus, and equipment for light, heat, power, and other purposes.

“*Public use building or facility*” means any building or facility designated for public use, including all property owned and occupied or designated for use by the state of Iowa.

“*Residential electrical work*” means electrical work in a residence in which there are no more than four living units within the same building and includes work to connect and work within accessory structures, which are structures no greater than 3,000 square feet in floor area, not more than two stories in height, the use of which is incidental to the use of the dwelling unit or units, and located on the same lot as the dwelling unit or units.

“*Routine maintenance*” means the repair or replacement of existing electrical apparatus or equipment of the same size and type for which no changes in wiring are made. Routine maintenance by itself does not require an electrical inspection.

“*Special electrician*” means a person having the necessary qualifications, training, and experience in wiring or installing special classes of electrical wiring, apparatus, equipment, or installations which shall include irrigation system wiring, disconnecting and reconnecting existing air conditioning and refrigeration, and sign installation and who is licensed by the board.

“*Unclassified person*” means any person, other than an apprentice electrician or other person licensed under this chapter, who, as such person's principal occupation, is engaged in learning and assisting in the installation, alteration, and repair of electrical wiring, apparatus, and equipment as an employee of a person licensed under this chapter, and who is licensed by the board as an unclassified person. For purposes of this chapter, persons who are not engaged in the installation, alteration, or repair of electrical wiring, apparatus, and equipment, either inside or outside buildings, shall not be considered unclassified persons.

“*Volunteer emergency service provider*” means a volunteer fire fighter as defined in Iowa Code section 85.61, a volunteer emergency rescue technician as defined in Iowa Code section 147A.1, or a reserve peace officer as defined in Iowa Code section 85.61.

[ARC 8396B, IAB 12/16/09, effective 2/1/10; ARC 9626B, IAB 7/27/11, effective 9/1/11; ARC 3733C, IAB 4/11/18, effective 3/26/18]

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CHAPTER 552
ELECTRICAL INSPECTION PROGRAM—PERMITS AND INSPECTIONS

661—552.1(103) Required permits and inspections.

552.1(1) Permits and inspections are required for any of the following electrical installations that are initiated on or after February 1, 2009:

a. All new electrical installations for commercial or industrial applications, including installations both inside and outside buildings, and for public-use buildings and facilities and any installation at the request of the owner.

b. All new electrical installations for residential applications in excess of single-family residential applications.

c. All new electrical installations for single-family residential applications requiring new electrical service equipment.

d. Any existing electrical installation observed during inspection which constitutes an electrical hazard. Existing installations shall not be deemed to constitute electrical hazards if the wiring was originally installed in accordance with the electrical code in force at the time of installation and has been maintained in that condition.

e. Inspections of alarm system installations, rules for which are intended to be adopted as new 661—Chapter 560.

EXCEPTION 1: Installations in political subdivisions which perform electrical inspections and which are inspected by the political subdivision are not required to be inspected by the state electrical inspection program. Any installation which is subject to inspection and is on property owned by the state or an agency of the state shall be inspected by the state electrical inspection program. An electrical installation on a farm which is located outside the corporate limits of any municipal corporation (city) shall not be inspected by a political subdivision.

EXCEPTION 2: Any electrical work which is limited to routine maintenance shall not require an inspection.

EXCEPTION 3: Neither a permit nor an inspection is required for an electrical installation which meets all of the following criteria:

1. The installation is legally performed by a master electrician, journeyman electrician, or apprentice electrician working under the direct supervision of a master or journeyman electrician.

2. The installation to be performed does not in any way involve work within an existing or new switchboard or panel board.

3. The installation to be performed does not involve over-current protection of more than 30 amperes.

4. The installation to be performed does not involve any electrical line-to-ground circuit of more than 277 volts, single phase.

EXCEPTION 4: Neither a permit nor an inspection is required for any electrical installation on a farm or a farm building if the farm building is not regularly open to the public as a place of business for the retail sale of goods, wares, services, or merchandise. This exception does not apply to a residential installation located on a farm.

552.1(2) The owner of a property on which multiple electrical installations may be performed during a 12-month period may apply for an annual permit to cover all such installations. The holder of an annual permit shall maintain a log of all installations performed pursuant to the annual permit. The owner shall cause the electrical inspection program to be notified of any such installation requiring an inspection and shall be subject to fees for such inspections as though an individual permit had been issued for each installation requiring an inspection. The fee for an annual permit shall be \$100. The log shall be available to an electrical inspector on the request of the inspector.

[ARC 8396B, IAB 12/16/09, effective 2/1/10; ARC 3733C, IAB 4/11/18, effective 3/26/18]

661—552.2(103) Request for inspection. Prior to commencement of any electrical installation requiring an inspection, the person making such installation shall notify the electrical inspection

program of the installation by applying for a permit, unless the installation is covered by an annual permit issued pursuant to subrule 552.1(2), and shall request an inspection of the installation through one of the following methods:

552.2(1) An inspection may be requested by completing and electronically submitting a Request for Permit form, available on the Web site of the electrical inspection program. Payment of the permit and inspection fees shall be submitted with the form in accordance with the instructions on the electrical inspection section Web site.

NOTE: The Web site to obtain, complete, and submit a Request for Permit form is, as of October 29, 2008: www.dps.state.ia.us/fm/electrical/inspection/.

552.2(2) An inspection may be requested by completing a Request for Inspection form and mailing it to the electrical inspection section as provided in rule 661—550.2(103). The Request for Inspection form may be obtained upon request to the electrical inspection section or from the Web site of the electrical inspection program. If a Request for Inspection form is submitted by mail, it shall be postmarked no less than seven days prior to the commencement of the installation.

552.2(3) An inspection may be requested by completing a Request for Inspection form and submitting it by fax transmission to the electrical inspection section at (515)725-6151. The Request for Inspection form may be obtained upon request to the electrical inspection section or from the Web site of the electrical inspection program.

552.2(4) Modification of permits and failure to pay inspection fees. Inspection fees will normally be paid at the time a permit is obtained. However, additional fees may apply if a permit is modified by an inspector, based upon inspection of the electrical installation. The person who obtained the original permit shall be notified immediately by the inspector of the modification and of the amount of any additional fees which are due. Any additional fees shall be due at the time the person responsible for payment receives notification of modification of the permit.

a. If an additional fee or portion of the fee is more than 60 days past due, the staff of the board shall notify the person responsible for payment of the fee of the necessity of promptly making the payment.

b. If an additional fee or portion of the fee is more than 120 days past due, the secretary of the board may suspend the ability of the person responsible for the payment to obtain inspection permits. The secretary shall restore the person's ability to obtain permits when payment of the past due amount has been received. Suspension of a person's ability to obtain permits may be appealed to the board as provided in rule 661—503.4(103).

c. If payment of a fee or portion of a fee is more than 180 days past due, the board may refer the debt for collection to the department of revenue pursuant to Iowa Code chapter 272D.

[ARC 8396B, IAB 12/16/09, effective 2/1/10; ARC 0120C, IAB 5/16/12, effective 7/1/12]

661—552.3(103) Scheduling of inspections. Subject to the availability of electrical inspectors, the electrical inspector whose territory includes the location of a requested inspection shall schedule the requested inspection to be completed within three business days of the receipt of the request. If an inspection for which a timely request has been made is not completed within three business days of the completion of the installation, a licensee who completed the installation may energize any new circuits included in the installation, although the installation remains subject to condemnation and disconnection if found to be out of compliance with any applicable provision of 661—Chapter 504 when inspected.

661—552.4(103) Report of inspection. After the completion of an inspection, the inspector shall issue an inspection report on a form prescribed by the board. The report shall indicate the results of the inspection, which may be any of the following:

552.4(1) Approval. If the inspector finds that the installation is in compliance with applicable requirements, the inspector shall issue a report indicating that the installation is approved.

552.4(2) Order of correction. If the inspector finds that the installation is not in compliance with applicable requirements but does not present an imminent threat to the health or safety of any person, the inspector shall issue an order of correction, prescribing a time frame during which corrective action shall be taken by the licensee responsible for the installation to bring the installation fully into compliance.

552.4(3) Order of disconnection. If the inspector finds that the installation is not in compliance with applicable requirements and presents an imminent threat to the health or safety of any person, the inspector shall issue an order of disconnection, requiring that the installation be disconnected until corrective action has been taken which brings the installation into full compliance with applicable requirements. The installation shall not be reconnected until corrective action has been completed and the corrected installation has been approved by an inspector as in compliance with all applicable requirements. The inspector issuing an order of disconnection shall notify the utility providing electrical service to the location of the order and shall notify the utility when the order of disconnection is no longer effective.

661—552.5(103) Appeals. An order of correction or an order of disconnection may be appealed. However, an order of disconnection shall be complied with immediately, and the installation shall not be reconnected pending the outcome of the appeal.

552.5(1) A person who has received an order of correction or disconnection may request an informal appeal to the chief electrical inspector within 14 days of receiving the order by contacting the electrical inspection section by telephone, fax, E-mail, or mail. The informal appeal may be heard in any manner agreed to by the person filing the appeal and the chief electrical inspector. If the order is upheld by the chief electrical inspector, the person receiving the order may file a formal appeal pursuant to subrule 552.5(2).

552.5(2) A person who has received an order of correction or disconnection may file a request for a formal appeal to the board within 30 days of receiving the order or, if the person has filed a request for an informal appeal, within 30 days of having been notified that the chief electrical inspector has upheld the order. Formal appeals shall be processed as provided in 661—Chapter 10, except that wherever “commissioner” or “department of public safety” appears in those rules, “electrical examining board” shall be substituted.

These rules are intended to implement 2007 Iowa Acts, chapter 197.

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CHAPTER 41
DETERMINATION OF TAXABLE INCOME
[Prior to 12/17/86, Revenue Department[730]]

701—41.1(422) Verification of deductions required. Deductions from gross income, otherwise allowable, will not be allowed in cases where the department requests the taxpayer to furnish information sufficient to enable it to determine the validity and correctness of such deductions, until such information is furnished. For taxpayers using an electronic data interchange process or technology also see 701—subrule 11.4(4).

This rule is intended to implement Iowa Code section 422.25.

701—41.2(422) Federal rulings and regulations. In determining whether “taxable income,” “net operating loss deduction” or any other deductions are computed for federal tax purposes under, or have the same meaning as provided by, the Internal Revenue Code, the department will use applicable rulings and regulations that have been duly promulgated by the commissioner of internal revenue, unless the director has created rules and regulations or has exercised discretionary powers as prescribed by statute which calls for an alternative method for determining “taxable income,” “net operating loss deduction” or any other deduction, or unless the department finds that an applicable internal revenue ruling or regulation is unauthorized according to the Iowa Code.

This rule is intended to implement Iowa Code sections 422.7 and 422.9.

701—41.3(422) Federal income tax deduction and federal refund. Federal income taxes paid or accrued during the tax year are a permissible deduction for Iowa income tax purposes, adjusted by any federal refunds received or accrued during the tax year. Taxpayers who are not on an accrual basis of accounting shall deduct their federal income taxes in the year paid.

41.3(1) Federal income tax deduction. The federal income tax deduction for cash basis taxpayers equals the sum of the following:

a. The entire amount of federal income tax withheld during the taxable year from compensation of the taxpayer. Where a husband and wife file separate returns or separately on a combined Iowa return, the actual federal income tax withheld from wages earned by either spouse or both spouses must be deducted by each in accordance with wage statement(s) and may not be prorated between the spouses.

b. Tax paid at any time during the taxable year on a filing of federal estimated tax or on any amendment to such filing. Where a husband and wife file separate Iowa returns or separately on a combined Iowa return, the federal estimated tax payments made in the tax year shall be prorated between the spouses by the ratio of each spouse’s income not subject to withholding to the total income not subject to withholding of both spouses, including the federal estimated tax payment made in January of the tax year which was made for the prior tax year. If an estimated tax payment or portion of the payment is made for self-employment tax, then the spouse who has earned the self-employment income shall report the amount of estimated tax designated as self-employment tax. The federal tax deduction for the tax year does not include the self-employment tax paid through the federal estimated payments made in the tax year. In addition, the federal tax deduction does not include the additional .9 percent Medicare tax computed under Section 3101(b)(2) of the Internal Revenue Code for tax years beginning on or after January 1, 2013. However, one-half of the self-employment tax paid in the tax year is deductible in computing federal adjusted gross income pursuant to Section 164(f) of the Internal Revenue Code, so this self-employment tax is also deductible in computing net income. If an estimated tax payment or portion of the payment is made for the federal net investment income tax computed under Section 1411 of the Internal Revenue Code for tax years beginning on or after January 1, 2013, see paragraph 41.3(1) “f” on how the federal net income tax should be prorated between spouses.

c. Any additional federal tax on a prior federal return paid during the taxable year. Where a husband and wife file separately or separately on a combined Iowa return, additional federal tax paid shall be prorated between the spouses by the ratio of net income reported by each spouse to total net income of both spouses in the year for which the additional federal tax was paid. If additional federal tax

paid includes federal self-employment tax, then that amount of self-employment tax shall be deducted by the spouse who earned the self-employment income. Any federal tax paid for a tax year in which an Iowa individual income tax return was not required to be filed is not allowed as a deduction in the year the federal taxes were paid. If additional federal tax paid includes the federal net investment income tax computed under Section 1411 of the Internal Revenue Code for tax years beginning on or after January 1, 2013, see paragraph 41.3(1)“f” on how the federal net income tax should be prorated between spouses.

EXAMPLE 1. Individual A earned \$8,500 in income for the 2004 tax year and paid \$200 in federal tax with the filing of the federal return in 2005. Individual A was not required to file an Iowa return for 2004 because the Iowa net income was under \$9,000. Individual A cannot claim a deduction for the \$200 in federal tax paid on the 2005 Iowa return because an Iowa return was not required to be filed for the 2004 tax year.

EXAMPLE 2. Individual B moved into Iowa on January 1, 2005, and filed an initial Iowa individual income tax return for the 2005 tax year. Individual B paid \$1,000 in additional federal income tax with the filing of the 2004 federal income tax return in 2005. Individual B cannot claim a deduction for the \$1,000 in federal tax paid on the 2005 Iowa return because an Iowa return was not filed for the 2004 tax year.

d. The earned income credit computed under Section 32 of the Internal Revenue Code and the additional child tax credit computed under Section 24(d) of the Internal Revenue Code, to the extent that these credits reduce the federal income tax liability on the prior federal return filed during the taxable year. Where a husband and wife file separately or separately on a combined Iowa return, the earned income credit and the additional child tax credit shall be prorated between the spouses by the ratio of net income reported by each spouse to total net income of both spouses in the year for which these credits were claimed.

EXAMPLE: Individual A filed a 2003 federal income tax return reporting a tax liability of \$2,000. Individual A had \$500 of federal income tax withheld and \$2,500 of earned income credit. Individual A can deduct \$500 as a federal income tax deduction on the Iowa return for 2003 and \$1,500 as a federal tax deduction on the Iowa return for 2004, since the federal tax deduction is limited to the extent it reduced the federal income tax liability.

e. The motor vehicle fuel tax credit computed under Section 34 of the Internal Revenue Code for the taxable year. Where a husband and wife file separately or separately on a combined Iowa return, the motor vehicle fuel tax credit shall be prorated between the spouses by the ratio of net income reported by each spouse to total net income of both spouses in the year for which these credits were claimed.

EXAMPLE: Individual B filed a 2003 federal income tax return reporting a tax liability of \$1,500. Individual B paid \$1,000 in federal estimated tax during 2003 and claimed a \$400 motor vehicle fuel tax credit on the 2003 federal return. Individual B can deduct \$1,400 as a federal income tax deduction on the Iowa return for 2003.

f. For tax years beginning on or after January 1, 2013, the federal net investment income tax, also known as the unearned income Medicare contribution tax, computed under Section 1411 of the Internal Revenue Code. The federal net investment income tax is computed on the lesser of net investment income for the tax year or the excess of the modified adjusted gross income for the tax year over a threshold amount.

Where a married couple file separate returns or separately on a combined Iowa return, the federal net investment income tax, if computed on net investment income, shall be prorated between the spouses by the ratio of net investment income reported by each spouse to total net investment income of both spouses in the year for which the federal net investment income tax was paid. Where a married couple file separate returns or separately on a combined Iowa return, the federal net investment income tax, if computed on the excess of modified adjusted gross income over a threshold amount, shall be prorated between the spouses by the ratio of net income reported by each spouse to total net income of both spouses in the year for which the federal net investment income tax was paid.

41.3(2) Federal income tax refunds.

a. Any refund of federal income tax received during the taxable year must be used to reduce the amount deducted for federal income tax to the extent the refunded amount was deducted on the

Iowa return in a prior year. When a husband and wife file separately or separately on a combined Iowa return, the federal income tax refund to be reported shall be prorated between the spouses by the ratio of net income reported by each spouse to total net income reported by both spouses. If an amount of self-employment tax is required to be added back to Iowa net income, then the spouse who earned the self-employment income which generated the self-employment tax shall report that amount as an addition to net income. Any federal tax refund received for a tax year in which an Iowa individual income tax return was not required to be filed is not required to be reported in the year the federal refund was received.

EXAMPLE 1: Individual A earned \$7,500 in income for the 2004 tax year and had \$1,000 in federal income tax withheld. Individual A received a refund of the entire \$1,000 federal tax withheld with the filing of the federal return in 2005. Individual A was not required to file an Iowa return for 2004 because the Iowa net income was under \$9,000. Individual A does not have to report the \$1,000 federal refund received on the 2005 Iowa return because an Iowa return was not required to be filed for the 2004 tax year.

EXAMPLE 2: Individual B moved into Iowa on July 1, 2005, and filed an initial Iowa individual income tax return for the 2005 tax year. Individual B received a \$2,000 federal income tax refund with the filing of the 2004 federal income tax return in 2005. Individual B does not have to report the \$2,000 federal refund on the 2005 Iowa return because an Iowa return was not filed for the 2004 tax year.

b. Any portion of the federal refund received due to the earned income credit computed under Section 32 of the Internal Revenue Code or the additional child tax credit computed under Section 24(d) of the Internal Revenue Code does not have to be reported on the Iowa return. However, any portion of the federal refund received due to the motor vehicle fuel tax credit computed under Section 34 of the Internal Revenue Code does have to be reported on the Iowa return.

EXAMPLE 1: Individual A filed a 2003 federal income tax return reporting a tax liability of \$2,000. Individual A had \$500 of federal income tax withheld and \$2,500 of earned income credit and received a federal income tax refund of \$1,000 after filing the return in 2004. Individual A does not have to report the \$1,000 federal refund on the Iowa return for 2004, since the refund resulted from the earned income credit.

EXAMPLE 2: Individual B filed a 2003 federal income tax return reporting a tax liability of \$500. Individual B had \$1,000 of federal income tax withheld and \$1,000 of earned income credit and received a federal income tax refund of \$1,500 after filing the return in 2004. Individual B must report a \$500 federal refund on the Iowa return for 2004, since the portion of the refund relating to the earned income credit does not have to be reported.

EXAMPLE 3: Individual C filed a 2003 federal income tax return reporting a tax liability of \$1,000. Individual C paid \$900 in federal estimated tax and claimed a \$400 federal motor vehicle fuel tax credit and received a federal refund of \$300 after filing the return in 2004. Individual C must report the \$300 federal refund on the Iowa return for 2004, since the refund resulted from the motor vehicle fuel tax credit.

c. Any portion of the federal refund received due to the first-time homebuyer credit computed under Section 36 of the Internal Revenue Code does not have to be reported on the Iowa return. Similarly, any recapture of the credit under Section 36(f) of the Internal Revenue Code is not allowed as a deduction for federal taxes paid.

EXAMPLE: Individual A filed a 2008 federal income tax return reporting a tax liability of \$1,000. Individual A had \$1,200 of federal tax withheld and \$7,500 of first-time homebuyer credit and received a federal income tax refund of \$7,700 after filing the return in 2009. Individual A must report a \$200 federal refund on the Iowa return for 2009, since the portion of the federal refund relating to the first-time homebuyer credit does not have to be reported. The \$500 of federal taxes that will be recaptured and paid for each year on the federal income tax return for 2009-2023 in accordance with Section 36(f) of the Internal Revenue Code will not be allowed as a deduction on the Iowa return for federal taxes paid.

41.3(3) *Federal income tax deduction—part-year residents.*

a. For tax years beginning on or before December 31, 1981, the federal income tax deduction attributable to Iowa by part-year residents shall be determined by multiplying the federal tax paid or

accrued for the entire taxable year by a fraction, the numerator of which is the Iowa net income and the denominator of which is the federal adjusted gross income except that the taxpayer can deduct actual federal income tax withheld on that income subject to withholding which was earned while the taxpayer was an Iowa resident if the federal tax withheld on the Iowa income is separately shown on the wage statement(s) of the taxpayer.

b. For tax years beginning on or after January 1, 1982, the federal income tax deduction attributable to Iowa by part-year residents shall be the same deduction as is available for resident taxpayers.

41.3(4) *Federal income tax deduction—nonresidents.*

a. For tax years beginning on or before December 31, 1981, the federal income tax deduction attributable to Iowa by nonresidents shall be determined by multiplying the federal tax paid or accrued for the entire taxable year by a fraction, the numerator of which is the Iowa net income and denominator of which is the federal adjusted gross income.

If separate Iowa nonresident returns are filed by a husband and wife who filed a joint federal return, each spouse's Iowa adjusted gross income must be divided by the total federal net income of both spouses in order to compute a ratio that can be used to determine the federal tax deduction attributable to each spouse. In any event, the ratio including the combined ratio of husband and wife cannot exceed 100 percent.

Federal income taxes paid during the taxable year on prior years' federal income tax returns will not be allowable on the nonresident return for the taxable year unless Iowa returns were filed for the prior years for which the federal taxes were paid.

Any federal income tax, either paid by a nonresident or withheld from their compensation, which is later refunded to the taxpayer, shall be included as Iowa income by the nonresident for the year the refund is received, in the same portion that such federal tax was deducted by the nonresident in a prior Iowa income tax return.

b. For tax years beginning on or after January 1, 1982, the federal income tax deduction attributable to Iowa by nonresidents of Iowa shall be the same deduction as is available for resident taxpayers.

41.3(5) *Federal rebate received in 2001.* Rescinded IAB 10/16/13, effective 11/20/13.

41.3(6) *Federal rate reduction credit and the federal income tax deduction for the 2002 tax year.* Rescinded IAB 10/16/13, effective 11/20/13.

41.3(7) *Federal rebate received in 2008.* For tax years beginning in the 2008 calendar year, the federal tax rebate or advanced refund of federal income tax provided to certain individuals in 2008 pursuant to the federal Economic Stimulus Act of 2008 is not to be included as part of an individual's federal income tax refund for the individual's federal tax deduction for Iowa individual income tax purposes.

EXAMPLE. Frank and Jane Casey received a federal refund of \$1,300 in March 2008 from federal income tax that had been deducted on their 2007 Iowa individual income tax return. Frank and Jane also received a \$1,200 federal rebate in June 2008. When Frank and Jane file their 2008 Iowa return, they must report a federal income tax refund of \$1,300. However, they are not required to include as part of the federal income tax refund shown on their 2008 Iowa return the \$1,200 federal rebate they received in June 2008.

41.3(8) *Federal rate reduction credit and the federal income tax deduction for the 2009 tax year.* For tax years beginning in the 2009 calendar year, the tax reduction credit or the advanced refund of federal income tax provided to certain individuals pursuant to the federal Economic Stimulus Act of 2008 is to be included as part of an individual's federal income tax refund for Iowa individual income tax purposes. The tax reduction credit was also referred to as the federal rebate when it was refunded to some taxpayers during the 2008 calendar year. This subrule does not apply to those taxpayers who received the federal rebate in the 2008 calendar year.

EXAMPLE: When Fred and Barbara Jones completed their 2008 federal income tax return, they received the benefit of a rate reduction credit of \$1,200, which resulted in the Browns' receiving a

federal income tax refund of \$1,300 in May 2009. Fred and Barbara need to report the entire \$1,300 refund of federal income tax when they complete their Iowa income tax return for 2009.

This rule is intended to implement Iowa Code section 422.9 as amended by 2008 Iowa Acts, House File 2417.

[**ARC 8589B**, IAB 3/10/10, effective 4/14/10; **ARC 1101C**, IAB 10/16/13, effective 11/20/13; **ARC 1303C**, IAB 2/5/14, effective 3/12/14; **ARC 1665C**, IAB 10/15/14, effective 11/19/14]

701—41.4(422) Optional standard deduction. An optional standard deduction is provided on the Iowa individual income tax return for both residents and nonresidents. In the case of married taxpayers filing separate returns or separately on the combined return, if one spouse takes the optional standard deduction, the other spouse must also take the optional standard deduction. The standard deduction claimed by the taxpayer may not exceed the taxpayer's income before the standard deduction.

A taxpayer has the option of itemizing deductions or of using the optional standard deduction on the Iowa return, regardless of the deduction method used on the federal return.

For tax years beginning on or after January 1, 1990, the optional standard deduction amounts are indexed or increased for inflation by the cumulative standard deduction factor. The cumulative standard deduction factor is described in rule 701—38.12(422).

41.4(1) *Direct charitable contribution for individuals claiming the optional standard deduction.* Rescinded IAB 3/26/08, effective 4/30/08.

41.4(2) Reserved.

This rule is intended to implement Iowa Code sections 422.4 and 422.9.

701—41.5(422) Itemized deductions. Deductions may be itemized on the Iowa return to the same extent that they are allowable on the federal return with the following exceptions:

41.5(1) To the extent that Iowa income taxes were included in itemized deductions allowable for federal income tax purposes, they must be subtracted from the itemized deductions to be deducted on the Iowa return.

41.5(2) For the tax years beginning on or after January 1, 2004, and before January 1, 2008, and for tax years beginning on or after January 1, 2010, but before January 1, 2014, the itemized deduction for state sales and use taxes is allowed on the Iowa return only if the taxpayer elected to deduct state sales and use taxes as an itemized deduction in lieu of the deduction for state income taxes on the federal return under Section 164 of the Internal Revenue Code.

If the taxpayer elected to deduct state income taxes as an itemized deduction on the federal return, taxpayer cannot claim an itemized deduction for state sales and use taxes on the Iowa return. In addition, if taxpayer claimed the standard deduction in accordance with Section 63 of the Internal Revenue Code on the federal return, taxpayer cannot claim an itemized deduction for state sales and use taxes on the Iowa return.

If the taxpayer is allowed to deduct state sales and use taxes as an itemized deduction on the Iowa return, taxpayer cannot claim an itemized deduction on the Iowa return for either the school district surtax imposed under Iowa Code section 257.21 or the emergency medical services income surtax imposed under Iowa Code chapter 422D.

41.5(3) Adoption expense deduction. Unreimbursed amounts paid by the taxpayer in the adoption of a child if placed by an adoption service provider under Iowa Code chapter 600, which exceed 3 percent of the taxpayer's net income, or the combined net income of a husband and wife in the case of married taxpayers filing a joint return, will be allowed as a deduction in the year paid. Qualifying expenses include all medical, hospital, legal fees, welfare agency fees, and all other costs relating to the adoption of a child. Those expenses claimed for adoption purposes may not be claimed elsewhere on the individual income tax return for tax years beginning before January 1, 2014. For tax years beginning on or after January 1, 2014, an adoption tax credit equal to certain qualified adoption expenses can be claimed in accordance with rule 701—42.52(422), but the expenses claimed for the credit cannot be allowed as a deduction under this subrule.

EXAMPLE: The Joneses, a married couple whose combined net income for 2014 is \$100,000, incur \$6,000 of qualified adoption expenses and claim a \$2,500 adoption tax credit in accordance with rule

701—42.52(422). The amount of expenses in excess of 3 percent of their combined net income is \$3,000. Since the taxpayers claimed a \$2,500 adoption tax credit, only \$500 of expenses is eligible for the deduction.

41.5(4) Deduction for expenses for the care of certain disabled relatives.

a. For tax years beginning on or after January 1, 1983, a deduction from net income may be taken for expenses incurred by a taxpayer for care of a disabled person who is unable to live independently. Such care must be provided in the home in which the taxpayer resides throughout the year. A person is considered to be incapable of living independently if as a result of a physical or mental defect the person is incapable of caring for the person's hygienical or nutritional needs or requires the full-time attention of another person for personal safety or the safety of others. The fact that an individual, by reason of a physical or mental defect, is unable to engage in any substantial gainful activity, or is unable to perform the normal household functions of a homemaker or to care for minor children, does not of itself establish that the individual is physically or mentally incapable of self-care. An individual who is physically handicapped or is mentally defective, and for such reason requires the constant attention of another person, is considered to be physically or mentally incapable of self-care.

To qualify for the deduction, in addition to being disabled, the person must be the grandchild, child, parent or grandparent of the taxpayer or the taxpayer's spouse, and

- (1) Be receiving medical assistance benefits under Iowa Code chapter 249A; or
- (2) Be eligible to receive such benefits under the income and resource levels established in Iowa Code chapter 239B; or
- (3) Would be eligible to receive such benefits if living in a health-care facility licensed under Iowa Code chapter 135C.

Expenses incurred for a taxpayer's disabled spouse do not qualify for the deduction.

b. The deductible amount is limited to \$5,000 for each disabled person cared for in the taxpayer's home and the expenses must not be otherwise deductible as a deduction from net income under Iowa Code section 422.9.

c. Qualifying expenses include a proportionate share of food expenses as well as amounts spent directly on the disabled person for such items as clothing, medical care, dental care and transportation.

Medical expenses incurred for a disabled relative, which are eliminated from federal itemized deductions because of the federal adjusted gross income percentage limitation, may be included in the deduction for expenses incurred for the care of the disabled relative providing the other requirements are met. Following are examples to illustrate the portion of medical expenses incurred which would be deductible.

EXAMPLE 1. Mr. and Mrs. Smith care for Mrs. Smith's mother in their home. Mrs. Smith's mother is physically unable to live independently and qualifies for medical assistance benefits under Iowa Code chapter 249A. Mr. and Mrs. Smith paid medical expenses of \$1,500 for themselves and \$500 for Mrs. Smith's mother. The medical expenses for Mrs. Smith's mother are includable as federal itemized deductions. Mr. and Mrs. Smith's federal adjusted gross income is \$20,000. For 1983, the federal deduction for medical expenses would be \$1,000 (\$2,000 minus 5 percent of \$20,000 or \$1,000). Since the deductible amount for federal tax purposes is \$1,000 or 50 percent of the total medical expenses of Mr. and Mrs. Smith and Mrs. Smith's mother, there remains 50 percent of the \$500 expense for Mrs. Smith's mother (or \$250) which can be included in the Iowa deduction for a disabled relative.

EXAMPLE 2. Mr. and Mrs. Smith's medical expenses were \$400 and Mrs. Smith's mother's expenses were \$200. None of the \$600 in expenses would be deductible as a federal itemized deduction but the mother's \$200 in expenses would be includable in the Iowa deduction for expenses incurred for a disabled relative.

d. Expenses not directly related to care of a disabled relative are not deductible. This category includes rent, mortgage interest, utilities, house insurance and taxes. Such expenses would be incurred without the disabled relative in the home and unless an expense can be directly attributed to the disabled relative, it may not be deducted.

e. In the event that the person being cared for is receiving assistance benefits under Iowa Code chapter 239B, the expenses qualifying for deduction shall be the net difference between the expenses

actually incurred in caring for the person which are not otherwise deductible as a deduction to net income and the assistance benefits under Iowa Code chapter 239B. Iowa Code chapter 239B covers family investment program payments.

f. In order to claim a deduction for expenses for care of a disabled relative, a schedule of qualifying expenses must be provided with the tax return as well as a statement from a qualified physician certifying that the disabled individual is unable to live independently. Such certification must be filed with the tax return in the initial year for the deduction and every third year thereafter.

41.5(5) Rescinded IAB 5/6/09, effective 6/10/09.

41.5(6) Rescinded IAB 11/24/04, effective 12/29/04.

41.5(7) Deduction of multipurpose vehicle registration fee. For tax years beginning on or after January 1, 1992, and before January 1, 2005, individuals who itemize deductions for Iowa income tax purposes may claim a deduction for 60 percent of the amount of the registration fee paid for a multipurpose vehicle under Iowa Code section 321.124, subsection 3, paragraph “h.” “Multipurpose vehicle” means a motor vehicle designed to carry not more than ten people and constructed either on a truck chassis or with special features for occasional off-road operation. The registration certificate for a multipurpose vehicle has the letters “MV” printed next to the word “style” on the certificate.

This subrule applies only to model year 1992 and older model year multipurpose vehicles. The registration fees for multipurpose vehicles for the 1993 model year and for model years after 1993 are the same as for other motor vehicles where the fees for newer model year vehicles are based on the value and weight of the vehicle. In order to qualify for this deduction, no part of the multipurpose vehicle registration fee may have been deducted as an itemized deduction under Section 164 of the Internal Revenue Code or as an ordinary and necessary business expense.

See also subrule 41.5(9), which provides for the deduction for registration fees for older motor vehicles. Subrule 41.5(7) also applies to multipurpose vehicles to the extent those vehicles are for the 1993 model year or for model years after 1993.

For tax years beginning on or after January 1, 2005, the itemized deduction for Iowa income tax for multipurpose vehicle registration fees is the same as allowed under Section 164 of the Internal Revenue Code for federal tax purposes.

41.5(8) Medical expense deduction limitation. For tax years beginning on or after January 1, 1996, to the extent that a taxpayer has a medical care expense deduction on the federal return under Section 213 of the Internal Revenue Code, the taxpayer must compute the medical care expense deduction on the Iowa return by excluding those health insurance premiums deducted in computing net income in accordance with Iowa Code subsection 422.7(29) and rule 701—40.48(422).

41.5(9) Deduction of older motor vehicle registration fee. For tax years beginning on or after January 1, 2002, and before January 1, 2005, individuals who itemize deductions for Iowa income tax purposes may claim a deduction for 60 percent of the annual registration fee paid for certain older motor vehicles. This deduction applies to a 1994 model year vehicle or a newer model year vehicle that is nine model years old or older. This deduction also applies to a 1993 or older motor vehicle which has been transferred to a new owner or to a 1993 or older model vehicle that was brought into Iowa on or after January 1, 2002. However, the deduction otherwise allowed pursuant to this subrule is not allowed to the extent that the vehicle was used in the taxpayer’s trade or business so that the deduction for the registration of the vehicle has already been allowed in the computation of Iowa net income.

For tax years beginning on or after January 1, 2005, the itemized deduction for Iowa income tax for older motor vehicle registration fees is the same as allowed under Section 164 of the Internal Revenue Code for federal tax purposes.

41.5(10) Additional first-year depreciation allowance. For tax periods ending on or after September 10, 2001, any federal itemized deductions that are determined based on a percentage of a taxpayer’s federal adjusted gross income may have to be adjusted for Iowa tax purposes. These itemized deductions for Iowa individual tax purposes are based on federal adjusted gross income as adjusted by the disallowance of the additional first-year depreciation allowance authorized in Section 168(k) of the Internal Revenue Code as described in rule 701—40.60(422).

EXAMPLE: Mr. and Mrs. Jones reported \$50,000 in federal adjusted gross income on their 2002 federal income tax return. Mr. and Mrs. Jones paid medical expenses of \$5,000 for 2002, but could only claim an itemized deduction for medical expenses for federal tax purposes equal to \$1,250, or to the extent the medical expenses exceeded 7.5 percent of their federal adjusted gross income (\$50,000 times 7.5% = \$3,750. \$5,000 - \$3,750 = \$1,250). Mr. and Mrs. Jones reported a \$5,000 increase in Iowa adjusted gross income due to the disallowance of additional first-year depreciation on their Iowa return for 2002. Mr. and Mrs. Jones can claim an itemized deduction on the 2002 Iowa return for medical expenses of \$875, or to the extent the medical expenses exceeded 7.5 percent of their adjusted gross income for Iowa purposes of \$55,000 (\$55,000 times 7.5% = \$4,125. \$5,000 - \$4,125 = \$875).

41.5(11) Charitable contributions made in January 2005 for relief of victims of the Indian Ocean tsunami. For cash contributions made after December 31, 2004, and before February 1, 2005, to charitable organizations for the purpose of helping victims of the Indian Ocean tsunami, the taxpayer may claim this contribution as an itemized deduction on the 2004 Iowa income tax return if the taxpayer elected to claim this contribution as an itemized deduction on the 2004 federal tax return. If the taxpayer elected to claim the cash contribution made in January 2005 as an itemized deduction on the 2005 federal tax return, then it must be claimed as an itemized deduction on the 2005 Iowa return.

41.5(12) Medical expense deduction for certain unreimbursed expenses relating to a human organ transplant. For tax years beginning on or after January 1, 2005, a taxpayer who claims a deduction for unreimbursed travel and lodging expenses relating to a human organ transplant in accordance with rule 701—40.66(422) cannot claim an itemized deduction for medical expenses under Section 213(d) of the Internal Revenue Code for these same expenses for Iowa tax purposes.

41.5(13) Charitable contributions relating to the injured veterans grant program. For tax years beginning on or after January 1, 2006, a taxpayer who claims a deduction for contributions to the injured veterans grant program in accordance with 701—subrule 40.68(2) cannot claim an itemized deduction for charitable contributions under Section 170 of the Internal Revenue Code for the same contribution for Iowa tax purposes.

41.5(14) Charitable contributions relating to school tuition organizations. For tax years beginning on or after January 1, 2006, a taxpayer who claims a school tuition organization tax credit in accordance with rule 701—42.32(422) cannot claim an itemized deduction for charitable contributions under Section 170 of the Internal Revenue Code for the amount of the contribution to the school tuition organization for Iowa tax purposes.

41.5(15) Charitable contributions relating to the charitable conservation contribution tax credit. For tax years beginning on or after January 1, 2008, a taxpayer who claims a charitable conservation contribution tax credit in accordance with rule 701—42.40(422) cannot claim an itemized deduction for charitable contributions for the amount of the contribution for which the tax credit is claimed. See 701—subrule 42.40(2) for examples illustrating how this subrule is applied.

41.5(16) Charitable contributions relating to the endow Iowa tax credit. For tax years beginning on or after January 1, 2010, a taxpayer who claims an endow Iowa tax credit in accordance with rule 701—42.24(15I,422) cannot claim an itemized deduction for charitable contributions under Section 170 of the Internal Revenue Code for the amount of the contribution for which the tax credit is claimed for Iowa tax purposes.

41.5(17) Charitable contributions relating to the from farm to food donation tax credit. For tax years beginning on or after January 1, 2014, a taxpayer who claims a from farm to food donation tax credit in accordance with rule 701—42.51(422,85GA,SF452) cannot claim an itemized deduction for charitable contributions under Section 170 of the Internal Revenue Code for the amount of the contribution for which the tax credit is claimed for Iowa tax purposes.

41.5(18) Charitable contributions relating to the Iowa education savings plan trust. For tax years beginning on or after January 1, 2016, certain qualifying organizations may establish Iowa education savings plan trust accounts as participants, as described in Iowa Code chapter 12D. Taxpayers may make charitable contributions to such qualifying organizations so that the organization can deposit the contribution into the organization's Iowa education savings plan trust account. However, for Iowa income tax purposes, a taxpayer must add back any portion of the federal charitable contribution

deduction allowed for a contribution to a qualifying organization, to the extent that the taxpayer designated that any part of such contribution be used for the direct benefit of the taxpayer's dependent or for the benefit of any other specific person chosen by the taxpayer.

This rule is intended to implement Iowa Code section 422.7 and section 422.9 as amended by 2014 Iowa Acts, House File 2468.

[ARC 7761B, IAB 5/6/09, effective 6/10/09; ARC 8589B, IAB 3/10/10, effective 4/14/10; ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9820B, IAB 11/2/11, effective 12/7/11; ARC 1101C, IAB 10/16/13, effective 11/20/13; ARC 1138C, IAB 10/30/13, effective 12/4/13; ARC 1665C, IAB 10/15/14, effective 11/19/14; ARC 3664C, IAB 2/28/18, effective 4/4/18; ARC 3749C, IAB 4/11/18, effective 5/16/18]

701—41.6(422) Itemized deductions—separate returns by spouses. Where both spouses itemize deductions, the deductions must be divided between them in the ratio that each spouse's separate Iowa net income bears to the total Iowa net income of both spouses unless each spouse can show that the spouse paid for or is entitled to accrue the deductions. It will be presumed that the deductions are paid by both spouses and must be prorated if the deductions were paid from a joint checking account of both spouses. In any event, all itemized deductions must either be prorated between spouses or must be specifically deducted by the spouse that paid for the deductions. No combinations of the two methods will be permitted.

This rule is intended to implement Iowa Code section 422.9.

701—41.7(422) Itemized deductions—part-year residents.

41.7(1) Rescinded IAB 3/26/08, effective 4/30/08.

41.7(2) For tax years beginning on or after January 1, 1982, itemized deductions attributable to Iowa by part-year residents shall be the itemized deductions allowable for resident taxpayers.

This rule is intended to implement Iowa Code sections 422.7, 422.8 and 422.9.

701—41.8(422) Itemized deductions—nonresidents.

41.8(1) Rescinded IAB 3/26/08, effective 4/30/08.

41.8(2) For tax years beginning on or after January 1, 1982, itemized deductions attributable to Iowa by nonresidents shall be the itemized deductions available for resident taxpayers.

This rule is intended to implement Iowa Code sections 422.5, 422.7 and 422.9.

701—41.9(422) Annualizing income. Where a taxpayer is required to annualize income for federal income tax purposes the taxpayer must also annualize on the Iowa return.

This rule is intended to implement Iowa Code section 422.7.

701—41.10(422) Income tax averaging. There is no provision in the Iowa Code which allows income tax averaging.

This rule is intended to implement Iowa Code sections 422.7 and 422.5.

701—41.11(422) Reduction in state itemized deductions for certain high-income taxpayers. For tax years beginning after December 31, 1990, the itemized deductions for certain high-income taxpayers are reduced for federal income tax purposes by the lesser of 3 percent of the excess of adjusted gross income (AGI) over the applicable amount, or 80 percent of the amount of itemized deductions otherwise allowable for the taxable year. For 1991, the applicable amount is \$100,000 (\$50,000 in the case of a married person filing a separate federal return). The applicable amount is to be increased each tax year to reflect inflation in the taxable years after 1991. For example, for 1995 the applicable amount is \$114,700 (\$57,350 in the case of a married person filing a separate return). This reduction in itemized deductions for certain high-income taxpayers applies for Iowa individual income tax purposes for the same tax years that the provision applies for federal income tax purposes. The following subrules clarify how the reduction in itemized deductions is to be determined on the Iowa individual income tax return:

41.11(1) Itemized deduction worksheet (Form 41-104). High-income taxpayers who are itemizing deductions on the Iowa income tax return and whose itemized deductions for federal income tax purposes were subject to reduction because their federal adjusted gross incomes exceeded certain amounts (the

amounts for 1996 were \$117,950 for all taxpayers except married taxpayers who filed separate federal returns and \$58,975 for married individuals who filed separate federal returns) must complete Itemized Deduction Worksheet (Form 41-104) to determine the amount of federal itemized deductions that can be claimed on the Iowa income tax return. This worksheet must also be used to compute the itemized deductions allowable on the Iowa return for taxpayers who claimed the standard deduction on their federal individual income tax return, but are itemizing deductions for Iowa income tax purposes and whose deductions would have been subject to reduction, if they had itemized deductions on their federal income tax return. These taxpayers must complete the worksheet (Form 41-104) as if they had itemized deductions on their federal returns. Generally, the itemized deductions allowed on the federal income tax return for high-income taxpayers are also allowed for Iowa individual income tax purposes, except that the Iowa income tax that was allowable as a deduction on the federal Schedule A is not allowed as an Iowa itemized deduction. In addition, the deduction for medical expenses claimed as an itemized deduction on the federal income tax return should be reduced by the amount of health insurance premiums claimed as a deduction on line 18 of the IA 1040. The line references on Form 41-104 are to the federal 1040 and to the federal Schedule A for 1996 and to the IA 1040 for the 1996 tax year. Similar line references will apply on Form 41-104 and to IA 1040 for any later tax year when the taxpayer's federal itemized deductions were subject to reduction because the taxpayer's federal adjusted gross income exceeded the threshold amount for that year and the taxpayer itemized deductions on the Iowa income tax return. Note that if a taxpayer's itemized deductions are less than the Iowa standard deduction amount, the taxpayer may elect to claim the Iowa standard deduction.

Form 41-104 follows:

- | | |
|--|------------|
| 1. Enter the allowable federal itemized deductions as shown on line 34 of the 1040. | 1. _____ |
| 2. Add the amounts on federal Schedule A, lines *4, 13, 19 plus any gambling losses including on line 27 and enter the total here. | 2. _____ |
| 3. Subtract line 2 amount from line 1 amount. | 3. _____ |
| 4. Add the amounts on federal Schedule A, lines *4, 9, 14, 18, 19, 26, and 27 and enter the total here. | 4. _____ |
| 5. Subtract line 2 amount from line 4 amount. | 5. _____ |
| 6. Divide line 3 by line 5 and enter percentage here. | 6. _____ % |
| 7. Enter the amount of Iowa income tax that is included in line 5 of the federal Schedule A. | 7. _____ |
| 8. Multiply line 7 by the percentage on line 6. | 8. _____ |
| 9. Subtract line 8 from line 1. Enter this amount here and on line 39 of the IA 1040. | 9. _____ |

*The deduction for medical expenses from line 4 of federal Schedule A must be reduced by the amount of any health insurance premiums that were deducted on line 18 of Form IA 1040 in computing the taxpayer's net income for the tax year.

41.11(2) *Possible problem with itemized deduction worksheets for 1992, 1993, and 1994 returns.* Rescinded IAB 3/26/08, effective 4/30/08.

This rule is intended to implement Iowa Code sections 422.3 and 422.9.

701—41.12(422) Deduction for home mortgage interest for taxpayers with mortgage interest credit. For tax years beginning on or after January 1, 1996, any taxpayer who had the mortgage interest credit on the federal return can claim a deduction on the Schedule A of the IA 1040 for all the mortgage interest paid in the tax year, including the mortgage interest that was not deducted on the federal return due to the mortgage interest credit.

This rule is intended to implement Iowa Code sections 422.3 and 422.9.

701—41.13(422) Iowa income taxes and Iowa tax refund. As provided in subrule 41.5(1), Iowa individual income taxes paid or accrued are allowable itemized deductions for federal income tax purposes, but are not allowable itemized deductions for Iowa income tax purposes. To the extent Iowa income taxes were deducted as itemized deductions for federal tax purposes, they shall be disallowed as an itemized deduction for Iowa income tax purposes.

Refunds of Iowa income taxes to the extent that the refunds were included in the determination of federal adjusted gross income shall be allowed as a reduction to Iowa adjusted gross income, only to the extent that an itemized deduction for Iowa income taxes was disallowed on a prior Iowa return. Iowa income tax refunds resulting from Iowa refundable income tax credits are not allowed as a reduction for Iowa income tax purposes.

EXAMPLE: Individual A made Iowa estimated payments of \$2,000 during the 2003 tax year. The \$2,000 of estimated payments was claimed as an itemized deduction for federal tax purposes, but was not allowed as an itemized deduction for Iowa tax purposes. The 2003 Iowa return reported a tax liability of \$1,600. Individual A had \$2,000 of Iowa estimated payments and a \$500 ethanol blended gasoline tax credit, and received a \$900 Iowa tax refund in 2004. Of the \$900 refund reported as income on the federal return, Individual A will be allowed a \$400 (\$2,000 - \$1,600) reduction on the Iowa return for 2004.

This rule is intended to implement Iowa Code section 422.9.

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◊ Two or more ARCs

CHAPTER 42
ADJUSTMENTS TO COMPUTED TAX AND TAX CREDITS
[Prior to 12/17/86, Revenue Department[730]]

701—42.1(257,422) School district surtax. Iowa law provides for the implementation of an income surtax for increasing local school district budgets. The surtax must be approved by the voters of a school district in a special election or by a resolution of the board of directors of a school district. The surtax rate is determined by the department of management on the basis of the revenue to be raised by the surtax for the particular school district with the surtax.

The school district surtax is imposed on the income tax liabilities of all taxpayers residing in the school district on the last day of the taxpayers' tax years. For purposes of the school district surtax, income tax liability is the tax computed under Iowa Code section 422.5, less the nonrefundable credits against computed tax which are authorized in Iowa Code chapter 422, division II.

In a situation where an individual is residing in a school district with a surtax and the individual dies during the tax year, the individual will be considered to be subject to the surtax, since the individual was residing in the school district on the last day of the individual's tax year.

An individual serving in the Armed Forces of the United States who maintains permanent residence in an Iowa school district with a surtax is subject to the surtax regardless of whether the individual is physically residing in the school district on the last day of the tax year.

A person who is present in the school district on the last day of the tax year on a temporary basis due to annual leave or in transit between duty stations is not subject to the surtax.

This rule is intended to implement Iowa Code sections 257.21, 257.29, and 422.15.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.2(422D) Emergency medical services income surtax. Effective July 1, 1992, a county board of supervisors may offer for voter approval a local option income surtax, an ad valorem property tax, or a combination of the two taxes to generate revenues for emergency medical services. However, this rule pertains only to the local option income surtax for emergency medical services. If a majority of those voting in the election approve the emergency medical services income surtax, the income surtax will be imposed for tax years beginning on or after January 1 of the fiscal year in which the election is held. Thus, if an election is held in the 2007-2008 fiscal year (July 1, 2007, through June 30, 2008) and the income surtax is approved in the election, the income surtax will be imposed on 2008 returns for individuals filing on a calendar-year basis. In the case of individuals filing on a fiscal-year basis, the income surtax will be imposed on returns for tax years beginning in the 2008 fiscal year. If an emergency medical services income surtax is imposed for a county, it can be imposed only for a maximum period of five years. When the emergency medical income surtax is repealed because the five-year imposition has expired, the income surtax is repealed as of December 31 for tax years beginning on or after that date.

42.2(1) *The rate of the income surtax imposed for emergency medical services.* After the income surtax is approved by an election of county voters, the board of supervisors will set the rate of tax to be imposed, which can be expressed in tenths of 1 percent or hundredths of 1 percent but cannot exceed 1 percent. In addition, because the cumulative total of the percents of income surtax imposed on any taxpayer in the county cannot exceed 20 percent, the rate of an emergency medical services income surtax may be limited, if a school district income surtax has been approved previously by a school district in the county and the surtax rate exceeds 19 percent. Therefore, assuming that a school district in the county had previously approved an income surtax rate of 19.4 percent, the medical emergency income surtax rate would be limited to six-tenths of 1 percent. If a school district income surtax and emergency medical income surtax are approved on or about the same date and the cumulative total of the income surtaxes is greater than 20 percent, the income surtax approved on the earlier of the two dates will be allowed at the rate approved and the second income surtax approved will be limited accordingly so that the cumulative rate will not exceed 20 percent. If a school district income surtax and an emergency medical income surtax are approved on the same date with a proposed cumulative rate that exceeds 20 percent, each of the surtaxes will be reduced equally so that the cumulative surtax rate will not exceed 20 percent. Assuming that a school district in a particular county approves an income surtax of 20 percent

on November 4, 2008, and an emergency medical income surtax of 1 percent is approved on the same date, both surtaxes will be reduced by five-tenths of 1 percent so that the cumulative rate of the two income surtaxes does not exceed 20 percent. The department of management can provide information about any income surtaxes that have been approved for the school districts in the county.

42.2(2) *Imposing the emergency medical income surtax.* The emergency medical income surtax will be imposed on the state income tax liability on each individual residing in the county at the end of the individual's tax year, whether the individual's tax year ends at the end of the calendar year or fiscal year. For purposes of the emergency medical income surtax, an individual's income tax liability is the aggregate of the state income taxes determined in Iowa Code section 422.5 less the nonrefundable credits against computed income tax which are authorized in Iowa Code chapter 422, division II.

42.2(3) *Administering the emergency medical income surtax.* The director of revenue shall administer the emergency medical income surtax in the same way as other state individual tax laws are administered. All powers and requirements related to administering the state income tax law apply to the administration of the emergency medical income surtax including, but not limited to, the provisions of Iowa Code sections 422.4, 422.20 to 422.31, 422.68, 422.70, and 422.72 to 422.75. The county board of supervisors and county officials shall confer with the director for assistance in drafting the ordinance imposing the emergency medical income surtax. Certified copies of the ordinance shall be filed with the department of revenue and the department of management within 30 days after the emergency medical income surtax is approved.

42.2(4) *Accounting for the emergency medical income surtax and paying the surtax.* The department shall account for the emergency medical income surtax and any interest and penalties on the surtax so that there is a separate accounting for each county where the income surtax is imposed. The accounting shall be applicable to those individual income tax returns filed on or before November 1 of the calendar year following the tax year for which the tax is imposed. The emergency medical income surtax and any penalties and interest should be credited to a "local income surtax fund" established in the office of the state treasurer. On or before December 15 of the year after the tax year, the director of revenue shall certify to the state treasurer the income surtax and any interest and penalties collected from returns filed on or before November 1.

This rule is intended to implement Iowa Code chapter 422D.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.3(422) Exemption credits.

42.3(1) A single person shall deduct from the computed tax a personal exemption credit of \$40. A single person is defined in 701—subrule 39.4(1).

42.3(2) A married person living with husband or wife at the close of the taxable year, or living with husband or wife at the time of the death of that spouse during the taxable year, shall, if a joint return is filed, deduct from the computed tax a personal exemption of \$80. Where such spouse files a separate return, each spouse is entitled to deduct from the computed tax a personal exemption of \$40. The personal exemption may not be divided between the spouses in any other proportion.

42.3(3) A taxpayer shall deduct from computed tax an exemption of \$40 for each dependent. "Dependent" has the same meaning as provided by the Internal Revenue Code, and the same dependents shall be claimed for Iowa income tax purposes as the taxpayer is entitled to claim for federal income tax purposes. If each spouse furnished 50 percent of the support, the spouses must elect between them which spouse is to be entitled to claim the dependent. The dividing of dependent credits applies only to the number of dependents and not to the credit amount for a particular dependent.

42.3(4) A head of household as defined in 701—subrule 39.4(7) is allowed a personal exemption credit of \$80.

42.3(5) A taxpayer who is 65 years of age on or before the first day following the end of the tax year is allowed an additional personal exemption credit of \$20 in addition to any other credits allowed by this rule.

42.3(6) A taxpayer who is blind, as defined in Iowa Code section 422.12(1) "e," is allowed a personal exemption credit of \$20 in addition to any other credits allowed by this rule.

42.3(7) A nonresident taxpayer or a part-year resident taxpayer will be allowed to deduct personal exemption credits as if the nonresident taxpayer or part-year taxpayer was a resident for the entire year.

This rule is intended to implement Iowa Code section 422.12.

[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.4(422) Tuition and textbook credit for expenses incurred for dependents attending grades kindergarten through 12 in Iowa. Effective for tax years beginning on or after January 1, 1998, taxpayers who pay tuition and textbook expenses of dependents who attend grades kindergarten through 12 in an Iowa school may receive a tax credit of 25 percent of up to \$1,000 of qualifying expenses for each dependent attending an elementary or secondary school located in Iowa. In order for the taxpayer to qualify for the tax credit for tuition and textbooks, the elementary school or secondary school that the dependent is attending must meet the standards for accreditation of public and nonpublic schools in Iowa provided in Iowa Code section 256.11. In addition, the school the dependent is attending must not be operated for profit and must adhere to the provisions of the United States Civil Rights Act of 1964, and the provisions of Iowa Code chapter 216, which is known as the Iowa civil rights Act of 1965. The following definitions and criteria apply to the determination of the tax credit for amounts paid by the taxpayer for tuition and textbooks for a dependent attending an elementary or secondary school in Iowa:

42.4(1) Tuition. For purposes of the tuition and textbook tax credit, “tuition” means any charge made by an elementary or secondary school for the expense of personnel, buildings, equipment and materials other than textbooks, and other expenses of elementary or secondary schools which relate to the teaching of only those subjects that are legally and commonly taught in public elementary or secondary schools in Iowa. “Tuition” includes charges by a qualified school for summer school classes or for private instruction of a child who is physically unable to attend classes at the site of the elementary or secondary school.

“Tuition” does not include charges or fees which relate to the teaching of religious tenets, doctrines, or worship in cases where the purpose of the teaching is to inculcate the religious tenets, doctrines, or worship. In addition, “tuition” does not include amounts paid to an individual or other entity for private instruction of a dependent who attends an elementary or secondary school in Iowa. Amounts paid to a school for meals, lodging, or clothing for a dependent do not qualify for the tax credit for tuition.

Amounts paid to an individual or organization for home schooling of a dependent or the teaching of a dependent outside of an elementary or secondary school may not be claimed for purposes of the tuition and textbook tax credit.

42.4(2) Textbooks. For purposes of the tuition and textbook tax credit, “textbooks” means books and other instructional materials used in elementary and secondary schools in Iowa to teach only those subjects legally and commonly taught in public elementary and secondary schools in Iowa. “Textbooks” includes fees or charges by the elementary or secondary school for required supplies or materials for classes in art, home economics, shop or similar courses. “Textbooks” also includes books and materials used for extracurricular activities, such as sporting events, musical events, dramatic events, speech activities, driver’s education, or programs of a similar nature.

“Textbooks” does not include amounts paid for books or other instructional materials used in the teaching of religious tenets, doctrines, or worship, in cases where the purpose of the teaching is to inculcate the religious tenets, doctrine, or worship. “Textbooks” also does not include amounts paid for books or other instructional materials used in teaching a dependent subjects in the home or outside of an elementary or secondary school.

42.4(3) Extracurricular activities. For purposes of the tuition and textbook tax credit, amounts paid for dependents to participate in or to attend extracurricular activities may be claimed as part of the tuition and textbook tax credit. “Extracurricular activities” includes sporting events, musical events, dramatic events, speech activities, driver’s education if provided at a school, and programs of a similar nature.

a. The following are specific examples of expenditures related to a dependent’s participation in or attendance at extracurricular activities that may qualify for the tuition and textbook tax credit:

- (1) Fees for participation in school sports activities.
- (2) Fees for field trips.

(3) Rental fees for instruments for school bands or orchestras but not rental fees in rent-to-own contracts.

(4) Driver's education fees, if paid to a school.

(5) Cost of activity tickets or admission tickets to school sporting, music and dramatic events.

(6) Fees for events such as homecoming, winter formal, prom, or similar events.

(7) Rental of costumes for school plays.

(8) Purchase of costumes for school plays if the costumes are not suitable for street wear.

(9) Purchase of track shoes, football shoes, or other athletic shoes with cleats, spikes, or other features that are not suitable for street wear.

(10) Costs of tickets or other admission fees to attend banquets or buffets for school academic or athletic awards.

(11) Trumpet grease, woodwind reeds, guitar picks, violin strings and similar types of items for maintenance of instruments used in school bands or orchestras.

(12) Band booster club or athletic booster club dues, but only if dues are for the dependent attending the school and not the parent or adult.

(13) Rental of formal gown or tuxedo for school dance or other school event.

(14) Dues paid to school clubs or school-sponsored organizations such as chess club, photography club, debate club, or similar organizations.

(15) Amounts paid for music that will be used in school music programs, including vocal music programs.

(16) Fees paid for general materials for shop class, agriculture class, home economics class, or auto repair class and general fees for equivalent classes.

(17) Fees for a dependent's bus trips to attend school if paid to the school.

b. The following are specific examples of expenditures related to a dependent's participation in or attendance at extracurricular activities that will not qualify for the tuition and textbook credit.

(1) Purchase of a musical instrument used in a school band or orchestra.

(2) Purchase of basketball shoes or other athletic shoes that are readily adaptable to street wear.

(3) Amounts paid for special testing such as SAT or PSAT, and for Iowa talent search tests.

(4) Payments for senior trips, band trips, and other overnight school activity trips which involve payment for meals and lodging.

(5) Fees paid to K-12 schools for courses for college credit.

(6) Amounts paid for T-shirts, sweatshirts and similar clothing that is appropriate for street wear.

(7) Amounts paid for special programs at universities and colleges for high school students.

(8) Payment for private instrumental lessons, voice lessons or similar lessons.

(9) Amounts paid for a school yearbook, annual or class ring.

(10) Fees for special materials paid for shop class, agriculture class, auto repair class, home economics class and similar classes. For purposes of this paragraph, "special materials" means materials used for personal projects of the dependents, such as materials to make furniture for personal use, automobile parts for family automobiles and other materials for projects for personal or family benefit.

42.4(4) Claiming the credit. The credit can only be claimed by the spouse who claims the dependent credit on the Iowa tax return as described in subrule 42.3(3). For example, for divorced or separated parents, only the spouse who claims the dependent credit on the Iowa return can claim the tuition and textbook credit for tuition and textbook expenses for that dependent.

In cases where married taxpayers file separately on a combined return form, the tuition and textbook credit shall be allocated between the spouses in the ratio in which the dependent credit was claimed between the spouses.

EXAMPLE: A married couple has two dependent children and claimed a tuition and textbook credit of \$500 related to both children on their 2011 Iowa return. The taxpayers filed separately on a combined Iowa return form for 2011. One spouse claimed both of the dependent credits on the Iowa return. The \$500 tuition and textbook credit will be claimed by the spouse who claimed the dependent credits on the Iowa return.

EXAMPLE: A married couple has three dependent children and claimed a tuition and textbook credit of \$600 related to all three children on their 2011 Iowa return. The taxpayers filed separately on a combined Iowa return form for 2011. One spouse claimed one dependent credit, and the other spouse claimed two dependent credits on the Iowa return. The spouse who claimed one dependent credit will claim \$200 of the tuition and textbook credit, while the spouse who claimed two dependent credits will claim \$400 of the tuition and textbook credit.

This rule is intended to implement Iowa Code section 422.12.
[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9820B, IAB 11/2/11, effective 12/7/11]

701—42.5(422) Nonresident and part-year resident credit. For tax years beginning on or after January 1, 1982, an individual who is a nonresident of Iowa for the entire tax year, or an individual who is an Iowa resident for a portion of the tax year, is allowed a credit against the individual's Iowa income tax liability for the Iowa income tax on the portion of the individual's income which was earned outside Iowa while the person was a nonresident of Iowa. This credit is computed on Schedule IA 126, which is included in the Iowa individual income tax booklet. The following subrules clarify how the nonresident and part-year resident credit is computed for nonresidents of Iowa and taxpayers who are part-year residents of Iowa during the tax year.

42.5(1) Nonresident/part-year resident credit for nonresidents of Iowa. A nonresident of Iowa shall complete the Iowa individual return in the same way an Iowa resident completes the form by reporting the individual's total net income, including income earned outside Iowa, on the front of the IA 1040 return form. A nonresident individual is allowed the same deduction for federal income tax and the same itemized deductions as an Iowa resident taxpayer with identical deductions for these expenditures. Thus, a nonresident with a taxable income of \$40,000 would have the same initial Iowa income tax liability as a resident taxpayer with a taxable income of \$40,000 before the nonresident/part-year resident credit is computed.

The nonresident/part-year resident credit is computed on Schedule IA 126. The lines referred to in this subrule are from Schedule IA 126 and Form IA 1040 for the 2008 tax year. Similar lines on the schedule and form may apply for subsequent tax years. The individual's Iowa source net income from lines 1 through 25 of the schedule is totaled on line 26 of the schedule. If the nonresident's Iowa source net income is less than \$1,000, the taxpayer is not subject to Iowa income tax and is not required to file an Iowa income tax return for the tax year. However, if the Iowa source net income amount is \$1,000 or more, the Iowa source net income is then divided by the person's all source net income on line 27 of Schedule IA 126 to determine the percentage of the Iowa net income to all source net income. This Iowa income percentage, which is rounded to the nearest tenth of a percent, is inserted on line 28 of the schedule, and this percentage is then subtracted from 100 percent to arrive at the nonresident/part-year resident credit percentage or the percentage of the individual's total income which was earned outside Iowa. The nonresident/part-year resident credit percentage is entered on line 29 of Schedule IA 126. The Iowa income tax on total income from line 43 of the IA 1040 is entered on line 30 of Schedule IA 126. The total of nonrefundable credits from line 49 of the IA 1040 is then shown on line 31 of Schedule IA 126. The amount on line 31 is subtracted from the amount on line 30, which results in the Iowa total tax after nonrefundable credits, which is entered on line 32. This Iowa tax-after-credits amount is multiplied by the nonresident/part-year resident credit percentage from line 29 to compute the nonresident/part-year resident credit. The amount of the credit is inserted on line 33 of Schedule IA 126 and on line 51 of the IA 1040.

EXAMPLE A. A single resident of Nebraska had Iowa source net income of \$15,000 in 2008 from wages earned from employment in Iowa. The rest of this person's income was attributable to sources outside Iowa. This nonresident of Iowa had an all source net income of \$40,000 and a taxable income of \$30,000 due to a federal tax deduction of \$7,000 and itemized deductions of \$3,000. The Iowa income percentage is computed by dividing the Iowa source net income of \$15,000 by the taxpayer's all source net income of \$40,000, which results in a percentage of 37.5. This percentage is subtracted from 100 percent which leaves a nonresident/part-year resident credit percentage of 62.5.

The Iowa tax from line 43 of the IA 1040 is \$1,508. The total nonrefundable credit from line 49 is \$40, which leaves a tax amount of \$1,468 when the credit is subtracted from \$1,508. When \$1,468 is multiplied by the nonresident/part-year resident credit percentage of 62.5, a nonresident credit of \$918 is computed which is entered on line 33 of Schedule IA 126 as well as on line 51 of the IA 1040 for 2008.

EXAMPLE B. A California resident, who was married, had \$20,000 of Iowa source income in 2008 from an Iowa farm. This individual had an additional \$80,000 in income that was attributable to sources outside Iowa, but the individual's spouse had no income. The taxpayers had paid \$18,000 in federal income tax in 2008 and had itemized deductions of \$12,000 in 2008.

The taxpayers' taxable income on their joint Iowa return was \$70,000. The taxpayers had an Iowa income tax liability of \$4,583 after application of the personal exemption credits of \$80. The taxpayers had an Iowa source income of \$20,000 and an all source net income of \$100,000. Therefore, the Iowa income percentage was 20. Subtracting the Iowa income percentage of 20 percent from 100 percent leaves a nonresident/part-year resident credit percentage of 80.

When the Iowa income tax liability of \$4,583 is multiplied by 80 percent, this results in a nonresident/part-year resident credit of \$3,666. This credit amount is entered on line 33 of the Schedule IA 126 and on line 51 of Form IA 1040.

42.5(2) *Nonresident/part-year resident credit for part-year residents of Iowa.* An individual who is a resident of Iowa for part of the tax year shall complete the front of the IA 1040 income tax return form as a resident taxpayer by showing the taxpayer's total income, including income earned outside Iowa, on the front of the IA 1040 return form. A part-year resident of Iowa is allowed the same federal tax deduction and itemized deductions as a resident taxpayer who has paid the same amount of federal income tax and has paid for the same deductions that can be claimed on Schedule A in the tax year. Therefore, a part-year resident would have the same initial Iowa income tax liability as an Iowa resident with the same taxable income before computation of the nonresident/part-year resident credit.

The nonresident/part-year resident credit for a part-year resident is computed on Schedule IA 126. The lines referred to in this subrule are from the IA 1040 income tax return form and the Schedule IA 126 for 2008. Similar lines may apply for tax years after 2008. The individual's Iowa source income is totaled on line 26 of Schedule IA 126 and includes all the individual's income received while the taxpayer was a resident of Iowa and all the Iowa source income received during the period of the tax year when the individual was a resident of a state other than Iowa. Iowa source income includes, but is not limited to, wages earned in Iowa while a resident of another state as well as income from Iowa farms and other Iowa businesses that was earned during the portion of the year that the taxpayer was a nonresident of Iowa. In the case of interest from a part-year resident's account at an Iowa financial institution, only interest earned during the period of the individual's Iowa residence is Iowa source income unless the account is for an Iowa business. If the part-year resident's account at a financial institution is for an Iowa business, all interest earned in the year by the part-year resident from the account is taxable to Iowa.

Income earned outside Iowa by the part-year resident during the portion of the year the individual was an Iowa resident is taxable to Iowa and is part of the individual's Iowa source income. To compute the nonresident/part-year resident credit for a part-year resident, the taxpayer's Iowa source income on Schedule IA 126 is totaled. If the Iowa source income is less than \$1,000, the taxpayer is not subject to Iowa income tax and is not required to file an Iowa return. If the Iowa source income is \$1,000 or more, it is divided by the taxpayer's all source net income on line 27 of Schedule IA 126. The percentage computed by this procedure is the Iowa income percentage and is entered on line 28 of the Schedule IA 126. The Iowa income percentage, which is rounded to the nearest tenth of a percent, is then subtracted from 100 percent to arrive at the nonresident/part-year resident credit percentage, which is entered on line 29 of Schedule IA 126. The Iowa tax from line 43 of the IA 1040 is then shown on line 30 of Schedule IA 126. The total of the Iowa nonrefundable credits from line 49 of the IA 1040 is entered on line 31 of Schedule IA 126 and is subtracted from the Iowa tax amount on line 30. The tax-after-credits amount on line 32 is next multiplied by the nonresident/part-year resident credit percentage from line 28. The amount calculated from this procedure is the nonresident/part-year resident credit, which is shown on line 33 of Schedule IA 126 and on line 51 of Form IA 1040.

EXAMPLE A. A single individual was a resident of Nebraska for the first half of 2008 and moved to Iowa on July 1, 2008, to accept a job in Des Moines. This individual earned \$20,000 from wages, \$200 from interest, and \$4,000 from a ranch in Nebraska from January 1, 2008, through June 30, 2008. In the last half of 2008, this person had wages of \$30,000, interest income of \$300, and \$4,000 from the Nebraska ranch. This part-year resident had federal income tax paid in 2008 of \$11,000 and had itemized deductions of \$3,000.

The part-year resident's all source net income was \$58,500 and the Iowa source net income was \$34,300, which includes the Iowa wages, the Nebraska ranch income of \$4,000 earned during the individual's period of Iowa residence, as well as the interest income of \$300 earned during that time of the tax year. The Iowa taxable income for the part-year resident for 2008 was \$44,500, which included the federal income tax deduction of \$11,000 and itemized deductions of \$3,000. The individual's Iowa income percentage was 58.6 which was determined by dividing the Iowa source income of \$34,300 by the all source income of \$58,500. Subtracting the Iowa income percentage of 58.6 from 100 percent results in a nonresident/part-year resident credit percentage of 41.4. The Iowa tax on total income was \$2,529 which was reduced to \$2,489 after subtraction of the personal exemption credit of \$40.

When \$2,489 is multiplied by the nonresident/part-year resident percentage of 41.4, a nonresident/part-year resident credit of \$1,030 is computed for this part-year resident.

EXAMPLE B. A single individual moved from Minnesota to Iowa on July 1, 2008. This person had received \$5,000 in income from an Iowa farm in March of the tax year and another \$10,000 from this farm in September of 2008. This person had \$10,000 in wages from employment in Minnesota in the first half of the year and another \$15,000 in wages from employment in Iowa in the last half of 2008. This person had \$2,000 in interest from a Minnesota bank in the first half of the year and \$2,000 in interest from an Iowa bank in the last six months of 2008. This taxpayer had \$8,000 in federal income tax withheld from wages in 2008 and claimed the standard deduction on both the Iowa and federal income tax returns.

The part-year resident's all source income was \$44,000 and the Iowa source income was \$32,000 which consisted of \$15,000 in wages, \$2,000 in interest income, and \$15,000 in income from the Iowa farm. Since the farm was in Iowa, the farm income received in the first half of 2008 was taxable to Iowa as well as the farm income received while the individual was an Iowa resident. The individual's Iowa taxable income was \$34,250 which was computed after subtracting the federal income tax deduction of \$8,000 and a standard deduction of \$1,750. The taxpayer's Iowa income tax liability was \$1,757 after subtraction of a personal exemption credit of \$40.

The taxpayer's Iowa income percentage was 72.7 which was computed by dividing the Iowa source income of \$32,000 by the all source income of \$44,000. The nonresident/part-year resident credit percentage was 27.3 which was arrived at by subtracting the Iowa income percentage of 72.7 from 100 percent. The taxpayer's nonresident/part-year resident credit is \$480. This was determined by multiplying the Iowa income tax liability after personal exemption credit amount of \$1,757 by the nonresident/part-year resident percentage of 27.3.

This rule is intended to implement Iowa Code section 422.5.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.6(422) Out-of-state tax credits.

42.6(1) General rule. Iowa residents are allowed an out-of-state tax credit for taxes paid to another state or foreign country on income which is also reported on the taxpayer's Iowa return. The out-of-state tax credit is allowable only if the taxpayer files an Iowa resident income tax return.

If the Iowa resident is a partner, shareholder, member, or beneficiary of a partnership, S corporation, limited liability company, or trust which files a composite income tax return in another state on behalf of the partners, shareholders, members or beneficiaries, the out-of-state tax credit will be allowed for the Iowa resident. The Iowa resident must provide a schedule of the resident's share of the income tax paid to another state on a composite basis, and the out-of-state tax credit is limited based upon the calculation set forth in subrule 42.6(2).

However, if the partnership, S corporation, limited liability company or trust is directly subject to tax in another state and the tax is not directly imposed on the resident taxpayer, then the out-of-state tax credit is not allowed for the Iowa resident on the tax directly imposed on the partnership, S corporation, limited liability company, or trust. For example, if another state does not recognize the S corporation election for state purposes and a corporation income tax is imposed directly on the S corporation, then the out-of-state tax credit is not allowed for the Iowa resident shareholder on the corporation income tax paid to the other state.

42.6(2) *Limitation of out-of-state tax credit.* If an Iowa resident taxpayer pays income tax to another state or foreign country on any of the taxpayer's income, the taxpayer is entitled to a net tax credit; that is, the taxpayer may deduct from the taxpayer's Iowa net tax (not from gross income) the amount of income tax actually paid to the other state or country, provided the amount deducted as a credit does not exceed the amount of Iowa net income tax on the same income which was taxed by the other state or foreign country.

42.6(3) *Computation of tax credit.*

a. The limitation on the tax credit must be computed according to the following formula: Gross income taxed by another state or foreign country that is also taxed by Iowa shall be divided by the total gross income of the Iowa resident taxpayer. This quotient, multiplied by the net Iowa tax as determined on the total gross income of the taxpayer as if entirely earned in Iowa, shall be the maximum tax credit against the Iowa net tax. This quotient shall be computed as a percentage rounded to the nearest tenth of a percent. However, if the income tax paid to the other state or foreign country on the gross income taxed by the other state or foreign country is less than the maximum tax credit against the Iowa tax, the out-of-state credit allowed against the Iowa tax may not exceed the income tax paid to the other state or foreign country. The income tax paid to the other state or foreign country is the net state or foreign income tax actually paid for the tax year on the income taxed by the other state or foreign country and not the state or foreign income tax paid during the tax year, such as state income tax or foreign income tax withheld from the income taxed by the other state or foreign country.

b. Out-of-state tax credit examples. An individual who is an Iowa resident for the entire tax year can claim an out-of-state tax credit against the person's Iowa income tax liability for any income tax paid to another state or foreign country for the tax year on any gross income received by the individual for the year which was derived from sources outside of Iowa to the extent this gross income is also subject to Iowa income tax.

However, in the case of an individual who is a part-year resident of Iowa for the tax year, that individual can only claim an out-of-state tax credit against the person's Iowa income tax liability for income tax paid to another state or foreign country on gross income derived from sources outside of Iowa during the period of the tax year that the individual was an Iowa resident and only to the extent this gross income derived from sources outside of Iowa was also subject to Iowa income tax.

The taxpayer's out-of-state credit is computed on Schedule IA 130 which is to be filed with the taxpayer's Iowa individual income tax return. The taxpayer's income tax return or other document of the other state or foreign country supporting the income tax paid to the other state or foreign country shall be filed with the individual's Iowa income tax return to support the out-of-state tax credit claimed.

EXAMPLE 1. Gene Miller was an Iowa resident for the entire year 2008. Mr. Miller lived in Council Bluffs and worked the entire year for a company in Omaha, Nebraska. Mr. Miller had wages of \$30,000 and Nebraska income tax withheld of \$1,000. He also had income of \$10,000 from rental of an Iowa farm and another \$10,000 in interest income from a personal savings account in an Iowa bank. The amount of Mr. Miller's gross income that was taxed by Nebraska (the other state or foreign country) was \$30,000. His total gross income in 2008 was \$50,000. Thus, 60 percent of his income was earned in Nebraska. Mr. Miller's Iowa tax on line 54 of Form IA 1040 was \$917, which resulted in a potential out-of-state credit of 60 percent of the Iowa tax or \$550 because 60 percent of Mr. Miller's income was earned outside Iowa and was taxed by Nebraska. However, Mr. Miller's income tax liability on the Nebraska income tax return was only \$500. Thus, the out-of-state tax credit allowed was \$500, because that was less than the potential out-of-state tax credit of \$550.

EXAMPLE 2. Ben Smith was a part-year Iowa resident in 2008. He resided in Missouri for the first six months of the year until he moved to Keokuk, Iowa, on July 1. Mr. Smith was employed in Missouri for the entire year and had wages of \$30,000 and had Missouri income tax liability of \$1,000. Half of Mr. Smith's wages or \$15,000 of the wages was earned during the time Mr. Smith was an Iowa resident. Mr. Smith also had \$10,000 in farm rental income from farmland located in Iowa. The amount of gross income taxed by Missouri while Mr. Smith was an Iowa resident was \$15,000. Mr. Smith's gross income earned while an Iowa resident for the year was \$25,000. Thus, 60 percent of the gross income was earned in the other state while Mr. Smith was an Iowa resident. Mr. Smith's Iowa income tax on line 54 of the IA 1040 was \$1,292. This resulted in a potential out-of-state credit of \$775 because 60 percent of the gross income was earned in Missouri during the period Mr. Smith was an Iowa resident. However, since 50 percent of the income earned in Missouri was earned while Mr. Smith was a resident of Iowa and the Missouri income tax liability for the year was \$1,000, the out-of-state credit was \$500 or 50 percent of the Missouri income tax liability. The out-of-state credit allowed was \$500, because this was less than the Iowa income tax of \$775 that was applicable to the gross income earned in Missouri during the period Mr. Smith was an Iowa resident.

42.6(4) Proof of claim for tax credit. The credit may be deducted from Iowa net income tax if written proof of such payment to another state or foreign country is furnished to the department. The department will accept any one of the following as proof of such payment:

a. A photocopy, or other similar reproduction, of either:

- (1) The receipt issued by the other state or foreign country for payment of the tax, or
- (2) The canceled check (both sides) with which the tax was paid to the other state or foreign country together with a statement of the amount and kind (whether wages, salaries, property or business) of total income on which such tax was paid.

b. A copy of the income tax return filed with the other state or foreign country which has been certified by the tax authority of that state or foreign country and showing thereon that the income tax assessed has been paid to them.

This rule is intended to implement Iowa Code section 422.8.
[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.7(422) Out-of-state tax credit for minimum tax.

42.7(1) General rule. Iowa residents are allowed an out-of-state tax credit for minimum taxes or income taxes paid to another state or foreign country on preference items derived from sources outside of Iowa. Part-year residents who pay minimum tax to another state or foreign country on preference items derived from sources outside Iowa will be allowed an out-of-state tax credit only to the extent that the minimum tax paid to the other state or foreign country relates to preference items that occurred during the period the taxpayer was an Iowa resident. Taxpayers who were nonresidents of Iowa for the entire tax year are not eligible for an out-of-state tax credit on their Iowa returns for minimum taxes paid to another state or foreign country on preference items.

If the Iowa resident is a partner, shareholder, member, or beneficiary of a partnership, S corporation, limited liability company, or trust which files a composite income tax return and pays minimum tax in another state on behalf of the partners, shareholders, members or beneficiaries, the out-of-state tax credit will be allowed for the Iowa resident. The Iowa resident must provide a schedule of the resident's share of the minimum tax paid to another state on a composite basis, and the out-of-state tax credit is limited based upon the calculation set forth in subrule 42.7(2).

However, if the partnership, S corporation, limited liability company, or trust is directly subject to minimum tax in another state and the minimum tax is not directly imposed on the resident taxpayer, then the out-of-state tax credit is not allowed for the Iowa resident on the minimum tax directly imposed on the partnership, S corporation, limited liability company, or trust. For example, if another state does not recognize the S corporation election for state tax purposes and a corporation income tax is imposed directly on the S corporation which includes minimum tax, then the out-of-state tax credit is not allowed for the Iowa resident shareholder on the corporation income tax, including minimum tax, paid to the other state.

42.7(2) Limitation of out-of-state tax credit for minimum tax. The limitation on the out-of-state tax credit for minimum tax is that the credit shall not exceed the Iowa minimum tax that would have been computed on the same preference items which were taxed by the other state or foreign country. The limitation may be determined according to the following formula: The total of preference items earned outside of Iowa and taxed by another state or foreign country shall be divided by the total of preference items of the resident taxpayer. This quotient, multiplied by the state minimum tax on the total of preference items as if entirely earned in Iowa, shall be the maximum credit against the Iowa minimum tax. However, if the minimum tax imposed by the other state or foreign country is less than the minimum tax computed under the limitation formula, the out-of-state credit for minimum tax will not exceed the minimum tax imposed by the other state or foreign country.

No out-of-state credit will be allowed on the Iowa return for minimum tax paid to another state or foreign country to the extent that the minimum tax of the other state or foreign country is imposed on items of tax preference not subject to the Iowa minimum tax. In addition, no out-of-state credit will be allowed for minimum tax paid to another state or foreign country of capital gains or losses from distressed sales which are excluded from the Iowa minimum tax. Capital gains or losses from distressed sales are described in rule 701—40.27(422).

42.7(3) Proof of claim for out-of-state tax credit for minimum tax. The out-of-state credit for minimum tax may be claimed on the return of a taxpayer if proof of payment of minimum tax to the state or foreign country is included with the return. Documents needed for proof of payment are a photocopy of the minimum tax form of the state or country to which minimum tax was paid as well as instructions from the minimum tax form or other information which specifies how the minimum tax is imposed and what preference items are subject to the minimum tax of that state or foreign country.

In the case of audit by the department of a taxpayer claiming an out-of-state tax credit for minimum tax paid, the department may require additional proof of payment of the out-of-state tax credit. The department will accept any of the following documents as verification of payment of the minimum tax:

- a. A photocopy, or other similar reproduction, of either:
 - (1) The receipt issued by the other state or foreign country for payment of the tax, including the minimum tax, or
 - (2) The canceled check (both sides) which was used for payment of the minimum tax to the other state or foreign country.
- b. A copy of the return filed with the other state or foreign country which has been certified by the tax authority of that state or foreign country and which shows that the income tax, including the minimum tax, has been paid.

This rule is intended to implement Iowa Code section 422.8.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.8(422) Withholding and estimated tax credits. An employee from whose wages tax is withheld shall claim credit for the tax withheld on the employee's income tax return for the year during which the tax was withheld. Credit will be allowed only if a copy of the withholding statement is attached to the return. Taxpayers who have made estimated income tax payments shall claim credit for the estimated tax paid for the taxable year.

This rule is intended to implement Iowa Code section 422.16.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.9(422) Motor fuel credit. An individual, partnership, limited liability company, or S corporation may elect to receive an income tax credit in lieu of the motor fuel tax refund provided by Iowa Code chapter 452A. An individual, partnership, limited liability company, or S corporation which holds a motor fuel tax refund permit under Iowa Code section 452A.18 when it makes this election must cancel the permit within 30 days after the first day of the tax year. However, if the refund permit is not canceled within this period, the permit becomes invalid at the time the election to receive an income tax credit is made. The election will continue for subsequent tax years unless a new motor fuel tax refund permit is obtained.

The motor fuel income tax credit must be the amount of Iowa motor fuel tax paid on qualifying fuel purchases as determined by Iowa Code chapter 452A and Iowa Code section 422.110 less any state sales tax as determined by 701—subrule 231.2(2). The credit must be claimed on the tax return covering the tax year in which the motor fuel tax was paid. If the motor fuel credit results in an overpayment of income tax, the overpayment may be refunded or may be credited to income tax due in the subsequent tax year.

The motor fuel tax credits for fuel taxes paid by partnerships, limited liability companies, and S corporations are not claimed on returns filed for the partnerships, limited liability companies, and S corporations. Instead, the pro rata shares of the motor fuel tax credits are allocated to the partners, members, and shareholders in the same ratio as incomes are allocated to the partners, members, and shareholders. A schedule must be attached to the individual's returns showing the distribution of gallons and the amount of credit claimed by each partner, member, or shareholder.

The partnership, limited liability company, or S corporation must attach to its return a schedule showing the allocation to each partner, member, or shareholder of the motor fuel purchased by the partnership, limited liability company, or S corporation which qualifies for the credit.

This rule is intended to implement Iowa Code sections 422.110 and 422.111.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.10(422) Alternative minimum tax credit for minimum tax paid in a prior tax year. Minimum tax paid in prior tax years commencing with tax years beginning on or after January 1, 1987, by a taxpayer can be claimed as a tax credit against the taxpayer's regular income tax liability in a subsequent tax year. Therefore, 1988 is the first tax year that the minimum tax credit is available, and the credit is based on the minimum tax paid by the taxpayer for 1987. The minimum tax credit may only be used against regular income tax for a tax year to the extent that the regular tax is greater than the minimum tax for the tax year. If the minimum tax credit is not used against the regular tax for a tax year, the remaining credit is carried over to the following tax year to be applied against the regular income tax liability for that period. The minimum tax credit is computed on Form IA 8801.

42.10(1) Examples of computation of the minimum tax credit and carryover of the credit.

EXAMPLE 1. The taxpayers reported \$5,000 of minimum tax for 2007. For 2008, the taxpayers reported regular tax of \$8,000, and the minimum tax liability is \$6,000. The minimum tax credit is \$2,000 for 2008 because, although the taxpayers had an \$8,000 regular tax liability, the credit is allowed only to the extent that the regular tax exceeds the minimum tax. Since only \$2,000 of the carryover credit from 2007 was used, there is a \$3,000 minimum tax carryover credit to 2009.

EXAMPLE 2. The taxpayers reported \$2,500 of minimum tax for 2007. For 2008, the taxpayers reported regular tax of \$8,000, and the minimum tax liability is \$5,000. The minimum tax credit is \$2,500 for 2008 because, although the regular tax exceeded the minimum tax by \$3,000, the credit is allowed only to the extent of minimum tax paid for prior tax years. There is no minimum tax carryover credit to 2009.

42.10(2) Minimum tax credit for nonresidents and part-year residents. Nonresident and part-year resident taxpayers who paid Iowa minimum tax in tax years beginning on or after January 1, 1987, are eligible for the minimum tax credit to the extent that the minimum tax they paid was attributable to tax preferences and adjustments. Therefore, if a nonresident or part-year resident taxpayer had Iowa source tax preferences or adjustments, then all the minimum tax that was paid would qualify for the minimum tax credit.

The minimum tax credit for a tax year as computed above applies to the regular income tax liability less the nonresident part-year credit to the extent this regular tax amount exceeds the minimum tax for the tax year. To the extent the credit is not used, the credit can be carried over to the next tax year.

This rule is intended to implement Iowa Code section 422.11B.
[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 2829C, IAB 11/23/16, effective 1/1/17]

701—42.11(15,422) Research activities credit. Effective for tax years beginning on or after January 1, 1985, taxpayers are allowed a credit equal to 6½ percent of the state's apportioned share of qualified expenditures for increasing research activities. Effective for tax years beginning on or after January 1,

1991, the Iowa research activities credit will be computed on the basis of the qualifying expenditures for increasing research activities as allowable under Section 41 of the Internal Revenue Code in effect on January 1, 1999. The state's apportioned share of the qualifying expenditures for increasing research activities is a percent equal to the ratio of qualified research expenditures in Iowa to the total qualified research expenditures. The Iowa research activities credit is made permanent for tax years beginning on or after January 1, 1991, even though there may no longer be a research activities credit for federal income tax purposes.

42.11(1) Qualified expenditures in Iowa are:

- a. Wages for qualified research services performed in Iowa.
- b. Cost of supplies used in conducting qualified research in Iowa.
- c. Rental or lease cost of personal property used in Iowa in conducting qualified research. Where personal property is used both within and without Iowa in conducting qualified research, the rental or lease cost must be prorated between Iowa and non-Iowa use by the ratio of days used in Iowa to total days used both within and without Iowa.
- d. Sixty-five percent of contract expenses paid by a corporation to a qualified organization for basic research performed in Iowa.

42.11(2) Total qualified expenditures are:

- a. Wages paid for qualified research services performed everywhere.
- b. Cost of supplies used in conducting qualified research everywhere.
- c. Rental or lease cost of personal property used in conducting qualified research everywhere.
- d. Sixty-five percent of contract expenses paid by a corporation to a qualified organization for basic research performed everywhere.

"Qualifying expenditures for increasing research activities" is the smallest of the amount by which the qualified research expenses for the taxable year exceed the base period research expenses or 50 percent of the qualified research expenses for the taxable year.

A taxpayer may claim on the taxpayer's individual income tax return the pro rata share of the credit for qualifying research expenditures incurred in Iowa by a partnership, subchapter S corporation, or estate or trust. The portion of the credit claimed by the individual must be in the same ratio as the individual's pro rata share of the earnings of the partnership, subchapter S corporation, or estate or trust.

Any research credit in excess of the individual's tax liability, less the nonrefundable credits authorized in Iowa Code chapter 422, division II, may be refunded to the taxpayer or may be credited to the estimated tax of the taxpayer for the following year.

42.11(3) Research activities credit for tax years beginning in 2000. Effective for tax years beginning on or after January 1, 2000, the taxes imposed for individual income tax purposes will be reduced by a tax credit for increasing research activities in this state.

a. The credit equals the sum of the following:

(1) Six and one-half percent of the excess of qualified research expenses during the tax year over the base amount for the tax year based upon the state's apportioned share of the qualifying expenditures for increasing research activities.

(2) Six and one-half percent of the basic research payments determined under Section 41(e)(1)(A) of the Internal Revenue Code during the tax year based upon the state's apportioned share of the qualifying expenditures for increasing research activities. The state's apportioned share of the qualifying expenditures for increasing research activities is a percent equal to the ratio of qualified research expenditures in this state to total qualified research activities.

b. In lieu of the credit computed under paragraph 42.11(3)"a," a taxpayer may elect to compute the credit amount for qualified research expenses incurred in this state in a manner consistent with the alternative incremental credit described in Section 41(c)(4) of the Internal Revenue Code for tax years beginning on or after January 1, 2000, but beginning before January 1, 2010. The taxpayer may make this election regardless of the method used by the taxpayer on the taxpayer's federal income tax return. The election made under this paragraph is for the tax year, and the taxpayer may use another method or this same method for any subsequent tax year. For purposes of this alternative incremental research credit computation, the credit percentages applicable to qualified research expenses described in clauses

(i), (ii), and (iii) of Section 41(c)(4)(A) of the Internal Revenue Code are 1.65 percent, 2.20 percent, and 2.75 percent, respectively.

c. In lieu of the credit computed under paragraph 42.11(3)“a,” a taxpayer may elect to compute the credit amount for qualified research expenses incurred in this state in a manner consistent with the alternative simplified credit described in Section 41(c)(5) of the Internal Revenue Code for tax years beginning on or after January 1, 2010. The taxpayer may make this election regardless of the method used by the taxpayer on the taxpayer’s federal income tax return. The election made under this paragraph is for the tax year, and the taxpayer may use another method or this same method for any subsequent tax year.

For purposes of this alternative simplified research credit computation, the credit percentages applicable to qualified research expenses described in Section 41(c)(5)(A) and clause (ii) of Section 41(c)(5)(B) of the Internal Revenue Code are 4.55 percent and 1.95 percent, respectively.

d. For purposes of this subrule, the terms “base amount,” “basic research payment,” and “qualified research expense” mean the same as defined for the federal credit for increasing research activities under Section 41 of the Internal Revenue Code, except that, for purposes of the alternative incremental credit described in paragraph 42.11(3)“b” and the alternative simplified credit described in paragraph 42.11(3)“c,” such amounts are limited to research activities conducted within this state. For purposes of this subrule, “Internal Revenue Code” means the Internal Revenue Code in effect on January 1, 2014.

e. An individual may claim a research activities credit incurred by a partnership, S corporation, limited liability company, estate, or trust electing to have the income of the business entity taxed to the individual. The amount claimed by an individual from the business entity shall be based upon the pro rata share of the individual’s earnings from a partnership, S corporation, estate or trust. Any research credit in excess of the individual’s tax liability, less the nonrefundable credits authorized in Iowa Code chapter 422, division II, may be refunded to the individual or may be credited to the individual’s tax liability for the following tax year.

f. An eligible business approved under the new jobs and income program prior to July 1, 2005, is eligible for an additional research activities credit as described in 701—subrule 52.7(4). An eligible business approved under the enterprise zone program is eligible for an additional research activities credit as described in 701—subrules 52.7(5) and 52.7(6).

g. Tax years ending on or after July 1, 2005, but before July 1, 2009. For eligible businesses approved under the enterprise zone program and the high quality job creation program, research activities allowable for the Iowa research activities credit include expenses related to the development and deployment of innovative renewable energy generation components manufactured or assembled in Iowa. These expenses are not eligible for the federal credit for increasing research activities. These innovative renewable energy generation components do not include components with more than 200 megawatts in installed effective nameplate capacity. The research activities credit related to renewable energy generation components under the enterprise zone program and the high quality job creation program shall not exceed \$1 million in the aggregate.

These expenses are available only for the additional research activities credit set forth in subrule 42.11(3), paragraph “f,” for businesses in enterprise zones and the additional research activities credit set forth in subrule 42.29(1) for businesses approved under the high quality job creation program. These expenses are not available for the research activities credit set forth in subrule 42.11(3), paragraphs “a,” “b” and “c.”

h. Tax years ending on or after July 1, 2009. For eligible businesses approved under the enterprise zone program prior to July 1, 2014, research activities allowable for the Iowa research activities credit include expenses related to the development and deployment of innovative renewable energy generation components manufactured or assembled in Iowa; such expenses related to the development and deployment of innovative renewable energy generation components are not eligible for the federal credit for increasing research activities. The enterprise zone program was repealed on July 1, 2014. However, any research activities credit earned by businesses approved under the enterprise zone program prior to July 1, 2014, remains valid and can be claimed on tax returns filed after July 1, 2014.

(1) For purposes of this paragraph, innovative renewable energy generation components do not include components with more than 200 megawatts in installed effective nameplate capacity.

(2) The research activities credit related to renewable energy generation components under the enterprise zone program and the high quality jobs program described in subrule 42.42(1) shall not exceed \$2 million for the fiscal year ending June 30, 2010, and \$1 million for the fiscal year ending June 30, 2011.

(3) These expenses related to the development and deployment of innovative renewable energy generation components are applicable only to the additional research activities credit set forth in subrule 42.11(3), paragraph “f,” for businesses in enterprise zones and the additional research activities credit set forth in subrule 42.42(1) for businesses approved under the high quality jobs program, and are not applicable to the research activities credit set forth in subrule 42.11(3), paragraphs “a,” “b” and “c.”

42.11(4) Reporting of research activities credit claims. Beginning with research activities credit claims filed on or after July 1, 2009, the department shall issue an annual report to the general assembly of all research activities credit claims in excess of \$500,000. The report, which is due by February 15 of each year, will contain the name of each claimant and the amount of the research activities credit for all claims filed during the previous calendar year in excess of \$500,000.

This rule is intended to implement Iowa Code sections 15.335 and 422.10 as amended by 2014 Iowa Acts, House File 2435.

[**ARC 8702B**, IAB 4/21/10, effective 5/26/10; **ARC 9104B**, IAB 9/22/10, effective 10/27/10; **ARC 9820B**, IAB 11/2/11, effective 12/7/11; **ARC 0337C**, IAB 9/19/12, effective 10/24/12; **ARC 1101C**, IAB 10/16/13, effective 11/20/13; **ARC 1545C**, IAB 7/23/14, effective 8/27/14; **ARC 1744C**, IAB 11/26/14, effective 12/31/14]

701—42.12(422) New jobs credit. A tax credit is available to an individual who has entered into an agreement under Iowa Code chapter 260E and has increased employment by at least 10 percent.

42.12(1) Definitions.

a. The term “new jobs” means those jobs directly resulting from a project covered by an agreement authorized by Iowa Code chapter 260E (Iowa industrial new jobs training Act) but does not include jobs of recalled workers or replacement jobs or other jobs that formerly existed in the industry in this state.

b. The term “jobs directly related to new jobs” means those jobs which directly support the new jobs but do not include in-state employees transferred to a position which would be considered to be a job directly related to new jobs unless the transferred employee’s vacant position is filled by a new employee. The burden of proof that a job is directly related to new jobs is on the taxpayer.

EXAMPLE A. A taxpayer who has entered into a chapter 260E agreement to train new employees for a new product line, transfers an in-state employee to be foreman of the new product line but does not fill the transferred employee’s position. The new foreman’s position would not be considered a job directly related to new jobs even though it directly supports the new jobs because the transferred employee’s old position was not refilled.

EXAMPLE B. A taxpayer who has entered into a chapter 260E agreement to train new employees for a new product line transfers an in-state employee to be foreman of the new product line and fills the transferred employee’s position with a new employee. The new foreman’s position would be considered a job directly related to new jobs because it directly supports the new jobs and the transferred employee’s old position was filled by a new employee.

c. The term “taxable wages” means those wages upon which an employer is required to contribute to the state unemployment fund as defined in Iowa Code subsection 96.19(37) for the year in which the taxpayer elects to take the new jobs tax credit. For fiscal year taxpayers, “taxable wages” shall not be greater than the maximum wage upon which an employer is required to contribute to the state unemployment fund for the calendar year in which the taxpayer’s fiscal year begins.

d. The term “agreement” means an agreement entered into under Iowa Code chapter 260E after July 1, 1985, an amendment to that agreement, or an amendment to an agreement entered into before July 1, 1985, if the amendment sets forth the base employment level as of the date of the amendment. The term “agreement” also includes a preliminary agreement entered into under Iowa Code chapter 260E provided the preliminary agreement contains all the elements of a contract and includes the necessary elements and commitments relating to training programs and new jobs.

e. The term “base employment level” means the number of full-time jobs an industry employs at a plant site which is covered by an agreement under Iowa Code chapter 260E on the date of the agreement.

f. The term “project” means a training arrangement which is the subject of an agreement entered into under Iowa Code chapter 260E.

g. The term “industry” means a business engaged in interstate or intrastate commerce for the purpose of manufacturing, processing, or assembling products, conducting research and development, or providing services in interstate commerce, but excludes retail, health, and professional services. “Industry” does not include a business which closes or substantially reduces its operations in one area of the state and relocates substantially the same operation in another area of the state. “Industry” is a business engaged in the above-listed activities rather than the generic definition encompassing all businesses in the state engaged in the same activities. For example, in the meat-packing business, an industry is considered to be a single corporate entity or operating division, rather than the entire meat-packing business in the state.

h. The term “new employees” means the same as new jobs or jobs directly related to new jobs.

i. The term “full-time job” means any of the following:

- (1) An employment position requiring an average work week of 35 or more hours;
- (2) An employment position for which compensation is paid on a salaried full-time basis without regard to hours worked; or
- (3) An aggregation of any number of part-time or job-sharing employment positions which equal one full-time employment position. For purposes of this subrule, each part-time or job-sharing employment position shall be categorized with regard to the average number of hours worked each week as one-quarter, half, three-quarters, or full-time position, as set forth in the following table:

| Average Number of Weekly Hours | Category |
|--------------------------------|---------------|
| More than 0 but less than 15 | $\frac{1}{4}$ |
| 15 or more but less than 25 | $\frac{1}{2}$ |
| 25 or more but less than 35 | $\frac{3}{4}$ |
| 35 or more | 1 (full-time) |

42.12(2) How to compute the credit. The credit is 6 percent of the taxable wages paid to employees in new jobs or jobs directly related to new jobs for the taxable year in which the taxpayer elects to take the credit.

EXAMPLE 1. A taxpayer enters into an agreement to increase employment by 20 new employees which is greater than 10 percent of the taxpayer’s base employment level of 100 employees. In year one of the agreement, the taxpayer hires 20 new employees but elects not to take the credit in that year. In year two of the agreement, only 18 of the new employees hired in year one are still employed and the taxpayer elects to take the credit. The credit would be 6 percent of the taxable wages of the 18 remaining new employees. In year three of the agreement, the taxpayer hires two additional new employees under the agreement to replace the two employees that left in year two and elects to take the credit. The credit would be 6 percent of the taxable wages paid to the two replacement employees. In year four of the agreement, three of the employees for which a credit had been taken left employment and three additional employees were hired. No credit is available for these employees. A credit can only be taken one time for each new job or job directly related to a new job.

EXAMPLE 2. A taxpayer operating two plants in Iowa enters into a chapter 260E agreement to train new employees for a new product line at one of the taxpayer’s plants. The base employment level on the date of the agreement at plant A is 300 and at plant B is 100. Under the agreement, 20 new employees will be trained for plant B which is greater than a 10 percent increase of the base employment level for plant B. In the year in which the taxpayer elects to take the credit, the employment level at plant A is 290 and at plant B is 120. The credit would be 6 percent of the wages of 10 new employees at plant B as 10 new jobs were created by the industry in the state. A credit for the remaining 10 employees can be taken if the employment level at plant A increases back to 300 during the period of time that the credit can be taken.

42.12(3) *When the credit can be taken.* The taxpayer may elect to take the credit in any tax year which either begins or ends during the period beginning with the date of the agreement and ending with the date by which the project is to be completed under the agreement. However, the taxpayer may not take the credit until the base employment level has been exceeded by at least 10 percent.

EXAMPLE: A taxpayer enters into an agreement to increase employment from a base employment level of 200 employees to 225 employees. In year one of the agreement, the taxpayer hires 20 new employees which is a 10 percent increase over the base employment level but elects not to take the credit. In year two of the agreement, two of the new employees leave employment. The taxpayer elects to take the credit which would be 6 percent of the taxable wages of the 18 employees currently employed. In year three, the taxpayer hires 7 new employees and elects to take the credit. The credit would be 6 percent of the taxable wages of the 7 new employees.

A taxpayer may claim on the taxpayer's individual income tax return the pro rata share of the Iowa new jobs credit from a partnership, subchapter S corporation, estate or trust. The portion of the credit claimed by the individual shall be in the same ratio as the individual's pro rata share of the earnings of the partnership, subchapter S corporation, or estate or trust. All partners in a partnership, shareholders in a subchapter S corporation and beneficiaries in an estate or trust shall elect to take the Iowa new jobs credit the same year.

For tax years beginning prior to January 1, 2007, any Iowa new jobs credit in excess of the individual's tax liability less the credits authorized in Iowa Code sections 422.12 and 422.12B may be carried forward for ten years or until it is used, whichever is the earlier. For tax years beginning on or after January 1, 2007, any Iowa new jobs credit in excess of the individual's tax liability less the credits authorized in Iowa Code section 422.12 may be carried forward for ten years or until it is used, whichever is the earlier.

This rule is intended to implement Iowa Code section 422.11A.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.13(422) Earned income credit.

42.13(1) *Tax years beginning before January 1, 2007.* Effective for tax years beginning on or after January 1, 1990, an individual is allowed an Iowa earned income credit equal to a percentage of the earned income credit to which the taxpayer is entitled on the taxpayer's federal income tax return as authorized in Section 32 of the Internal Revenue Code. The Iowa earned income credit is nonrefundable; therefore, the credit may not exceed the remaining income tax liability of the taxpayer after the personal exemption credits and the other nonrefundable credits are deducted. The percentage of the earned income credit for tax years beginning in the 1990 calendar year is 5 percent. The percentage of the earned income credit for tax years beginning on or after January 1, 1991, is 6.5 percent.

For federal income tax purposes, the earned income credit is available for a low-income worker who maintains a household in the United States that is the principal place of abode of the worker and a child or children for more than one-half of the tax year or the worker must have provided a home for the entire tax year for a dependent parent. In addition, the worker must be (1) a married person who files a joint return and is entitled to a dependency exemption for a son or daughter, adopted child or stepchild; (2) a surviving spouse; or (3) an individual who qualifies as a head of household as described in Section 2(b) of the Internal Revenue Code. The federal earned income credit for a taxpayer is determined by computing the taxpayer's earned income on a worksheet provided in the federal income tax return instructions and determining the allowable credit from a table included in the instructions for the 1040 or 1040A. For purposes of the credit, a taxpayer's earned income includes wages, salaries, tips, or other compensation plus net income from self-employment.

In the case of married taxpayers who filed a joint federal return and who elected to file separate state returns or separately on the combined return form, the Iowa earned income credit is allocated between the spouses in the ratio that each spouse's earned income relates to the earned income of both spouses.

Nonresidents and part-year residents of Iowa are allowed the same earned income credits as resident taxpayers.

42.13(2) *Tax years beginning on or after January 1, 2007.* Effective for tax years beginning on or after January 1, 2007, but beginning before January 1, 2013, an individual is allowed an Iowa earned income credit equal to 7 percent of the earned income credit to which the taxpayer is entitled on the taxpayer's federal income tax return as authorized in Section 32 of the Internal Revenue Code. For tax years beginning on or after January 1, 2013, but beginning before January 1, 2014, an individual is allowed an Iowa earned income tax credit equal to 14 percent of the earned income credit to which the taxpayer is entitled on the taxpayer's federal income tax return as authorized in Section 32 of the Internal Revenue Code. For tax years beginning on or after January 1, 2014, an individual is allowed an Iowa earned income tax credit equal to 15 percent of the earned income credit to which the taxpayer is entitled on the taxpayer's federal income tax return as authorized in Section 32 of the Internal Revenue Code. The Iowa earned income credit is refundable; therefore, the credit may exceed the remaining income tax liability of the taxpayer after the personal exemption credits and other nonrefundable credits are deducted.

In the case of married taxpayers who filed a joint federal return and who elected to file separate state returns or separately on the combined return form, the Iowa earned income credit is allocated between the spouses in the ratio that each spouse's earned income relates to the earned income of both spouses.

Nonresidents or part-year residents of Iowa must determine the Iowa earned income tax credit in the ratio of their Iowa source net income to their total source net income. In addition, if nonresidents or part-year residents of Iowa are married and elect to file separate returns or separately on the combined return form, the Iowa earned income credit must be allocated between the spouses in the ratio of each spouse's Iowa source net income to the combined Iowa source net income.

EXAMPLE: A married couple lives in Omaha, Nebraska. One spouse worked in Iowa in 2007 and had wages and other income from Iowa sources of \$12,000. That spouse had a federal adjusted gross income from all sources of \$15,000. The other spouse had no Iowa source net income and had a federal adjusted gross income from all sources of \$10,000. The taxpayers had a federal earned income credit of \$2,800.

The federal earned income credit of \$2,800 multiplied by 7 percent equals \$196. The ratio of Iowa source net income of \$12,000 divided by total source net income of \$25,000 equals 48 percent. The Iowa earned income tax credit equals \$196 multiplied by 48 percent, or \$94.

This rule is intended to implement Iowa Code section 422.12B as amended by 2013 Iowa Acts, Senate File 295.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1102C, IAB 10/16/13, effective 11/20/13]

701—42.14(15) Investment tax credit—new jobs and income program and enterprise zone program.

42.14(1) *General rule.* An investment tax credit of up to 10 percent of the new investment which is directly related to new jobs created by the location or expansion of an eligible business is available for businesses approved by the economic development authority under the new jobs and income program and the enterprise zone program. The new jobs and income program was repealed on July 1, 2005, and has been replaced with the high quality job creation program. See rule 701—42.29(15) for information on the investment tax credit under the high quality job creation program. Any investment tax credit earned by businesses approved under the new jobs and income program prior to July 1, 2005, remains valid and can be claimed on tax returns filed after July 1, 2005. The credit is available for machinery and equipment or improvements to real property placed in service after May 1, 1994. The credit shall be taken in the year the qualifying asset is placed in service. The enterprise zone program was repealed on July 1, 2014. Any investment tax credit earned by businesses approved under the enterprise zone program prior to July 1, 2014, remains valid and can be claimed on tax returns filed after July 1, 2014. For business applications received by the economic development authority on or after July 1, 1999, purchases of real property made in conjunction with the location or expansion of an eligible business, the cost of land and any buildings and structures located on the land will be considered to be new investment which is directly related to new jobs for purposes of determining the amount of new investment upon which an investment tax credit may be taken. For projects approved on or after July 1, 2005, under the enterprise

zone program, the investment tax credit will be amortized over a five-year period, as described in subrule 42.29(2).

For eligible businesses approved by the Iowa department of economic development on or after March 17, 2004, certain lease payments made by eligible businesses to a third-party developer will be considered to be new investment for purposes of computing the investment tax credit. The eligible business shall enter into a lease agreement with the third-party developer for a minimum of ten years. The investment tax credit is based on the annual base rent paid to a third-party developer by the eligible business for a period not to exceed ten years. The total costs of the annual base rent payments for the ten-year period cannot exceed the cost of the land and the third-party developer's cost to build or renovate the building used by the eligible business. The annual base rent is defined as the total lease payment less taxes, insurance and operating and maintenance expenses.

Any credit in excess of the tax liability for the tax year may be carried forward seven years or until used, whichever is the earlier.

If the business is a partnership, S corporation, limited liability company, or an estate or trust electing to have the income taxed directly to an individual, an individual may claim the credit. The amount of the credit claimed by the individual must be based on the individual's pro rata share of the individual's earnings of the partnership, S corporation, limited liability company, or estate or trust.

42.14(2) Investment tax credit—value-added agricultural products or biotechnology-related processes. For tax years beginning on or after July 1, 2001, an eligible business whose project primarily involves the production of value-added agricultural products may elect to receive a refund for all or a portion of an unused investment tax credit. For tax years beginning on or after July 1, 2001, but before July 1, 2003, an eligible business includes a cooperative described in Section 521 of the Internal Revenue Code which is not required to file an Iowa corporation income tax return and whose project primarily involves the production of ethanol. For tax years beginning on or after July 1, 2003, an eligible business includes a cooperative described in Section 521 of the Internal Revenue Code which is not required to file an Iowa corporation income tax return. For tax years ending on or after July 1, 2005, an eligible business approved under the enterprise zone program whose project primarily involves biotechnology-related processes may elect to receive a refund for all or a portion of an unused investment tax credit.

Eligible businesses shall apply to the Iowa department of economic development for tax credit certificates between May 1 and May 15 of each fiscal year through the fiscal year ending June 30, 2009. The election to receive a refund of all or a portion of an unused investment tax credit is no longer available beginning with the fiscal year ending June 30, 2010. Only those businesses that have completed projects before the May 1 filing date may apply for a tax credit certificate. The Iowa department of economic development will not issue tax credit certificates for more than \$4 million during a fiscal year for this program and eligible businesses described in subrule 42.29(2). If applications are received for more than \$4 million, the applicants shall receive certificates for a prorated amount.

The economic development authority will issue tax credit certificates within a reasonable period of time. Tax credit certificates are valid for the tax year following project completion. The tax credit certificate must be included with the tax return for the tax year during which the tax credit is claimed. The tax credit certificate shall not be transferred, except for a cooperative described in Section 521 of the Internal Revenue Code which is required to file an Iowa corporation income tax return and whose project primarily involves the production of ethanol for tax years beginning on or after January 1, 2002, or for a cooperative described in Section 521 of the Internal Revenue Code which is required to file an Iowa corporation income tax return for tax years beginning on or after July 1, 2003.

For value-added agricultural projects, for a cooperative that is not required to file an Iowa income tax return because it is exempt from federal income tax, the cooperative must submit a list of its members and the share of each member's interest in the cooperative. The Iowa department of economic development will issue a tax credit certificate to each member on the list.

See 701—subrule 52.10(4) for examples illustrating how this subrule is applied.

For tax years beginning on or after January 1, 2002, but before July 1, 2003, a cooperative described in Section 521 of the Internal Revenue Code which is required to file an Iowa corporation income tax return and whose project primarily involves the production of ethanol may elect to transfer all or a portion of its tax credit to its members. For tax years beginning on or after July 1, 2003, a cooperative described in Section 521 of the Internal Revenue Code which is required to file an Iowa corporation income tax return may elect to transfer all or a portion of its tax credit to its members. The amount of tax credit transferred and claimed by a member shall be based upon the pro rata share of the member's earnings in the cooperative. The economic development authority will issue a tax credit certificate to each member of the cooperative to whom the credit was transferred provided that tax credit certificates which total no more than \$4 million are issued during a fiscal year. The tax credit certificate must be included with the tax return for the tax year during which the tax credit is claimed.

42.14(3) Repayment of credits. If an eligible business fails to maintain the requirements of the new jobs and income program or the enterprise zone program, the taxpayer may be required to repay all or a portion of the tax incentives taken on Iowa returns. Irrespective of the fact that the statute of limitations to assess the taxpayer for repayment of the tax credits may have expired, the department may proceed to collect the tax incentives forfeited by failure to maintain the requirements of the new jobs and income program or the enterprise zone program because this repayment is a recovery of an incentive, rather than an adjustment to the taxpayer's tax liability. Details on the calculation of the repayment can be found in 261—subrule 187.5(4) of the administrative rules of the economic development authority. If the business is a partnership, limited liability company, S corporation, estate or trust where the income of the taxpayer is taxed to the individual owner(s) of the business, the department may proceed to collect the tax incentives against the partners, members, shareholders or beneficiaries to whom the tax incentives were passed through. See Decision of the Administrative Law Judge in *Damien & Colette Trebilcock, et al.*, Docket No. 11DORF 042-044, June 11, 2012.

If the eligible business, within five years of purchase, sells, disposes of, razes, or otherwise renders unusable all or a part of the land, buildings, or other existing structures for which a tax credit was claimed under this rule, the income tax liability of the eligible business for the year in which all or part of the property is sold, disposed of, razed, or otherwise rendered unusable shall be increased by one of the following amounts:

- a. One hundred percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within one full year after being placed in service.
- b. Eighty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within two full years after being placed in service.
- c. Sixty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within three full years after being placed in service.
- d. Forty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within four full years after being placed in service.
- e. Twenty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within five full years after being placed in service.

This rule is intended to implement Iowa Code section 15.333 as amended by 2010 Iowa Acts, Senate File 2380.

[**ARC 8702B**, IAB 4/21/10, effective 5/26/10; **ARC 9104B**, IAB 9/22/10, effective 10/27/10; **ARC 1744C**, IAB 11/26/14, effective 12/31/14]

701—42.15(422) Child and dependent care credit. Effective for tax years beginning on or after January 1, 1990, there is a child and dependent care credit which is refundable to the extent the amount of the credit exceeds the taxpayer's income tax liability less other applicable income tax credits.

42.15(1) Computation of the Iowa child and dependent care credit. The Iowa child and dependent care credit is computed as a percentage of the child and dependent care credit which is allowed for federal income tax purposes under Section 21 of the Internal Revenue Code. For taxpayers whose federal child and dependent care credit is limited to their federal tax liability, the Iowa credit shall be computed based on the lesser amount for tax years beginning on or after January 1, 2012, but before January 1,

2015. For tax years beginning on or after January 1, 2015, the Iowa credit is computed without regard to whether or not the federal credit was limited to the taxpayer's federal tax liability. In addition, for tax years beginning on or after January 1, 2015, the Iowa credit will be allowed even if the taxpayer's adjusted gross income is below \$0. The credit is computed so that taxpayers with lower adjusted gross incomes (net incomes in tax years beginning on or after January 1, 1991) are allowed higher percentages of their federal child care credit than taxpayers with higher adjusted gross incomes (net incomes). The following is a schedule showing the percentages of federal child and dependent care credits allowed on the taxpayers' Iowa returns on the basis of the federal adjusted gross incomes (or net incomes) of the taxpayers for tax years beginning on or after January 1, 1993.

| *Federal Adjusted Gross Income (Net Income for Tax Years Beginning on or after January 1, 1993) | Percentage of Federal Child and Dependent Care Credit Allowed for 1993 through 2005 Iowa Returns | Percentage of Federal Credit Allowed for 2006 and Later Tax Years |
|---|---|---|
| Less than \$10,000 | 75% | 75% |
| \$10,000 or more but less than \$20,000 | 65% | 65% |
| \$20,000 or more but less than \$25,000 | 55% | 55% |
| \$25,000 or more but less than \$35,000 | 50% | 50% |
| \$35,000 or more but less than \$40,000 | 40% | 40% |
| \$40,000 or more but less than \$45,000 | No Credit | 30% |
| \$45,000 or more | No Credit | No Credit |

*Note that in the case of married taxpayers who have filed joint federal returns and elect to file separate returns or separately on the combined return form, the taxpayers must determine the child and dependent care credit by the schedule provided in this rule on the basis of the combined federal adjusted gross income of the taxpayers or their combined net income for tax years beginning on or after January 1, 1991. The credit determined from the schedule must be allocated between the married taxpayers in the proportion that each spouse's federal adjusted gross income relates to the combined federal adjusted gross income of the taxpayers or in the proportion that each spouse's net income relates to the combined net income of the taxpayers in the case of tax years beginning on or after January 1, 1991.

42.15(2) Examples of computation of the Iowa child and dependent care credit. The following are examples of computation of the child and dependent care credit and the allocation of the credit between spouses in situations where married taxpayers have filed joint federal returns and are filing separate Iowa returns or separately on the combined return form. For tax years beginning on or after January 1, 1991, the taxpayers' net incomes are used to compute the Iowa child and dependent care credit and allocate the credit between spouses in situations where the taxpayers file separate Iowa returns or separately on the combined return form.

EXAMPLE A. A married couple has filed a joint federal return on which they showed a federal adjusted gross income of \$40,000 or a combined net income of \$40,000 on their state return for the tax year beginning January 1, 2007. Both spouses were employed. They had a federal child and dependent care credit of \$600 which related to expenses incurred for care of their two small children. One of the spouses had a federal adjusted gross income of \$30,000 or a net income of \$30,000 and the second spouse had a federal adjusted gross income of \$10,000 or a net income of \$10,000.

The taxpayers' Iowa child and dependent care credit was \$180 since they were entitled to an Iowa child and dependent care credit of 30 percent of their federal credit of \$600. If the taxpayers elect to file separate Iowa returns, the \$180 credit would be allocated between the spouses on the basis of each spouse's net income to the combined net income of both spouses as shown below:

$$\begin{aligned}
 \$180 \times \frac{\$30,000}{\$40,000} &= \$135 && \text{child and dependent care credit for spouse} \\
 &&& \text{with \$30,000 net income for 2007} \\
 \\
 \$180 \times \frac{\$10,000}{\$40,000} &= \$45 && \text{child and dependent care credit for spouse} \\
 &&& \text{with \$10,000 net income for 2007}
 \end{aligned}$$

EXAMPLE B. A married couple filed a joint federal return for 2007 and filed their 2007 Iowa return using the married filing separately on the combined return form filing status. Both spouses were employed. They had a federal child and dependent care credit of \$800 which related to expenses incurred for care of their children. One spouse had a net income of \$25,000 and the other spouse had a net income of \$12,500.

The taxpayers' Iowa child and dependent care credit was \$320, since they were entitled to an Iowa credit of 40 percent of their federal credit of \$800. The \$320 credit is allocated between the spouses on the basis of each spouse's net income as it relates to the combined net income of both spouses as shown below:

$$\begin{aligned}
 \$320 \times \frac{\$25,000}{\$37,500} &= \$213 && \text{child and dependent care credit for spouse} \\
 &&& \text{with \$25,000 net income for 2007} \\
 \\
 \$320 \times \frac{\$12,500}{\$37,500} &= \$107 && \text{child and dependent care credit for spouse} \\
 &&& \text{with \$12,500 net income for 2007}
 \end{aligned}$$

42.15(3) *Computation of the Iowa child and dependent care credit for nonresidents and part-year residents.* Nonresidents and part-year residents who have incomes from Iowa sources in the tax year may claim child and dependent care credits on their Iowa returns. To compute the amount of child and dependent care credit that can be claimed on the Iowa return by a nonresident or part-year resident, the following formula shall be used:

| | | | | |
|--|---|--|---|---|
| Federal child and dependent care credit | × | Percentage of federal child and dependent credit allowed on Iowa return from table in subrule 42.15(1) | × | $\frac{\text{*Iowa net income}}{\text{Federal adjusted grossincome or all source netincome}}$ |
|--|---|--|---|---|

*Iowa net income for purposes of determining the child care credit that can be claimed on the Iowa return by a nonresident or part-year resident taxpayer is the total of the Iowa source incomes less the Iowa source adjustments to income on line 26 of the Form IA 126.

In cases where married taxpayers are nonresidents or part-year residents of Iowa and are filing separate Iowa returns or separately on the combined return form, the child and dependent care credit allowable on the Iowa return should be allocated between the spouses in the ratio of the Iowa net income of each spouse to the combined Iowa net income of the taxpayers.

42.15(4) *Example of computation of the Iowa child and dependent care credit for nonresidents and part-year residents.* The following is an example of the computation of the Iowa child and dependent care credit for nonresidents and part-year residents.

A married couple lives in Omaha, Nebraska. One of the spouses worked in Iowa and had wages and other income from Iowa sources or an Iowa net income of \$15,000. That spouse had an all source net income of \$18,000. The second spouse had an Iowa net income of \$10,000 and an all source net income of \$12,000. The taxpayers had a federal child and dependent care credit of \$800 which related to expenses incurred for the care of their two young children. The taxpayers' Iowa child and dependent care credit is calculated below for the 2007 tax year:

| Federal child and dependent care credit | Percentage of federal child and dependent credit allowed on Iowa return | Iowa net income <hr style="width: 100%; border: 0.5px solid black; margin: 0;"/> All source net income |
|--|--|--|
| \$800 | × 50% = \$400 | × $\frac{\$25,000}{\$30,000}$ = \$333 |

The \$333 credit is allocated between the spouses as shown below for the 2007 tax year:

| | | |
|-------|-------------------------------|---|
| \$333 | × $\frac{\$10,000}{\$25,000}$ | = \$133 for spouse with Iowa source net income of \$10,000 |
| \$333 | × $\frac{\$15,000}{\$25,000}$ | = \$200 for spouse with Iowa source net income of \$15,000 |

This rule is intended to implement Iowa Code section 422.12C as amended by 2014 Iowa Acts, Senate File 2337.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 0337C, IAB 9/19/12, effective 10/24/12; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.16(422) Franchise tax credit. For tax years beginning on or after January 1, 1997, a shareholder in a financial institution, as defined in Section 581 of the Internal Revenue Code, which has elected to have its income taxed directly to the shareholders may take a tax credit equal to the shareholder's pro rata share of the Iowa franchise tax paid by the financial institution.

For tax years beginning on or after July 1, 2004, a member of a financial institution organized as a limited liability company that is taxed as a partnership for federal income tax purposes which has elected to have its income taxed directly to its members may take a tax credit equal to the member's pro rata share of the Iowa franchise tax paid by the financial institution.

The credit must be computed by recomputing the amount of tax computed under Iowa Code section 422.5 by reducing the shareholder's or member's taxable income by the shareholder's or member's pro rata share of the items of income and expenses of the financial institution and subtracting the credits allowed in Iowa Code sections 422.12 and 422.12B for tax years beginning prior to January 1, 2007. The recomputed tax must be subtracted from the amount of tax computed under Iowa Code section 422.5 reduced by the credits allowed in Iowa Code sections 422.12 and 422.12B for tax years beginning prior to January 1, 2007. For tax years beginning on or after January 1, 2007, only the credits allowed in Iowa Code section 422.12 are reduced in computing the franchise tax credit.

The resulting amount, not to exceed the shareholder's or member's pro rata share of the franchise tax paid by the financial institution, is the amount of tax credit allowed the shareholder or member.

This rule is intended to implement Iowa Code section 422.11.

[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.17(15E) Eligible housing business tax credit. An individual who qualifies as an eligible housing business may receive a tax credit of up to 10 percent of the new investment which is directly related to the building or rehabilitating of homes in an enterprise zone. The enterprise zone program was repealed on July 1, 2014, and the eligible housing business tax credit has been replaced with the workforce housing tax incentives program. See rule 701—42.53(15) for information on the tax incentives provided under the workforce housing tax incentives program. Any investment tax credit earned by businesses approved under the enterprise zone program prior to July 1, 2014, remains valid and can be claimed on tax returns filed after July 1, 2014. The tax credit may be taken on the tax return for the tax year in which the home is ready for occupancy.

An eligible housing business is one which meets the criteria in 2014 Iowa Code section 15E.193B.

42.17(1) *Computation of credit.* New investment which is directly related to the building or rehabilitating of homes includes but is not limited to the following costs: land, surveying, architectural services, building permits, inspections, interest on a construction loan, building materials, roofing, plumbing materials, electrical materials, amounts paid to subcontractors for labor and materials provided, concrete, labor, landscaping, appliances normally provided with a new home, heating and cooling equipment, millwork, drywall and drywall materials, nails, bolts, screws, and floor coverings.

New investment does not include the machinery, equipment, or hand or power tools necessary to build or rehabilitate homes.

A taxpayer may claim on the taxpayer's individual income tax return the pro rata share of the Iowa eligible housing business tax credit from a partnership, S corporation, limited liability company, estate, or trust. The portion of the credit claimed by the individual shall be in the same ratio as the individual's pro rata share of the earnings of the partnership, S corporation, limited liability company, or estate or trust, except for projects beginning on or after July 1, 2005, which used low-income housing tax credits authorized under Section 42 of the Internal Revenue Code to assist in the financing of the housing development. For these projects, the partnership, limited liability company or S corporation may designate the amount of the tax credit to be allocated to each partner, member or shareholder.

For tax years beginning prior to January 1, 2007, any Iowa eligible housing business tax credit in excess of the individual's tax liability, less the credits authorized in Iowa Code sections 422.12 and 422.12B, may be carried forward for seven years or until it is used, whichever is the earlier. For tax years beginning on or after January 1, 2007, any Iowa eligible housing business tax credit in excess of the individual's tax liability less the credits authorized in Iowa Code section 422.12 may be carried forward for seven years or until it is used, whichever is the earlier.

If the eligible housing business fails to maintain the requirements of 2014 Iowa Code section 15E.193B, the taxpayer, in order to be an eligible housing business, may be required to repay all or a part of the tax incentives the taxpayer received. Irrespective of the fact that the statute of limitations to assess the taxpayer for repayment of the income tax credit may have expired, the department may proceed to collect the tax incentives forfeited by failure to maintain the requirements of 2014 Iowa Code section 15E.193B. This repayment is required because it is a recovery of an incentive, rather than an adjustment to the taxpayer's tax liability. Details on the calculation of the repayment can be found in 261—subrule 187.5(4) of the administrative rules of the economic development authority. If the business is a partnership, limited liability company, S corporation, estate or trust where the income of the taxpayer is taxed to the individual owner(s) of the business, the department may proceed to collect the tax incentives against the partners, members, shareholders or beneficiaries to whom the tax incentives were passed through. See Decision of the Administrative Law Judge in *Damien & Colette Trebilcock, et al.*, Docket No. 11DORF 042-044, June 11, 2012.

Prior to January 1, 2001, the tax credit cannot exceed 10 percent of \$120,000 for each home or individual unit in a multiple dwelling unit building. Effective January 1, 2001, the tax credit cannot exceed 10 percent of \$140,000 for each home or individual unit in a multiple dwelling unit building.

Effective for tax periods beginning on or after January 1, 2003, the taxpayer must receive a tax credit certificate from the economic development authority to claim the eligible housing business tax credit. The tax credit certificate shall include the taxpayer's name, the taxpayer's address, the taxpayer's tax identification number, the date the project was completed, the amount of the eligible housing business tax credit and the tax year for which the credit may be claimed. In addition, the tax credit certificate shall include a place for the name and tax identification number of a transferee and the amount of the tax credit being transferred, as provided in subrule 42.17(2). The tax credit certificate must be included with the income tax return for the tax period in which the home is ready for occupancy. The administrative rules for the eligible housing business tax credit for the economic development authority may be found under 261—Chapter 59.

42.17(2) *Transfer of the eligible housing business tax credit.* For tax periods beginning on or after January 1, 2003, the eligible housing business tax credit certificates may be transferred to any person or entity if low-income housing tax credits authorized under Section 42 of the Internal Revenue Code are

used to assist in the financing of the housing development. In addition, the eligible housing business tax credit certificates may be transferred to any person or entity for projects beginning on or after July 1, 2005, if the housing development is located in a brownfield site as defined in Iowa Code section 15.291, or if the housing development is located in a blighted area as defined in Iowa Code section 403.17. No more than \$3 million of tax credits for housing developments located in brownfield sites or blighted areas may be transferred in a calendar year, with no more than \$1.5 million being transferred for any one eligible housing business in a calendar year.

The excess of the \$3 million limitation of tax credits eligible for transfer in the 2013 and 2014 calendar years for housing developments located in brownfield sites or blighted areas cannot be claimed by a transferee prior to January 1, 2016. The eligible housing business must have notified the economic development authority in writing before July 1, 2014, of the business's intent to transfer any tax credits for housing developments located in brownfield sites or blighted areas. If a tax credit certificate is issued by the economic development authority for a housing development approved prior to July 1, 2014, that is located in a brownfield site or blighted area, the tax credit can still be claimed by the eligible business, but the tax credit cannot be transferred by the eligible business if the economic development authority was not notified prior to July 1, 2014.

EXAMPLE 1: A housing development located in a brownfield site was completed in December 2013 and was issued a tax credit certificate totaling \$250,000. The \$3 million calendar cap for transferred tax credits for brownfield sites and blighted areas has already been reached for the 2013 and 2014 tax years. The \$250,000 tax credit is going to be transferred to Bill Smith, and the economic development authority was notified of the transfer prior to July 1, 2014. Once a replacement tax credit certificate has been issued, Mr. Smith cannot file an amended Iowa individual income tax return for the 2013 tax year until January 1, 2016, to claim the \$250,000 tax credit.

EXAMPLE 2: A housing development located in a blighted area was completed in May 2014 and was issued a tax credit certificate totaling \$150,000. The \$3 million calendar cap for transferred tax credits for brownfield sites and blighted areas has already been reached for the 2014 tax year. The \$150,000 tax credit is going to be transferred to Greg Rogers, and the economic development authority was notified of the transfer prior to July 1, 2014. Once a replacement tax credit certificate has been issued, Mr. Rogers cannot file an amended Iowa individual income tax return for the 2014 tax year until January 1, 2016, to claim the \$150,000 tax credit.

Within 90 days of transfer of the tax credit certificate for transfers prior to July 1, 2006, the transferee must submit the transferred tax credit certificate to the economic development authority, along with a statement which contains the transferee's name, address and tax identification number and the amount of the tax credit being transferred. For transfers on or after July 1, 2006, the transferee must submit the transferred tax credit certificate to the department of revenue. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee for transfers prior to July 1, 2006, the economic development authority will issue a replacement tax credit certificate to the transferee. For transfers on or after July 1, 2006, the department of revenue will issue the replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company or S corporation, the transferee shall provide a list of the partners, members or shareholders and information on how the housing business tax credit should be divided among the partners, members or shareholders. The transferee shall also provide the tax identification numbers and addresses of the partners, members or shareholders. The replacement tax credit certificate must contain the same information that was on the original certificate and must have the same expiration date as the original tax credit certificate.

The transferee may use the amount of the tax credit for any tax period for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credits shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

This rule is intended to implement 2014 Iowa Code section 15E.193B.
[**ARC 8702B**, IAB 4/21/10, effective 5/26/10; **ARC 1744C**, IAB 11/26/14, effective 12/31/14]

701—42.18(422) Assistive device tax credit. Effective for tax years beginning on or after January 1, 2000, a taxpayer that is a small business that purchases, rents, or modifies an assistive device or makes workplace modifications for an individual with a disability who is employed or will be employed by the taxpayer may qualify for an assistive device tax credit, subject to the availability of the credit. The assistive device credit is equal to 50 percent of the first \$5,000 paid during the tax year by the small business for the purchase, rental, or modification of an assistive device or for making workplace modifications. Any credit in excess of the tax liability may be refunded or applied to the taxpayer's tax liability for the following tax year. If the taxpayer elects to take the assistive device tax credit, the taxpayer shall not deduct for Iowa income tax purposes any amount of the cost of an assistive device or workplace modification that is deductible for federal income tax purposes. A small business will not be eligible for the assistive device credit if the device is provided for an owner of the small business unless the owner is a bona fide employee of the small business.

42.18(1) Submitting applications for the credit. A small business that wishes to receive the assistive device tax credit must submit an application for the credit to the Iowa department of economic development and provide other information and documents requested by the Iowa department of economic development. If the taxpayer meets the criteria for qualification for the credit, the Iowa department of economic development will issue the taxpayer a certificate of entitlement for the credit. However, the aggregate amount of assistive device tax credits that may be granted by the Iowa department of economic development to all small businesses during a fiscal year cannot exceed \$500,000. The certificate of entitlement for the assistive device credit shall include the taxpayer's name, the taxpayer's address, the taxpayer's tax identification number, the estimated amount of the tax credit, the date on which the taxpayer's application was approved, the date when it is anticipated that the assistive device project will be completed and a space on the application where the taxpayer shall enter the date that the assistive device project was completed. The certificate of entitlement will not be considered to be valid for purposes of claiming the assistive device credit on the taxpayer's Iowa income tax return until the taxpayer has completed the assistive device project and has entered the completion date on the certificate of entitlement form. The tax year of the small business in which the assistive device project is completed is the tax year for which the assistive device credit may be claimed. For example, in a case where taxpayer A received a certificate of entitlement for an assistive device credit on September 15, 2007, and completed the assistive device workplace modification project on January 15, 2008, taxpayer A could claim the assistive device credit on taxpayer A's 2008 Iowa return, assuming that taxpayer A is filing returns on a calendar-year basis.

The department of revenue will not allow the assistive device credit on a taxpayer's return if the certificate of entitlement or a legible copy of the certificate is not included with the taxpayer's income tax return. If the taxpayer has been granted a certificate of entitlement and the taxpayer is a partnership, limited liability company, S corporation, estate, or trust, where the income of the taxpayer is taxed to the individual owner(s) of the business entity, the taxpayer must provide a copy of the certificate to each of the owners with a statement showing how the credit is to be allocated among the individual owners of the business entity. An individual owner shall include a copy of the certificate of entitlement and the statement of allocation of the assistive device credit with the individual's state income tax return.

42.18(2) Definitions. The following definitions are applicable to this rule:

"Assistive device" means any item, piece of equipment, or product system which is used to increase, maintain, or improve the functional capabilities of an individual with a disability in the workplace or on the job. "Assistive device" does not mean any medical device, surgical device, or organ implanted or transplanted into or attached directly to an individual. "Assistive device" does not include any device for which a certificate of title is issued by the state department of transportation, but does include any item, piece of equipment, or product system otherwise meeting the definition of "assistive device" that is incorporated, attached, or included as a modification in or to such a device issued a certificate of title.

"Business entity" means partnership, limited liability company, S corporation, estate, or trust, where the income of the business is taxed to each of the individual owners of the business, whether the individual owner is a partner, member, shareholder, or beneficiary.

“*Disability*” means the same as defined in Iowa Code section 15.102. Therefore, “disability” means, with respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities of the individual, a record of physical or mental impairment that substantially limits one or more of the major life activities of the individual, or being regarded as an individual with a physical or mental impairment that substantially limits one or more of the major life activities of the individual. “Disability” does not include any of the following:

1. Homosexuality or bisexuality.
2. Transvestism, transsexualism, pedophilia, exhibitionism, voyeurism, gender identity disorders, or other sexual behavior disorders.
3. Compulsive gambling, kleptomania, or pyromania.
4. Psychoactive substance abuse disorders resulting from current illegal use of drugs.
5. Alcoholism.

“*Employee*” means an individual who is employed by the small business and who meets the criteria in Treasury Regulation § 31.3401(c)-1(b), which is the definition of an employee for federal income tax withholding purposes. An individual who receives self-employment income from the small business shall not be considered an employee of the small business for purposes of this rule.

“*Small business*” means that the business either had gross receipts in the tax year before the current tax year of \$3 million or less or employed not more than 14 full-time employees during the tax year prior to the current tax year.

“*Workplace modifications*” means physical alterations to the office, factory, or other work environment where the disabled employee is working or will work.

42.18(3) Allocation of assistive tax credit to owners of a business entity. If the taxpayer that was entitled to an assistive device credit is a business entity, the business entity shall allocate the allowable credit to each of the individual owners of the entity on the basis of each owner’s pro rata share of the earnings of the entity to the total earnings of the entity. Therefore, if a partnership has an assistive device credit of \$2,500 for a tax year and one partner of the partnership receives 25 percent of the earnings of the partnership, that partner would receive an assistive device credit for the tax year of \$625 or 25 percent of the total assistive device credit of the partnership.

42.18(4) Repeal of credit. The assistive device credit is repealed on July 1, 2009.

This rule is intended to implement Iowa Code section 422.11E.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.19(404A,422) Historic preservation and cultural and entertainment district tax credit for projects with Part 2 applications approved and tax credits reserved prior to July 1, 2014. A historic preservation and cultural and entertainment district tax credit, subject to the availability of the credit, may be claimed against a taxpayer’s Iowa individual income tax liability for 25 percent of the qualified costs of rehabilitation of property to the extent the costs were incurred on or after July 1, 2000, for approved rehabilitation projects of eligible property in Iowa.

The general assembly has mandated that the department of cultural affairs and the department of revenue adopt rules to jointly administer Iowa Code chapter 404A. 2014 Iowa Acts, House File 2453, amended the historic preservation and cultural and entertainment district tax credit program effective July 1, 2014. The department of revenue’s provisions for projects with tax credits reserved prior to July 1, 2014, are found in this rule. The department of revenue’s provisions for projects with agreements entered into on or after July 1, 2014, are found in rule 701—42.54(404A,422). The department of cultural affairs’ rules related to this program may be found at 223—Chapter 48. Division I of 223—Chapter 48 applies to projects with reservations approved prior to July 1, 2014. Division II of 223—Chapter 48 applies to projects with agreements entered into on or after July 1, 2014.

Notwithstanding anything contained herein to the contrary, the department of cultural affairs shall not reserve tax credits under 2013 Iowa Code chapter 404A as amended by 2013 Iowa Acts, chapter 112, section 1, for applicants that do not have an approved Part 2 application and a tax credit reservation on or before June 30, 2014. Projects with approved Part 2 applications and provisional tax credit reservations on or before June 30, 2014, shall be governed by 2013 Iowa Code chapter 404A as amended by 2013

Iowa Acts, chapter 112, section 1; by 223—Chapter 48, Division I; and by rule 701—42.19(404A,422). Projects for which Part 2 applications were approved and agreements entered into after June 30, 2014, shall be governed by 2014 Iowa Acts, House File 2453; by 223—Chapter 48, Division II; and by rule 701—42.54(404A,422).

42.19(1) *Eligible properties for the historic preservation and cultural and entertainment district tax credit.* The following types of property are eligible for the historic preservation and cultural and entertainment district tax credit:

- a. Property verified as listed on the National Register of Historic Places or eligible for such listing.
- b. Property designated as of historic significance to a district listed in the National Register of Historic Places or eligible for such designation.
- c. Property or district designated a local landmark by a city or county ordinance.
- d. Any barn constructed prior to 1937.

42.19(2) *Application and review process for the historic preservation and cultural and entertainment district tax credit.*

a. Taxpayers who want to claim an income tax credit for completing a historic preservation and cultural and entertainment district project must submit an application for approval of the project. The application forms for the historic preservation and cultural and entertainment district tax credit may be requested from the State Tax Credit Program Manager, State Historic Preservation Office, Department of Cultural Affairs, 600 E. Locust, Des Moines, Iowa 50319-0290. The telephone number for this office is (515)281-4137. Applications for the credit will be accepted by the state historic preservation office on or after July 1, 2000, until such time as all the available credits allocated for each fiscal year are encumbered.

b. Applicants for the historic preservation and cultural and entertainment district tax credit must include all information and documentation requested on the application forms for the credit in order for the application to be processed.

42.19(3) *Computation of the amount of the historic preservation and cultural and entertainment district tax credit.* The amount of the historic preservation and cultural and entertainment district tax credit is 25 percent of the qualified rehabilitation costs made to an eligible property in a project. Qualified rehabilitation costs are those rehabilitation costs approved by the state historic preservation office for a project for a particular taxpayer to the extent those rehabilitation costs are actually expended by that taxpayer.

a. In the case of commercial property, qualified rehabilitation costs must equal at least \$50,000 or 50 percent of the assessed value of the property, excluding the value of the land, prior to rehabilitation, whichever is less. In the case of property other than commercial property, the qualified rehabilitation costs must equal at least \$25,000 or 25 percent of the assessed value, excluding the value of the land, prior to the rehabilitation, whichever amount is less.

b. In computing the tax credit, the only costs which may be included are the qualified rehabilitation costs incurred commencing from the date on which the first qualified rehabilitation cost is incurred and ending with the end of the taxable year in which the property is placed in service. The rehabilitation period may include dates that precede approval of a project, provided that any qualified rehabilitation costs incurred prior to the date of approval of the project are qualified rehabilitation costs.

c. For purposes of the historic preservation and cultural and entertainment district tax credit, qualified rehabilitation costs include those costs properly included in the basis of the eligible property for income tax purposes. Costs treated as expenses and deducted in the year paid or incurred and amounts that are otherwise not added to the basis of the property for income tax purposes are not qualified rehabilitation costs. Amounts incurred for architectural and engineering fees, site survey fees, legal expenses, insurance premiums, development fees, and other construction-related costs are qualified rehabilitation costs to the extent they are added to the basis of the eligible property for tax purposes. Costs of sidewalks, parking lots, and landscaping do not constitute qualified rehabilitation costs. Any rehabilitation costs used in the computation of the historic preservation and cultural and entertainment district tax credit are not added to the basis of the property for Iowa income tax purposes if the rehabilitation costs were incurred in a tax year beginning on or after January 1, 2000, but prior

to January 1, 2001. Any rehabilitation costs incurred in a tax year beginning on or after January 1, 2001, are added to the basis of the rehabilitated property for income tax purposes except those rehabilitation expenses that are equal to the amount of the computed historic preservation and cultural and entertainment district tax credit for the tax year.

EXAMPLE: The basis of a commercial building in a historic district was \$500,000, excluding the value of the land, before the rehabilitation project. During a project to rehabilitate this building, \$600,000 in rehabilitation costs were expended to complete the project and \$500,000 of those rehabilitation costs were qualified rehabilitation costs which were eligible for the historic preservation and cultural and entertainment district tax credit of \$125,000. Therefore, the basis of the building for Iowa income tax purposes was \$975,000, since the qualified rehabilitation costs of \$125,000, which are equal to the amount of the historic preservation and cultural and entertainment district tax credit for the tax year, are not added to the basis of the rehabilitated property. The basis of the building for federal income tax purposes was \$1,100,000. It should be noted that this example does not consider any possible reduced basis for the building for federal income tax purposes due to the rehabilitation investment credit provided in Section 47 of the Internal Revenue Code.

42.19(4) *Completion of the historic preservation and cultural and entertainment district project and claiming the historic preservation and cultural and entertainment district tax credit on the Iowa return.* After the taxpayer completes an authorized rehabilitation project, the taxpayer must be issued a certificate of completion of the project from the state historic preservation office of the department of cultural affairs. After verifying the taxpayer's eligibility for the historic preservation and cultural and entertainment district tax credit, the state historic preservation office shall issue a historic preservation and cultural and entertainment district tax credit certificate, which shall be included with the taxpayer's income tax return for the tax year in which the rehabilitation project is completed or the year the credit was reserved, whichever is later. For example, if a project was completed in 2008 and the credit was reserved for the state fiscal year ending June 30, 2010, the credit can be claimed on the 2009 calendar year return that is due on April 30, 2010. The tax credit certificate shall include the taxpayer's name, the taxpayer's address, the taxpayer's tax identification number, the address or location of the rehabilitation project, the date the project was completed, the year the tax credit was reserved and the amount of the historic preservation and cultural and entertainment district tax credit. In addition, the tax credit certificate shall include a place for the name and tax identification number of a transferee, the amount of the tax credit being transferred, and any consideration received in exchange for the tax credit, as provided in subrule 42.19(6). In addition, if the taxpayer is a partnership, limited liability company, estate or trust, where the tax credit is allocated to the owners or beneficiaries of the entity, a list of the owners or beneficiaries and the amount of credit allocated to each owner or beneficiary shall be provided with the certificate. The tax credit certificate shall be included with the income tax return for the period in which the project was completed.

For tax years ending on or after July 1, 2007, any historic preservation and cultural and entertainment district tax credit in excess of the taxpayer's tax liability is fully refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

42.19(5) *Allocation of historic preservation and cultural and entertainment district tax credits to the individual owners of the entity for tax credits reserved for fiscal years beginning on or after July 1, 2012.* For tax credits reserved for fiscal years beginning on or after July 1, 2012, the partnership, limited liability company or S corporation may designate the amount of the tax credit to be allocated to each partner, member or shareholder. The credit does not have to be allocated based on the pro rata share of earnings of the partnership, limited liability company or S corporation.

42.19(6) *Transfer of the historic preservation and cultural and entertainment district tax credit.* For tax periods beginning on or after January 1, 2003, the historic preservation and cultural and entertainment district tax credit certificates may be transferred to any person or entity. A tax credit certificate of less than \$1,000 shall not be transferable.

a. For transfers on or after July 1, 2006, the department of revenue will issue the replacement tax credit certificate to the transferee. Within 90 days of the transfer of the tax credit certificate, the

transferee must submit the transferred tax credit certificate to the department of revenue along with a statement containing the transferee's name, tax identification number and address, the denomination that each replacement tax credit certificate is to carry, the amount of all consideration provided in exchange for the tax credit and the names of recipients of any consideration provided in exchange for the tax credit. If a payment of money was any part of the consideration provided in exchange for the tax credit, the transferee shall list the amount of the payment of money in its statement to the department of revenue. If any part of the consideration provided in exchange for the tax credit included nonmonetary consideration, including but not limited to any promise, representation, performance, discharge of debt or nonmonetary rights or property, the tax credit transferee shall describe the nature of nonmonetary consideration and disclose any value the transferor and transferee assigned to the nonmonetary consideration. The tax credit transferee must indicate on its statement to the department of revenue if no consideration was provided in exchange for the tax credit. If the transferee is a partnership, limited liability company or S corporation, the transferee shall provide a list of the partners, members or shareholders and information on how the historic preservation and cultural and entertainment district tax credit should be divided among the partners, members or shareholders. The transferee shall also provide the tax identification numbers and addresses of the partners, members or shareholders. The replacement tax credit certificate must contain the same information that was on the original certificate and must have the same expiration date as the original tax credit certificate.

b. The transferee may use the amount of the tax credit for any tax period for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

c. If the historic preservation and cultural and entertainment district tax credit of the transferee exceeds the tax liability shown on the transferee's return, the tax credit shall be fully refundable.

This rule is intended to implement Iowa Code chapter 404A as amended by 2013 Iowa Acts, Senate File 436, and Iowa Code section 422.11D.

[**ARC 8702B**, IAB 4/21/10, effective 5/26/10; **ARC 9104B**, IAB 9/22/10, effective 10/27/10; **ARC 9876B**, IAB 11/30/11, effective 1/4/12; **ARC 0398C**, IAB 10/17/12, effective 11/21/12; **ARC 1138C**, IAB 10/30/13, effective 12/4/13; **ARC 1968C**, IAB 4/15/15, effective 5/20/15]

701—42.20(422) Ethanol blended gasoline tax credit. Effective for tax years beginning on or after January 1, 2002, a retail gasoline dealer may claim an ethanol blended gasoline tax credit against that individual's individual income tax liability. The taxpayer must operate at least one retail motor fuel site at which more than 60 percent of the total gallons of gasoline sold and dispensed through one or more motor fuel pumps by the taxpayer in the tax year is ethanol blended gasoline. The tax credit shall be calculated separately for each retail motor fuel site operated by the taxpayer. The amount of the credit for each eligible retail motor fuel site is two and one-half cents multiplied by the total number of gallons of ethanol blended gasoline sold and dispensed through all motor fuel pumps located at that retail motor fuel site during the tax year in excess of 60 percent of all gasoline sold and dispensed through motor fuel pumps at that retail motor fuel site during the tax year.

For taxpayers having a fiscal year ending in 2002, the tax credit is available for each eligible retail motor fuel site based on the total number of gallons of ethanol blended gasoline sold and dispensed through all motor fuel pumps located at the taxpayer's retail motor fuel site from January 1, 2002, until the end of the taxpayer's fiscal year. Assuming a tax period that began on July 1, 2001, and ended on June 30, 2002, the taxpayer would be eligible for the tax credit based on the gallons of ethanol blended gasoline sold from January 1, 2002, through June 30, 2002. For taxpayers having a fiscal year ending in 2002, a claim for refund to claim the ethanol blended gasoline tax credit must be filed before October 1, 2003, even though the statute of limitations for refund set forth in 701—subrule 43.3(8) has not yet expired.

EXAMPLE 1: A taxpayer sold 100,000 gallons of gasoline at the taxpayer's retail motor fuel site during the tax year, 70,000 gallons of which was ethanol blended gasoline. The taxpayer is eligible for the credit since more than 60 percent of the total gallons sold was ethanol blended gasoline. The number

of gallons in excess of 60 percent of all gasoline sold is 70,000 less 60,000, or 10,000 gallons. Two and one-half cents multiplied by 10,000 equals a \$250 credit available.

The credit may be calculated on Form IA 6478. The credit must be calculated separately for each retail motor fuel site operated by the taxpayer. Therefore, if the taxpayer operates more than one retail motor fuel site, it is possible that one retail motor fuel site may be eligible for the credit while another retail motor fuel site may not. The credit may be taken only for those retail motor fuel sites for which more than 60 percent of gasoline sales involves ethanol blended gasoline.

Any credit in excess of the taxpayer's tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

Starting with the 2006 calendar tax year, a taxpayer may claim the ethanol blended gasoline tax credit even if the taxpayer also claims the E-85 gasoline promotion tax credit provided in rule 701—42.31(422) for the same tax year for the same ethanol gallons.

EXAMPLE 2: A taxpayer sold 200,000 gallons of gasoline at a retail motor fuel site in 2006, of which 160,000 gallons was ethanol blended gasoline. Of these 160,000 gallons, 1,000 gallons was E-85 gasoline. Taxpayer is entitled to claim the ethanol blended gasoline tax credit of two and one-half cents multiplied by 40,000 gallons, since this amount constitutes the gallons in excess of 60 percent of the total gasoline gallons sold. Taxpayer may also claim the E-85 gasoline promotion tax credit on the 1,000 gallons of E-85 gasoline sold.

42.20(1) Definitions. The following definitions are applicable to this rule:

"Ethanol blended gasoline" means the same as defined in Iowa Code section 214A.1.

"Gasoline" means any liquid product prepared, advertised, offered for sale or sold for use as, or commonly and commercially used as, motor fuel for use in a spark-ignition, internal combustion engine, and which meets the specifications provided in Iowa Code section 214A.2.

"Motor fuel pump" means a pump, meter, or similar commercial weighing and measuring device used to measure and dispense motor fuel for sale on a retail basis.

"Retail dealer" means a person engaged in the business of storing and dispensing motor fuel from a motor fuel pump for sale on a retail basis, regardless of whether the motor fuel pump is located at a retail motor fuel site including a permanent or mobile location.

"Retail motor fuel site" means a geographic location in Iowa where a retail dealer sells and dispenses motor fuel on a retail basis. For example, tank wagons are considered retail motor fuel sites.

"Sell" means to sell on a retail basis.

42.20(2) Allocation of credit to owners of a business entity. If the taxpayer that was entitled to the ethanol blended gasoline tax credit is a partnership, limited liability company, S corporation, estate, or trust, the business entity shall allocate the allowable credit to each of the individual owners of the entity on the basis of each owner's pro rata share of the earnings of the entity to the total earnings of the entity. Therefore, if a partnership has an ethanol blended gasoline tax credit of \$3,000 and one partner of the partnership receives 25 percent of the earnings of the partnership, that partner would receive an ethanol blended gasoline tax credit for the tax year of \$750 or 25 percent of the total ethanol blended gasoline tax credit of the partnership.

42.20(3) Repeal of ethanol blended gasoline tax credit. The ethanol blended gasoline tax credit is repealed on January 1, 2009. However, the tax credit is available for taxpayers whose fiscal year ends after December 31, 2008, for those ethanol gallons sold beginning on the first day of the taxpayer's fiscal year until December 31, 2008. The ethanol promotion tax credit described in rule 701—42.37(15,422) is available beginning January 1, 2009, for retail dealers of gasoline.

See 701—subrule 52.19(3) for an example illustrating how this subrule is applied.

This rule is intended to implement Iowa Code section 422.11C.

[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.21(15E) Eligible development business investment tax credit. Effective for tax years beginning on or after January 1, 2001, a business which qualifies as an eligible development business may receive a tax credit of up to 10 percent of the new investment which is directly related to the

construction, expansion or rehabilitation of building space to be used for manufacturing, processing, cold storage, distribution, or office facilities.

An eligible development business must be approved by the Iowa department of economic development prior to March 17, 2004, and meet the qualifications of Iowa Code section 15E.193C. Effective March 17, 2004, the eligible development business program is repealed.

New investment includes the purchase price of land and the cost of improvements made to real property. The tax credit may be claimed by an eligible development business in the tax year in which the construction, expansion or rehabilitation is completed.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following seven years or until used, whichever is the earlier.

If the business is a partnership, S corporation, limited liability company, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, S corporation, limited liability company, or estate or trust.

If the eligible development business fails to meet and maintain any one of the requirements to be an eligible business, the business shall be subject to repayment of all or a portion of the amount of tax incentives received. For example, if within five years of project completion the development business sells or leases any space to any retail business, the development business shall proportionally repay the value of the investment credit. The proportion of the investment credit that would be due for repayment by an eligible development business for selling or leasing space to a retail business would be determined by dividing the square footage of building space occupied by the retail business by the square footage of the total building space.

An eligible business which is not a development business and which operates in an enterprise zone cannot claim an investment tax credit if the property is owned, or was previously owned, by an approved development business that has already received an investment tax credit. An eligible business which is not a development business can claim an investment tax credit only on additional new improvements made to real property that was not included in the development business's approved application for the investment tax credit.

This rule is intended to implement Iowa Code section 15E.193C.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.22(15E,422) Venture capital credits.

42.22(1) *Investment tax credit for an equity investment in a qualifying business or community-based seed capital fund.*

a. Equity investments in a qualifying business or community-based seed capital fund before January 1, 2011. See rule 123—2.1(15E) for the discussion of the investment tax credit for an equity investment in a qualifying business or community-based seed capital fund, along with the issuance of tax credit certificates by the Iowa capital investment board, for equity investments made before January 1, 2011. For equity investments made in a qualifying business prior to January 1, 2004, only direct investments made by an individual are eligible for the investment tax credit. Individuals receiving income from a revocable trust's investment in a qualifying business are eligible for the investment tax credit for the portion of the revocable trust's equity investment in a qualifying business.

b. Equity investments in a qualifying business or community-based seed capital fund on or after January 1, 2011, and before July 2, 2015. For equity investments made on or after January 1, 2011, see 261—Chapter 115 for information regarding eligibility for qualifying businesses and community-based seed capital funds, applications for the investment tax credit for equity investments in a qualifying business or community-based seed capital fund, and the issuance of tax credit certificates by the economic development authority.

(1) Certificate issuance. The department of revenue will be notified by the economic development authority when the tax credit certificates are issued.

(2) Amount of the tax credit. The credit is equal to 20 percent of the taxpayer's equity investment in a qualifying business or community-based seed capital fund.

(3) Year in which the tax credit may be claimed. An investment shall be deemed to have been made on the same date as the date of acquisition of the equity interest as determined by the Internal Revenue Code. For investments made prior to January 1, 2014, a taxpayer shall not claim the tax credit prior to the third tax year following the tax year in which the investment is made. For investments made in qualifying businesses on or after January 1, 2014, the credit can be claimed in the year of the investment. However, for investments made in qualifying businesses during the 2014 calendar year, the credit cannot be redeemed prior to January 1, 2016. For example, if an individual taxpayer whose tax year ends on December 31, 2012, makes an equity investment during the 2012 calendar year, the individual taxpayer cannot claim the tax credit until the tax year ending December 31, 2015. However, if the taxpayer dies prior to redeeming the tax credit, the remaining tax credit may be redeemed on the decedent's final income tax return. For fiscal years beginning July 1, 2011, the amount of tax credits authorized cannot exceed \$2 million. The tax credit certificate must be included with the taxpayer's return for the tax year in which the credit may be redeemed as stated on the tax credit certificate.

(4) Carried over tax credits. If a tax credit is carried over and issued for the tax year immediately following the year in which the investment was made because the \$2 million cap has been reached, the tax credit may be claimed by the taxpayer for the third tax year following the tax year for which the credit is issued. For example, if an individual taxpayer makes an equity investment in December 2012 and the \$2 million cap for the fiscal year ending June 30, 2013, had already been reached, the tax credit will be issued for the tax year ending December 31, 2013, and cannot be redeemed until the tax year ending December 31, 2016.

(5) Limitations. Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is the earlier. The tax credit cannot be carried back to a tax year prior to the tax year in which the taxpayer claims the tax credit. The tax credit is not transferable to any other taxpayer.

(6) Pro rata tax credit claims for certain business entities. For equity investments made in a community-based seed capital fund or equity investments made in a qualifying business on or after January 1, 2004, an individual may claim the credit if the investment was made by a partnership, S corporation, limited liability company, or an estate or trust electing to have the income directly taxed to the individual. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, S corporation, limited liability company, or estate or trust.

c. Equity investments in a qualifying business on or after July 2, 2015. For equity investments made on or after July 2, 2015, see 261—Chapter 115 for information regarding eligibility for qualifying businesses, applications for the investment tax credit for equity investments in a qualifying business, and the issuance of tax credit certificates by the economic development authority.

(1) Certificate issuance. The department of revenue will be notified by the economic development authority when the tax credit certificates are issued.

(2) Amount of the tax credit. For fiscal years beginning July 1, 2011, the amount of the tax credits authorized cannot exceed \$2 million. The credit is equal to 25 percent of the taxpayer's equity investment in a qualifying business. In any one calendar year, the amount of tax credits issued for any one qualifying business shall not exceed \$500,000. The maximum amount of tax credit that may be issued per calendar year to a natural person and the person's spouse or dependent shall not exceed \$100,000 combined. For purposes of this paragraph, "dependent" has the same meaning as provided by the Internal Revenue Code.

(3) Year in which the tax credit may be claimed. A taxpayer shall not claim a tax credit prior to September 1, 2016. The tax credit certificate must be included with the taxpayer's return for the tax year in which the credit may be redeemed as stated on the tax credit certificate. For purposes of this paragraph, an investment shall be deemed to have been made on the same date as the date of acquisition of the equity interest as determined by the Internal Revenue Code.

(4) Pro rata tax credit claims for certain business entities. An individual may claim the credit if the investment was made by a partnership, S corporation, limited liability company, or an estate or trust electing to have the income directly taxed to the individual. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, S corporation,

limited liability company, or estate or trust. Any credits claimed by an individual are subject to the limitations provided in 42.22(1)“c”(2) above.

(5) Refundability. For a tax credit claimed against the taxes imposed in Iowa Code chapter 422, division II, any tax credit in excess of the tax liability is refundable. In lieu of claiming a refund, the taxpayer may elect to have the overpayment shown on the taxpayer’s final completed return credited to the tax liability for the following tax year.

(6) Transfers and carryback of tax credits prohibited. The tax credit cannot be carried back to a tax year prior to the tax year in which the taxpayer claims the tax credit. The tax credit is not transferable to any other taxpayer.

42.22(2) *Investment tax credit for an equity investment in a venture capital fund.* See rule 123—3.1(15E) for the discussion of the investment tax credit for an equity investment in a venture capital fund, along with the issuance of tax credit certificates by the Iowa capital investment board. This credit is repealed for investments in venture capital funds made after July 1, 2010.

The department of revenue will be notified by the Iowa capital investment board when the tax credit certificates are issued. The tax credit certificate must be attached to the taxpayer’s return for the tax year in which the credit may be redeemed as stated on the tax credit certificate.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is the earlier.

For equity investments made in a venture capital fund, an individual may claim the credit if the investment was made by a partnership, S corporation, limited liability company, or an estate or trust electing to have the income directly taxed to the individual. The amount claimed by an individual must be based on the individual’s pro rata share of the individual’s earnings of the partnership, S corporation, limited liability company, or estate or trust.

42.22(3) *Contingent tax credit for investments in Iowa fund of funds.* See rule 123—4.1(15E) for the discussion of the contingent tax credit available for investments made in the Iowa fund of funds organized by the Iowa capital investment corporation. Tax credit certificates related to the contingent tax credits will be issued by the Iowa capital investment board.

The department of revenue will be notified by the Iowa capital investment board when these tax credit certificates are issued and, if applicable, when they are redeemed. If the tax credit certificate is redeemed, the certificate must be attached to the taxpayer’s return for the tax year in which the credit may be redeemed as stated on the tax credit certificate.

If the tax credit certificate is redeemed, any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following seven years or until used, whichever is the earlier.

If the tax credit certificate is redeemed, an individual may claim the credit if the investment was made by a partnership, S corporation, limited liability company, or an estate or trust electing to have the income directly taxed to the individual. The amount claimed by an individual must be based on the individual’s pro rata share of the individual’s earnings of the partnership, S corporation, limited liability company, or estate or trust.

42.22(4) *Innovation fund investment tax credit.* See 261—Chapter 116 for information regarding eligibility for an innovation fund, applications for the investment tax credit for investments in an innovation fund, and the issuance of tax credit certificates by the economic development authority.

The department of revenue will be notified by the economic development authority when the tax credit certificates are issued. The credit is equal to 20 percent of the taxpayer’s equity investment in the form of cash in an innovation fund for tax years beginning and investments made on or after January 1, 2011, and before January 1, 2013. For tax years beginning and investments made on or after January 1, 2013, the taxpayer may claim a tax credit equal to 25 percent of the taxpayer’s equity investment in the form of cash in an innovation fund. An investment shall be deemed to have been made on the same date as the date of acquisition of the equity interest as determined by the Internal Revenue Code. A taxpayer shall claim the tax credit for the tax year in which the investment is made. For fiscal years beginning July 1, 2011, the amount of tax credits authorized cannot exceed \$8 million. No tax credit certificates will be issued prior to September 1, 2014. The tax credit certificate must be attached to the taxpayer’s return for the tax year in which the investment was made as stated on the tax credit certificate.

If a tax credit is carried over and issued for the tax year immediately following the year in which the investment was made because the \$8 million cap has been reached, the tax credit may be claimed by the taxpayer for the tax year following the tax year for which the credit is issued. For example, if an individual taxpayer makes an equity investment in December 2013 and the \$8 million cap for the fiscal year ending June 30, 2014, had already been reached, the tax credit will be issued for the tax year ending December 31, 2014, and can be redeemed for the tax year ending December 31, 2014.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until depleted, whichever is the earlier. The tax credit cannot be carried back to a tax year prior to the tax year in which the taxpayer claims the tax credit.

The innovation fund tax credit certificate may be transferred once to any person or entity.

Within 90 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department, along with a statement which contains the transferee's name, address and tax identification number and the amount of the tax credit being transferred. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department will issue a replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company, S corporation, or estate or trust claiming the credit for individual or corporation income tax, the transferee shall provide a list of the partners, members, shareholders or beneficiaries and information on how the innovation fund tax credit should be divided among the partners, members, shareholders or beneficiaries. The transferee shall also provide the tax identification numbers and addresses of the partners, members, shareholders or beneficiaries. The replacement tax credit certificate must contain the same information as that on the original tax credit certificate and must have the same effective taxable year and the same expiration date as the original tax credit certificate. The replacement tax credit certificate may reflect a different tax type than the original tax credit certificate.

The transferee may use the amount of the tax credit for any tax year for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit certificate shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit certificate shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

For equity investments made in an innovation fund, an individual may claim the credit if the investment was made by a partnership, S corporation, limited liability company, estate or trust electing to have the income directly taxed to the individual. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, S corporation, limited liability company, or estate or trust.

This rule is intended to implement Iowa Code sections 15E.51, 15E.52, 15E.66, 422.11F, and 422.11G and section 15E.43 as amended by 2015 Iowa Acts, chapter 138.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10; ARC 9966B, IAB 1/11/12, effective 2/15/12; ARC 1102C, IAB 10/16/13, effective 11/20/13; ARC 1665C, IAB 10/15/14, effective 11/19/14; ARC 2632C, IAB 7/20/16, effective 8/24/16]

701—42.23(15) New capital investment program tax credits. Effective for tax periods beginning on or after January 1, 2003, a business which qualifies under the new capital investment program is eligible to receive tax credits. An eligible business under the new capital investment program must be approved by the Iowa department of economic development and meet the qualifications of 2003 Iowa Acts, chapter 125, section 4. The new capital investment program was repealed on July 1, 2005, and has been replaced with the high quality job creation program. See rule 701—42.29(15) for information on the tax credits available under the high quality job creation program. Any tax credits earned by businesses approved under the new capital investment program prior to July 1, 2005, remain valid and can be claimed on tax returns filed after July 1, 2005.

42.23(1) Research activities credit. A business approved under the new capital investment program is eligible for an additional research activities credit as described in 701—subrule 52.7(5). This credit for increasing research activities is in lieu of the research activities credit described in subrule 42.11(3).

42.23(2) Investment tax credit.

a. General rule. An eligible business can claim an investment tax credit equal to a percentage of the new investment directly related to new jobs created by the location or expansion of an eligible business. The percentage is equal to the amount provided in paragraph “b.” New investment directly related to new jobs created by the location or expansion of an eligible business includes the following:

(1) The cost of machinery and equipment, as defined in Iowa Code section 427A.1(1), paragraphs “e” and “j,” purchased for use in the operation of the eligible business. The purchase price shall be depreciated in accordance with generally accepted accounting principles.

(2) The purchase price of real property and any buildings and structures located on the real property.

(3) The cost of improvements made to real property which is used in the operation of the eligible business.

For eligible businesses approved by the Iowa department of economic development on or after March 17, 2004, certain lease payments made by eligible businesses to a third-party developer will be considered to be new investment for purposes of computing the investment tax credit. The eligible business shall enter into a lease agreement with the third-party developer for a minimum of five years. The investment tax credit is based on the annual base rent paid to a third-party developer by the eligible business for a period not to exceed ten years. The total costs of the annual base rent payments for the ten-year period cannot exceed the cost of the land and the third-party developer’s cost to build or renovate the building used by the eligible business. The annual base rent is defined as the total lease payment less taxes, insurance and operating and maintenance expenses.

Any credit in excess of the tax liability for the tax period may be carried forward seven years or until used, whichever is the earlier.

If the business is a partnership, S corporation, limited liability company, cooperative organized under Iowa Code chapter 501 and filing as a partnership for federal tax purposes, or estate or trust electing to have the income taxed directly to an individual, an individual may claim the credit. The amount of the credit claimed by an individual must be based on the individual’s pro rata share of the individual’s earnings of the partnership, S corporation, limited liability company, cooperative organized under Iowa Code chapter 501 and filing as a partnership for federal tax purposes, or estate or trust.

b. Tax credit percentage. The amount of tax credit claimed shall be based on the number of high quality jobs created as determined by the Iowa department of economic development:

(1) If no high quality jobs are created but economic activity within Iowa is advanced, the eligible business may claim a tax credit of up to 1 percent of the new investment.

(2) If 1 to 5 high quality jobs are created, the eligible business may claim a tax credit of up to 2 percent of the new investment.

(3) If 6 to 10 high quality jobs are created, the eligible business may claim a tax credit of up to 3 percent of the new investment.

(4) If 11 to 15 high quality jobs are created, the eligible business may claim a tax credit of up to 4 percent of the new investment.

(5) If 16 or more high quality jobs are created, the eligible business may claim a tax credit of up to 5 percent of the new investment.

c. Investment tax credit—value-added agricultural products or biotechnology-related processes. An eligible business whose project primarily involves the production of value-added agricultural products or uses biotechnology-related processes may elect to receive a refund for all or a portion of an unused investment tax credit. An eligible business includes a cooperative described in Section 521 of the Internal Revenue Code whose project primarily involves the production of ethanol.

Eligible businesses that elect to receive a refund shall apply to the Iowa department of economic development for tax credit certificates between May 1 and May 15 of each fiscal year through the fiscal year ending June 30, 2009. The election to receive a refund of all or a portion of an unused investment tax credit is no longer available beginning with the fiscal year ending June 30, 2010. Only those businesses that have completed projects before the May 1 filing date may apply for a tax credit certificate. The Iowa department of economic development shall not issue tax credit certificates for more than \$4 million during a fiscal year to eligible businesses for this program and eligible businesses described in subrule

42.14(2). If applications are received for more than \$4 million, the applicants shall receive certificates for a prorated amount.

The economic development authority shall issue tax credit certificates within a reasonable period of time. Tax credit certificates are valid for the tax year following project completion. The tax credit certificate must be included with the tax return for the tax year during which the tax credit is claimed. The tax credit certificate shall not be transferred, except for a cooperative described in Section 521 of the Internal Revenue Code whose project primarily involves the production of ethanol, as provided in subrule 42.14(2). For value-added agricultural projects involving ethanol, the cooperative must submit a list of its members and the share of each member's interest in the cooperative. The economic development authority shall issue a tax credit certificate to each member on the list.

d. Repayment of benefits. If an eligible business fails to maintain the requirements of the new capital investment program, the taxpayer may be required to repay all or a portion of the tax incentives taken on Iowa returns. Irrespective of the fact that the statute of limitations to assess the taxpayer for repayment of the tax credits may have expired, the department may proceed to collect the tax incentives forfeited by failure to maintain the requirements of the new capital investment program. This repayment is required because it is a recovery of an incentive, rather than an adjustment to the taxpayer's tax liability. Details on the calculation of the repayment can be found in 261—subrule 187.5(4) of the administrative rules of the economic development authority. If the business is a partnership, limited liability company, S corporation, estate or trust where the income of the taxpayer is taxed to the individual owner(s) of the business, the department may proceed to collect the tax incentives against the partners, members, shareholders or beneficiaries to whom the tax incentives were passed through. See Decision of the Administrative Law Judge in *Damien & Colette Trebilcock, et al.*, Docket No. 11DORF 042-044, June 11, 2012.

An eligible business in the new capital investment program may also be required to repay all or a portion of the tax incentives received on Iowa returns if the eligible business experiences a layoff of employees in Iowa or closes any of its facilities in Iowa.

If, within five years of purchase, the eligible business sells, disposes of, razes, or otherwise renders unusable all or a part of the land, buildings, or other existing structures for which a tax credit was claimed under this subrule, the income tax liability of the eligible business shall be increased by one of the following amounts:

- (1) One hundred percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within one full year after being placed in service.
- (2) Eighty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within two full years after being placed in service.
- (3) Sixty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within three full years after being placed in service.
- (4) Forty percent of the tax credit claimed if the property ceases to be eligible for the tax credit within four full years after being placed in service.
- (5) Twenty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within five full years after being placed in service.

This rule is intended to implement Iowa Code section 15.333 as amended by 2010 Iowa Acts, Senate File 2380, and sections 15.335 and 15.381 to 15.387.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.24(15E,422) Endow Iowa tax credit. Effective for tax years beginning on or after January 1, 2003, a taxpayer who makes an endowment gift to an endow Iowa qualified community foundation may qualify for an endow Iowa tax credit, subject to the availability of the credit. For tax years beginning on or after January 1, 2003, but before January 1, 2010, the credit is equal to 20 percent of a taxpayer's endowment gift to an endow Iowa qualified community foundation approved by the Iowa department of economic development. For tax years beginning on or after January 1, 2010, the credit is equal to 25 percent of a taxpayer's endowment gift to an endow Iowa qualified community foundation approved by

the Iowa department of economic development. For tax years beginning on or after January 1, 2010, a taxpayer cannot claim a deduction for charitable contributions under Section 170 of the Internal Revenue Code for the amount of the contribution for which the tax credit is claimed for Iowa tax purposes. The administrative rules for the endow Iowa tax credit for the Iowa department of economic development may be found under 261—Chapter 47.

The total amount of endow Iowa tax credits available is \$2 million in the aggregate for the 2003 and 2004 calendar years. The total amount of endow Iowa tax credits is \$2 million annually for the 2005-2007 calendar years, and \$200,000 of these tax credits on an annual basis is reserved for endowment gifts of \$30,000 or less. The maximum amount of tax credit granted to a single taxpayer shall not exceed \$100,000 for the 2003-2007 calendar years. The total amount of endow Iowa tax credits annually for the 2008 and 2009 calendar years is \$2 million plus a percentage of the tax imposed on the adjusted gross receipts from gambling games in accordance with Iowa Code section 99F.11(3). The total amount of endow Iowa tax credits annually for 2010 is \$2.7 million plus a percentage of the tax imposed on the adjusted gross receipts from gambling games in accordance with Iowa Code section 99F.11(3). The total amount of endow Iowa tax credits annually for 2011 is \$3.5 million plus a percentage of the tax imposed on the adjusted gross receipts from gambling games in accordance with Iowa Code section 99F.11(3). The maximum amount of tax credit granted to a single taxpayer shall not exceed 5 percent of the total endow Iowa tax credit amount authorized for 2008 and subsequent years. For the 2012 calendar year and subsequent calendar years, the total amount of endow Iowa tax credits is \$6 million; the maximum amount of tax credit authorized to a single taxpayer is \$300,000 (\$6 million multiplied by 5 percent). The endow Iowa tax credit cannot be transferred to any other taxpayer.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is the earlier.

If a taxpayer is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement Iowa Code section 15E.305 as amended by 2013 Iowa Acts, House File 620, and section 422.11H.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10; ARC 9876B, IAB 11/30/11, effective 1/4/12; ARC 0398C, IAB 10/17/12, effective 11/21/12; ARC 1138C, IAB 10/30/13, effective 12/4/13]

701—42.25(422) Soy-based cutting tool oil tax credit. Effective for tax periods ending after June 30, 2005, and beginning before January 1, 2007, a manufacturer may claim a soy-based cutting tool oil tax credit. A manufacturer, as defined in Iowa Code section 428.20, may claim the credit equal to the costs incurred during the tax year for the purchase and replacement costs relating to the transition from using nonsoy-based cutting tool oil to using soy-based cutting tool oil.

All of the following conditions must be met to qualify for the tax credit:

1. The costs must be incurred after June 30, 2005, and before January 1, 2007.
2. The costs must be incurred in the first 12 months of the transition from using nonsoy-based cutting tool oil to using soy-based cutting tool oil.
3. The soy-based cutting tool oil must contain at least 51 percent soy-based products.
4. The costs of the purchase and replacement must not exceed \$2 per gallon of soy-based cutting tool oil used in the transition.
5. The number of gallons used in the transition cannot exceed 2,000 gallons.
6. The manufacturer shall not deduct for Iowa income tax purposes the costs incurred in the transition to using soy-based cutting tool oil which are deductible for federal tax purposes.

Any credit in excess of the taxpayer's tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

If a taxpayer is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to an individual, an individual may claim the credit. The amount

claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement Iowa Code section 422.11I.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.26(15I,422) Wage-benefits tax credit. Effective for tax years ending on or after June 9, 2006, a wage-benefits tax credit equal to a percentage of the annual wages and benefits paid for a qualified new job created by the location or expansion of the business in Iowa is available for qualified businesses.

42.26(1) Definitions. The following definitions are applicable to this rule:

"Average county wage" means the annualized average hourly wage calculated by the Iowa department of economic development using the most current four quarters of wage and employment information as provided in the Quarterly Covered Wage and Employment Data report provided by the department of workforce development. Agricultural/mining and governmental employment categories are deleted in compiling the wage information.

"Benefits" means all of the following:

1. Medical and dental insurance plans.
2. Pension and profit-sharing plans.
3. Child care services.
4. Life insurance coverage.
5. Vision insurance plan.
6. Disability coverage.

"Department" means the Iowa department of revenue.

"Full-time" means the equivalent of employment of one person:

1. For 8 hours per day for a five-day, 40-hour workweek for 52 weeks per year, including paid holidays, vacations, and other paid leave, or
2. The number of hours or days per week, including paid holidays, vacations, and other paid leave, currently established by schedule, custom or otherwise, as constituting a week of full-time work for the kind of service an individual performs for an employing unit.

"Grow Iowa values fund" means the grow Iowa values fund created in Iowa Code Supplement section 15G.108.

"Nonqualified new job" means any one of the following:

1. A job previously filled by the same employee in Iowa.
2. A job that was relocated from another location in Iowa.
3. A job that is created as a result of a consolidation, merger, or restructuring of a business entity if the job does not represent a new job in Iowa.

"Qualified new job" or *"job creation"* means a job that meets all of the following criteria:

1. Is a new full-time job that has not existed in the business in Iowa within the previous 12 months.
2. Is filled by a new employee for at least 12 months.
3. Is filled by a resident of the state of Iowa.
4. Is not created as a result of a change in ownership.
5. Was created on or after June 9, 2005.

"Retail business" means a business which sells its product directly to a consumer.

"Retained qualified new job" or *"job retention"* means the continued employment, after the first 12 months of employment, of the same employee in a qualified new job for another 12 months.

"Service business" means a business which is not engaged in the sale of tangible personal property, and which provides services to a local consumer market and does not have a significant proportion of its sales coming from outside Iowa.

42.26(2) Calculation of credit. A business which is not a retail or service business may claim the wage-benefits tax credit which is determined as follows:

- a. If the annual wages and benefits for the qualified new job equal less than 130 percent of the average county wage, the credit is 0 percent of the annual wage and benefits paid.

b. If the annual wages and benefits for the qualified new job equal at least 130 percent but less than 160 percent of the average county wage, the credit is 5 percent of the annual wage and benefits paid for each qualified new job.

c. If the annual wages and benefits for the qualified new job equal at least 160 percent of the average county wage, the credit is 10 percent of the annual wage and benefits paid for each qualified new job.

If the business is a partnership, S corporation, limited liability company, or estate or trust electing to have the income taxed directly to the individual, an individual may claim the tax credit. The amount claimed by the individual shall be based upon the pro rata share of the individual's earnings of the partnership, S corporation, limited liability company, or estate or trust.

Any credit in excess of the taxpayer's tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

42.26(3) *Application for the tax credit; tax credit certificate; amount of tax credit available.*

a. In order to claim the wage-benefits tax credit, the business must submit an application to the department along with information on the qualified new job or retained qualified new job. The application cannot be submitted until the end of the twelfth month after the qualified job was filled. For example, if the new job was created on June 9, 2005, the application cannot be submitted until June 9, 2006. The following information must be submitted in the application:

- (1) Name, address and federal identification number of the business.
- (2) A description of the activities of the business. If applicable, the proportion of the sales of the business which come from outside Iowa shall be included.
- (3) The amount of wages and benefits paid to each employee for each new job for the previous 12 months.
- (4) A computation of the amount of credit being requested.
- (5) The address and state of residence of each new employee.
- (6) The date that the qualified new job was filled.
- (7) An indication of whether the job is a qualified new job or a retained qualified new job for which an application was filed for a previous year.
- (8) The type of tax for which the credit will be applied.
- (9) If the business is a partnership, S corporation, limited liability company, or estate or trust, a schedule of the partners, shareholders, members or beneficiaries. This schedule shall include the names, addresses and federal identification numbers of the partners, shareholders, members or beneficiaries, along with their percentage of the pro rata share of earnings of the partnership, S corporation, limited liability company, or estate or trust.

b. Upon receipt of the application, the department has 45 days either to approve or deny the application. If the department does not act on the application within 45 days, the application is deemed approved. If the department denies the application, the business may appeal the decision to the Iowa economic development board within 30 days of the notice of denial.

c. If the application is approved, or if the Iowa economic development board approves the application that was previously denied by the department, a tax credit certificate will be issued by the department to the business, subject to the availability of the amount of credits that may be issued. The tax credit certificate shall contain the name, address and tax identification number of the business (or individual, estate or trust, if applicable), the date of the qualified new job(s), the wage and benefits paid for each job(s) for the 12-month period, the amount of the credit, the tax period for which the credit may be applied, and the type of tax for which the credit will be applied.

d. The tax credit certificates that are issued in a fiscal year cannot exceed \$10 million for the fiscal year ending June 30, 2007, and shall not exceed \$4 million for the fiscal years ending June 30, 2008, through June 30, 2011. The tax credit certificates are issued on a first-come, first-served basis. Therefore, if tax credit certificates have already been issued for the \$10 million limit for the fiscal year ending June 30, 2007, any applications for tax credit certificates received after the \$10 million limit has been reached will be denied. Similarly, if tax credit certificates have already been issued for the \$4 million limit for the fiscal years ending June 30, 2008, through June 30, 2011, any applications for tax credit certificates

received after the \$4 million limit has been reached will be denied. If a business failed to receive all or a part of the tax credit due to the \$10 million or \$4 million limitation, the business may reapply for the tax credit for the retained new job for a subsequent tax period.

e. A business which qualifies for the tax credit for the fiscal year ending June 30, 2007, is eligible to receive the tax credit certificate for each of the fiscal years ending June 30, 2008, through June 30, 2011, subject to the \$4 million limit for tax credits for the fiscal years ending June 30, 2008, through June 30, 2011, if the business retains the qualified new job during each of the fiscal years ending June 30, 2008, through June 30, 2011. The business must reapply by June 30 of each fiscal year for the tax credit, and the percentage of the wages and benefits allowed for the credit set forth in subrule 42.26(2) for the first year is applicable for each subsequent period. Preference will be given in issuing tax credit certificates for those businesses that retain qualified new jobs, and preference will be given in the order in which applications were filed for the fiscal year ending June 30, 2007. Therefore, those businesses which received the first \$4 million of tax credits for the year ending June 30, 2007, in which the qualified jobs were created will automatically receive a tax credit for the fiscal years ending June 30, 2008, through June 30, 2011, as long as the qualified jobs are retained and an application is completed.

f. For the fiscal years ending June 30, 2008, through June 30, 2011, if credits become available because the jobs were not retained by businesses which received the first \$4 million of credits for the year ending June 30, 2007, an application which was originally denied will be considered in the order in which the application was received for the fiscal year ending June 30, 2007.

EXAMPLE: Wage-benefits tax credits of \$4 million are issued for the fiscal year ending June 30, 2007, relating to applications filed between July 1, 2006, and March 31, 2007. For the next fiscal year ending June 30, 2008, the same businesses that received the \$4 million in wage-benefits tax credits filed applications totaling \$3 million for the retained jobs for which the application for the prior year was filed on or before March 31, 2007. The first \$3 million of the available \$4 million will be allowed to these same businesses. The remaining \$1 million that is still available for the fiscal year ending June 30, 2008, will be allowed for those retained jobs for which applications for the prior year were filed starting on April 1, 2007, until the remaining \$1 million in tax credits is issued.

g. A business may apply in writing to the Iowa economic development board for a waiver of the average wage and benefit requirement. If a waiver is granted, the business must provide the department with the waiver and it must be attached to the application.

h. A business may receive other federal, state, and local incentives and tax credits in addition to the wage-benefits tax credit. However, a business that receives a wage-benefits tax credit cannot receive tax incentives under the high quality job creation program set forth in Iowa Code chapter 15 or moneys from the grow Iowa values fund.

42.26(4) Examples. The following noninclusive examples illustrate how this rule applies:

EXAMPLE 1: Business A operates a grocery store and hires five new employees, each of whom will earn wages and benefits in excess of 130 percent of the average county wage. Business A would not qualify for the wage-benefits tax credit because Business A is a retail business.

EXAMPLE 2: Business B operates an accounting firm and hires two new accountants, each of whom will earn wages and benefits in excess of 160 percent of the average county wage. The accounting firm provides services to clients wholly within Iowa. Business B would not qualify for the wage-benefits tax credit because it is a service business. The majority of its sales are generated from within the state of Iowa and thus Business B, because it is a service business, is not eligible for the credit.

EXAMPLE 3: Business C operates a software development business and hires two new programmers, each of whom will earn wages and benefits in excess of 160 percent of the average county wage. Over 50 percent of the customers of Business C are located outside Iowa. Business C would qualify for the wage-benefits tax credit because a majority of its sales are coming from outside the state, even though Business C is engaged in the performance of services.

EXAMPLE 4: Business D is a manufacturer that hires a new employee in Clayton County, Iowa, on July 8, 2005. The average county wage for Clayton County for the third quarter of 2005 is \$11.86 per hour. If the average county wage per hour for Clayton County is \$11.95 for the fourth quarter of 2005, \$12.05 for the first quarter of 2006, and \$12.14 for the second quarter of 2006, the annualized

average county wage for this 12-month period is \$12.00 per hour. This wage equates to an average annual wage of \$24,960 ($\$12.00 \times 40 \text{ hours} \times 52 \text{ weeks}$). In order for Business D to qualify for the 5 percent wage-benefits tax credit, the new employee must receive wages and benefits totaling \$32,448 (130 percent of \$24,960) for the 12-month period from July 8, 2005, through July 7, 2006. In order for Business D to qualify for the 10 percent wage-benefits tax credit, the new employee must receive wages and benefits totaling \$39,936 (160 percent of \$24,960) for the 12-month period from July 8, 2005, through July 7, 2006.

EXAMPLE 5: Business E is a manufacturer that hires three new employees in Grundy County, Iowa, on July 1, 2005. If the average county wage for the 12-month period from July 1, 2005, through June 30, 2006, is \$13.75 per hour in Grundy County, this wage equates to an average county wage of \$28,600. The wages and benefits for each of these three new employees is \$40,000 for the period from July 1, 2005, through June 30, 2006, which is 140 percent of the average county wage. Business E is entitled to a wage-benefits tax credit of \$2,000 for each employee ($\$40,000 \times 5 \text{ percent}$), for a total wage-benefits tax credit of \$6,000. If Business E files on a calendar-year basis, the \$6,000 wage-benefits tax credit can be claimed on the tax return for the period ending December 31, 2006.

EXAMPLE 6: Business F is a manufacturer that hires ten new employees on July 1, 2005, and qualifies for the wage-benefits tax credit because the wages and benefits paid exceed 130 percent of the average county wage. Business F receives a wage-benefits tax credit in July 2006 for these ten employees, which can be used on the tax return for the period ending December 31, 2006. On August 31, 2006, two of the employees leave the business and are replaced by two new employees. Business F is entitled to a wage-benefits tax credit for only eight employees in July 2007 because only eight employees continued employment for the subsequent 12 months in a job which meets the definition of a retained qualified new job. Business F cannot request a wage-benefits tax credit for the two employees hired on August 31, 2006. Business F cannot request the wage-benefits tax credit because these two full-time jobs existed in the business within the previous 12 months in Iowa, and these jobs do not meet the definition of a qualified new job or retained qualified new job.

EXAMPLE 7: Business G is a manufacturer that hires ten new employees on July 1, 2005, and qualifies for the wage-benefits tax credit because the wages and benefits paid exceed 130 percent of the average county wage. Business G receives a wage-benefits tax credit in July 2006 for these ten employees equal to 5 percent of the wages and benefits paid. On October 1, 2006, Business G hires an additional five employees, each of whom receives wages and benefits in excess of 130 percent of the average county wage. Business G can apply for the wage-benefits tax credit on October 1, 2007, for these five employees, since these employees have now been employed for 12 months. However, the credit may not be allowed if more than \$4 million of retained job tax credits have been issued for the fiscal year ending June 30, 2008.

EXAMPLE 8: Assume the same facts as Example 6, except that the \$10 million limit of tax credits has already been met for the fiscal year ending June 30, 2007, and Business F hired five new employees on August 31, 2006. Business F can apply for the wage-benefits tax credit for the three employees on August 31, 2007, a number which is above the ten full-time jobs originally created, but Business F may not receive the tax credit if more than \$4 million of retained job tax credits have been issued for the fiscal year ending June 30, 2008.

EXAMPLE 9: Assume the same facts as Example 7, except that the ten employees hired on July 1, 2005, by Business G received wages and benefits equal to 155 percent of the average county wage, and the five employees hired on October 1, 2006, by Business G received wages equal to 161 percent of the average county wage. Business G can apply for the tax credit on October 1, 2007, equal to 10 percent of the wages and benefits paid for the employees hired on October 1, 2006. On July 1, 2007, Business G can reapply for the tax credit equal to 5 percent of the wages and benefits paid only for the ten employees originally hired on July 1, 2005, even if the wages and benefits for these ten employees exceed 160 percent of the average county wage for the period from July 1, 2006, through June 30, 2007.

42.26(5) *Repeal of the wage-benefits tax credit.* The wage-benefits tax credit is repealed effective July 1, 2008. However, the wage-benefits tax credit is still available through the fiscal year ending June

30, 2011, as provided in subrule 42.26(3), paragraphs “d,” “e,” and “f.” A business is not entitled to a wage-benefits tax credit for a qualified new job created on or after July 1, 2008.

This rule is intended to implement Iowa Code chapter 15I and section 422.11L.
[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.27(422,476B) Wind energy production tax credit. Effective for tax years beginning on or after July 1, 2006, an owner of a qualified wind energy production facility that has been approved by the Iowa utilities board may claim a wind energy production tax credit for qualified electricity sold by the owner or used for on-site consumption against a taxpayer’s Iowa individual income tax liability. The administrative rules for the certification of eligibility for the wind energy production tax credit for the Iowa utilities board may be found in rule 199—15.18(476B).

42.27(1) Application and review process for the wind energy production tax credit. An owner of a wind energy production facility must be approved by the Iowa utilities board in order to qualify for the wind energy production tax credit. The facility must be an electrical production facility that produces electricity from wind, that is located in Iowa, and that is placed in service on or after July 1, 2005, but before July 1, 2012. For applications filed on or after March 1, 2008, a facility must consist of one or more wind turbines which have a combined nameplate generating capacity of at least 2 megawatts and no more than 30 megawatts. For applications filed on or after July 1, 2009, by a private college or university, community college, institution under the control of the state board of regents, public or accredited nonpublic elementary and secondary school, or public hospital as defined in Iowa Code section 249J.3, the facility must have a combined nameplate generating capacity of no less than $\frac{3}{4}$ of a megawatt.

The maximum amount of nameplate generating capacity for all qualified wind energy production facilities cannot exceed 50 megawatts. An owner shall not own more than two qualified facilities. A facility that is not operational within 18 months after issuance of the approval from the Iowa utilities board will no longer be considered a qualified facility. However, a facility that is not operational within 18 months due to the unavailability of necessary equipment shall be granted an additional 12 months to become operational.

An owner of the qualified facility must apply to the Iowa utilities board for the wind energy production tax credit. The application for the tax credit must be filed no later than 30 days after the close of the tax year for which the credit is applied. The information to be included in the application is set forth in 199—subrule 15.20(1).

42.27(2) Computation of the credit. The wind energy production credit equals one cent multiplied by the number of kilowatt-hours of qualified electricity sold or used for on-site consumption by the owner during the tax year. For the first tax year in which the credit is applied, the kilowatt-hours of qualified electricity sold may exceed 12 months.

EXAMPLE: A qualified facility was placed in service on April 1, 2006, and the taxpayer files on a calendar-year basis. The first year for which the credit can be claimed is the period ending December 31, 2007, since that is the first tax year that began on or after July 1, 2006. The credit for the 2007 tax year can include electricity sold between April 1, 2006, and December 31, 2007.

The credit is not allowed for any kilowatt-hours of electricity sold to a related person. The definition of “related person” uses the same criteria set forth in Section 45(e)(4) of the Internal Revenue Code relating to the federal renewable electricity production credit. Persons shall be treated as related to each other if such persons are treated as a single employer under Treasury Regulation § 1.52-1. In the case of a corporation that is a member of an affiliated group of corporations filing a federal consolidated return, such corporation shall be treated as selling electricity to an unrelated person if such electricity is sold to the person by another member of the affiliated group.

The utilities board will notify the department of the number of kilowatt-hours of electricity sold by the qualified facility or generated and used on site by the qualified facility during the tax year. The department will calculate the credit and issue a tax credit certificate to the owner. The tax credit certificate will include the taxpayer’s name, address and federal identification number, the tax type for which the credit will be claimed, the amount of the credit and the tax year for which the credit may be claimed. In addition, the tax credit certificate will include a place for the name and tax identification number of a transferee

and the amount of the tax credit certificate, as provided in subrule 42.27(3). If the department refuses to issue the tax credit certificate, the taxpayer shall be notified in writing and the taxpayer will have 60 days from the date of denial to file a protest in accordance with rule 701—7.8(17A). The department will not issue a tax credit certificate if the facility is not operational within 18 months after approval was given by the utilities board, unless a 12-month extension is granted by the utilities board as provided in subrule 42.27(1).

If the taxpayer is a partnership, limited liability company, S corporation, or estate or trust requesting a credit for individual or corporation income tax, the tax credit certificate will be issued to the partners, members, shareholders or beneficiaries based on the partner's, member's, shareholder's or beneficiary's pro rata share of earnings of the partnership, limited liability company, S corporation, or estate or trust, except when the taxpayer is eligible to receive renewable electricity production tax credits authorized under Section 45 of the Internal Revenue Code. In cases where the taxpayer is eligible to receive renewable electricity production tax credits under Section 45 of the Internal Revenue Code, the partnership, limited liability company or S corporation may designate the amount of the tax credit to be allocated to each partner, member or shareholder. In addition, if a taxpayer is a partnership, limited liability company, S corporation, or estate or trust that is eligible to receive renewable electricity production tax credits under Section 45 of the Internal Revenue Code, the taxpayer may distribute the tax credit to an equity holder or beneficiary as a liquidating distribution, or portion thereof, of an equity holder's interest in the partnership, limited liability company or S corporation, or the beneficiary's interest in the estate or trust.

The credit can be allowed for a ten-year period beginning on the date the qualified facility was originally placed in service. For example, if a facility was placed in service on April 1, 2006, the credit can be claimed for kilowatt-hours of electricity sold between April 1, 2006, and March 31, 2016.

To claim the tax credit, the taxpayer must include the tax credit certificate with the tax return for the tax year set forth on the certificate. Any tax credit in excess of the tax liability may be carried forward for seven years or until it is used, whichever is the earlier.

42.27(3) *Transfer of the wind energy production tax credit certificate.* The wind energy production tax credit certificate may be transferred to any person or entity.

Within 30 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department, along with a statement which contains the transferee's name, address and tax identification number and the amount of the tax credit being transferred. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department will issue a replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company, S corporation, or estate or trust claiming the credit for individual or corporation income tax, the transferee shall provide a list of the partners, members, shareholders or beneficiaries and information on how the wind energy production tax credit should be divided among the partners, members, shareholders or beneficiaries. The transferee shall also provide the tax identification numbers and addresses of the partners, members, shareholders or beneficiaries. The replacement tax credit certificate must contain the same information as that on the original tax credit certificate and must have the same effective taxable year and the same expiration date as the original tax credit certificate. The replacement tax credit certificate may reflect a different tax type than the original tax credit certificate.

The transferee may use the amount of the tax credit for any tax year for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit certificate shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit certificate shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

This rule is intended to implement Iowa Code section 422.11J and Iowa Code chapter 476B as amended by 2011 Iowa Acts, House File 672.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9876B, IAB 11/30/11, effective 1/4/12; ARC 0251C, IAB 8/8/12, effective 9/12/12; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.28(422,476C) Renewable energy tax credit. Effective for tax years beginning on or after July 1, 2006, a purchaser or producer of renewable energy whose facility has been approved by the Iowa utilities board may claim a renewable energy tax credit for qualified renewable energy against a taxpayer's Iowa individual income tax liability.

42.28(1) Eligible facility application process.

a. Eligible facility application process, generally. A producer or purchaser of a renewable energy facility must be approved as an eligible renewable energy facility by the Iowa utilities board in order to qualify for the renewable energy tax credit. The eligible renewable energy facility can be a wind energy conversion facility, biogas recovery facility, biomass conversion facility, methane gas recovery facility, solar energy conversion facility or refuse conversion facility. The facility must be located in Iowa and placed in service on or after July 1, 2005, and before January 1, 2018. The administrative rules for the certification of eligibility for the renewable energy tax credit for the Iowa utilities board may be found in rule 199—15.19(476C).

b. Limitations on maximum energy production and nameplate generating capacity. The maximum amount of nameplate generating capacity of all wind energy conversion facilities cannot exceed 363 megawatts. For tax years beginning prior to January 1, 2015, the maximum amount of energy production capacity for biogas recovery facilities, biomass conversion facilities, methane gas recovery facilities, solar energy conversion facilities and refuse conversion facilities cannot exceed a combined output of 53 megawatts of nameplate generating capacity and 167 billion British thermal units of heat for a commercial purpose. For tax years beginning on or after January 1, 2015, the maximum amount of energy production for biogas recovery facilities, biomass conversion facilities, methane gas recovery facilities, solar energy conversion facilities and refuse conversion facilities cannot exceed a combined output of 63 megawatts of nameplate generating capacity and, annually, 167 billion British thermal units of heat for a commercial purpose. A facility that is not operational within 30 months after issuance of approval from the utilities board will no longer be considered a qualified facility. However, if the facility is a wind energy conversion property and is not operational within 18 months due to the unavailability of necessary equipment, the facility may apply for a 12-month extension of the 30-month limit. Extensions can be renewed for succeeding 12-month periods if the facility applies for the extension prior to expiration of the current extension period. A producer of renewable energy, who is the person who owns the renewable energy facility, cannot own more than two eligible renewable energy facilities. A person that has an equity interest equal to or greater than 51 percent in an eligible renewable energy facility cannot have an equity interest greater than 10 percent in any other renewable energy facility. However, for tax years beginning on or after January 1, 2015, an entity described in Iowa Code section 476C.1(6)“b”(4) or (5) may have an ownership interest in up to four solar energy conversion facilities described in Iowa Code section 476C.3(4)“b”(3).

42.28(2) Tax credit certificate procedure.

a. Tax credit application process. A producer or purchaser of a renewable energy facility must apply to the utilities board for the renewable energy tax credit. The application for the tax credit must be filed no later than 30 days after the close of the tax year for which the credit is applied. The information to be included in the application is set forth in 199—subrule 15.21(1). The utilities board will notify the department of the number of kilowatt-hours, standard cubic feet or British thermal units that were generated and purchased from an eligible facility or used for on-site consumption by the producer during the tax year for which the credit is applied.

b. Tax credit calculation. The department shall calculate the amount of the credit for which the applicant is eligible in accordance with subrules 42.28(3) and 42.28(4) and shall issue a tax credit certificate for that amount or shall notify the applicant in writing of its refusal to do so.

c. Tax credit certificate issuance. The tax credit certificate will include the taxpayer's name, address and federal identification number; the tax type for which the credit will be claimed; the amount of the credit; and the tax year for which the credit may be claimed. In addition, the tax credit certificate will include a place for the name and tax identification number of a transferee and the amount of the tax credit certificate, as provided in subrule 42.28(5). Once a tax credit certificate is issued pursuant to Iowa Code chapter 476C, it shall not be terminated or rescinded.

d. Taxpayers that are partnerships, limited liability companies, S corporations, or estates or trusts. If the taxpayer is a partnership, limited liability company, S corporation, or estate or trust requesting a credit for individual or corporation income tax, the tax credit certificate will be issued to the partners, members, shareholders or beneficiaries based on the partner's, member's, shareholder's or beneficiary's pro rata share of earnings of the partnership, limited liability company, S corporation, or estate or trust, except when the taxpayer is eligible to receive renewable electricity production tax credits authorized under Section 45 of the Internal Revenue Code. In cases where the taxpayer is eligible to receive renewable electricity production tax credits under Section 45 of the Internal Revenue Code, the partnership, limited liability company or S corporation may designate the amount of the tax credit to be allocated to each partner, member or shareholder. In addition, if a taxpayer is a partnership, limited liability company, S corporation, or estate or trust that is eligible to receive renewable electricity production tax credits under Section 45 of the Internal Revenue Code, the taxpayer may distribute the tax credit to an equity holder or beneficiary as a liquidating distribution, or portion thereof, of an equity holder's interest in the partnership, limited liability company or S corporation or of the beneficiary's interest in the estate or trust.

e. Carryforward. To claim the tax credit, the taxpayer must include the tax credit certificate with the tax return for the tax period set forth on the certificate. Any tax credit in excess of the tax liability may be carried forward for seven years or until it is used, whichever is the earlier.

42.28(3) Limitations.

a. Energy production. Of the maximum amount of energy production capacity equivalent for biogas recovery facilities, biomass conversion facilities, methane gas recovery facilities, solar energy conversion facilities and refuse conversion facilities:

(1) No single facility may be allocated more than ten megawatts of nameplate generating capacity or energy production capacity equivalent.

(2) For tax years beginning on or after January 1, 2015, ten megawatts of nameplate generating capacity or energy production capacity equivalent shall be reserved for solar energy conversion facilities described in Iowa Code section 476C.3(4) "b"(3) that have a generating capacity of one and one-half megawatts or less.

(3) For tax years, beginning on or after January 1, 2014, 55 billion British thermal units of heat for a commercial purpose shall be reserved annually for an eligible facility that is a refuse conversion facility for processed, engineered fuel from a multicounty solid waste management planning area.

(4) For tax years beginning on or after January 1, 2014, the maximum annual amount of energy production capacity for a single refuse conversion facility is 55 billion British thermal units of heat for a commercial purpose.

b. Related persons. The credit is not allowed for any kilowatt-hours, standard cubic feet or British thermal units that are purchased from an eligible facility by a related person. Persons shall be treated as related to each other if either person owns an 80 percent or more equity interest in the other person.

c. Operation. The facility must be operational within 30 months after approval was given by the utilities board, unless a 12-month extension is granted by the utilities board as provided in subrule 42.28(1).

d. Prohibited for persons that have received a credit under Iowa Code chapter 476B. A person that has received a wind energy production tax credit pursuant to Iowa Code chapter 476B may not be issued a renewable energy tax credit certificate.

e. Ten-year award limitation. The credit is allowed for a ten-year period beginning on the date the purchaser first purchases renewable energy from a qualified facility or on the date the qualified facility first began producing renewable energy for on-site consumption. For example, if a renewable energy facility first began producing energy for on-site consumption on April 1, 2006, the credit can be claimed for kilowatt-hours, standard cubic feet or British thermal units generated and used for on-site consumption by the producer between April 1, 2006, and March 31, 2016. Tax credit certificates cannot be issued for renewable energy purchased or produced for on-site consumption after December 31, 2027.

42.28(4) Computation of the credit. The renewable energy tax credit equals 1½ cents per kilowatt-hour of electricity, or \$1.44 per 1000 standard cubic feet of hydrogen fuel, or \$4.50 per 1

million British thermal units of methane gas or other biogas used to generate electricity, or \$4.50 per 1 million British thermal units of heat for a commercial purpose generated by and purchased from an eligible renewable energy facility or used for on-site consumption by the producer during the tax year. For the first tax year in which the credit is applied, the kilowatt-hours, standard cubic feet or British thermal units generated by and purchased from the facility or used for on-site consumption by the producer may exceed 12 months if the facility was operational for fewer than 12 months in its initial year of operation.

EXAMPLE: A qualified wind energy production facility was placed in service on April 1, 2006, and the taxpayer files on a calendar-year basis. The first year for which the credit can be claimed is the year ending December 31, 2007, since that is the first tax year that began on or after July 1, 2006. The credit for the 2007 tax year can include electricity generated and purchased or used for on-site consumption by the producer between April 1, 2006, and December 31, 2007.

42.28(5) *Transfer of the renewable energy tax credit certificate.*

a. One-transfer limitation. The renewable energy tax credit certificate may be transferred once to any person or entity. A decision between a producer and purchaser of renewable energy regarding who may claim the tax credit is not considered a transfer.

b. Transfer process—information required. Within 30 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department, along with a statement which contains the transferee's name, address and tax identification number; the amount of the tax credit being transferred; the value of any consideration provided by the transferee to the transferor; and any other information required by the department. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department will issue a replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company, S corporation, or estate or trust claiming the credit for individual or corporation income tax, the transferee shall provide a list of the partners, members, shareholders or beneficiaries and information on how the renewable energy tax credit should be divided among the partners, members, shareholders or beneficiaries. The transferee shall also provide the tax identification numbers and addresses of the partners, members, shareholders or beneficiaries. The replacement tax credit certificate must contain the same information as that on the original tax credit certificate and must have the same effective taxable year and the same expiration date as the original tax credit certificate. The replacement tax credit certificate may reflect a different tax type than the original tax credit certificate.

c. Tax year. The transferee may use the amount of the tax credit for any tax year for which the original transferor could have claimed the tax credit.

d. Consideration. Any consideration received for the transfer of the tax credit certificate shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit certificate shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

42.28(6) *Small wind innovation zones.* Effective for tax years beginning on or after January 1, 2009, an owner of a small wind energy system operating within a small wind innovation zone which has been approved by the Iowa utilities board is eligible for the renewable energy tax credit. The administrative rules of the Iowa utilities board for the certification of eligibility for owners of small wind energy systems operating within a small wind innovation zone may be found in rule 199—15.22(476).

42.28(7) *Appeals.* If the department refuses to issue the tax credit certificate, the taxpayer shall be notified in writing, and the taxpayer will have 60 days from the date of denial to file a protest in accordance with rule 701—7.8(17A).

This rule is intended to implement Iowa Code section 422.11J and Iowa Code chapter 476C as amended by 2015 Iowa Acts, chapter 124, and 2016 Iowa Acts, House File 2468.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9876B, IAB 11/30/11, effective 1/4/12; ARC 0251C, IAB 8/8/12, effective 9/12/12; ARC 1665C, IAB 10/15/14, effective 11/19/14; ARC 2772C, IAB 10/12/16, effective 11/16/16]

701—42.29(15) High quality job creation program. Effective for tax periods ending on or after July 1, 2005, for programs approved on or after July 1, 2005, but before July 1, 2009, a business which

qualifies under the high quality job creation program is eligible to receive tax credits. The high quality job creation program replaces the new jobs and income program and the new capital investment program. An eligible business under the high quality job creation program must be approved by the Iowa department of economic development and meet the qualifications of Iowa Code section 15.329. The administrative rules for the high quality job creation program for the Iowa department of economic development may be found at 261—Chapter 68.

The high quality job creation program was repealed on July 1, 2009, and has been replaced with the high quality jobs program. See rule 701—42.42(15) for information on the investment tax credit and additional research activities credit under the high quality jobs program. Any investment tax credit and additional research activities credit earned by businesses approved under the high quality job creation program prior to July 1, 2009, remains valid and can be claimed on tax returns filed after July 1, 2009.

42.29(1) Research activities credit. An eligible business approved under the high quality job creation program is eligible for an additional research activities credit as described in 701—subrule 52.7(4).

Research activities allowable for the Iowa research activities credit include expenses related to the development and deployment of innovative renewable energy generation components manufactured or assembled in Iowa; such expenses related to the development and deployment of innovative renewable energy generation components are not eligible for the federal credit for increasing research activities. For purposes of this subrule, innovative renewable energy generation components do not include components with more than 200 megawatts in installed effective nameplate generating capacity. The research activities credit related to renewable energy generation components under the high quality job creation program and the enterprise zone program shall not exceed \$1 million in the aggregate.

These expenses related to the development and deployment of innovative renewable energy generation components are applicable only to the additional research activities credit set forth in this subrule and are not applicable to the research activities credit set forth in subrule 42.11(3), paragraphs “a” and “b.” The research activities credit is subject to the threshold amounts of qualifying investment set forth in Iowa department of economic development 261—subrule 68.4(7).

42.29(2) Investment tax credit.

a. General rule. An eligible business can claim an investment tax credit equal to a percentage of the new investment directly related to new jobs created by the location or expansion of an eligible business. The percentage is equal to the amount provided in Iowa department of economic development 261—subrule 68.4(7). New investment directly related to new jobs created by the location or expansion of an eligible business includes the following:

(1) The cost of machinery and equipment, as defined in Iowa Code section 427A.1(1), paragraphs “e” and “j,” purchased for use in the operation of the eligible business. The purchase price shall be depreciated in accordance with generally accepted accounting principles.

(2) The purchase price of real property and any buildings and structures located on the real property.

(3) The cost of improvements made to real property which is used in the operation of the eligible business.

In addition, certain lease payments made by eligible businesses to a third-party developer will be considered to be new investment for purposes of computing the investment tax credit. The eligible business shall enter into a lease agreement with the third-party developer for a minimum of five years. The investment tax credit is based on the annual base rent paid to a third-party developer by the eligible business for a period not to exceed ten years. The total costs of the annual base rent payments for the ten-year period cannot exceed the cost of the land and the third-party developer’s cost to build or renovate the building used by the eligible business. The annual base rent is defined as the total lease payment less taxes, insurance and operating and maintenance expenses.

The investment tax credit can be claimed in the tax year in which the qualifying assets are placed in service. The investment tax credit will be amortized over a five-year period. Any credit in excess of the tax liability for the tax period may be carried forward seven years or until used, whichever is the earlier.

EXAMPLE: An eligible business which files tax returns on a calendar-year basis earned \$100,000 of investment tax credits for new investment made in 2006. The business can claim \$20,000 of investment tax credits for each of the years from 2006 through 2010. The \$20,000 of investment tax credit that

can be claimed in 2006 can be carried forward to the 2007-2013 tax years if the entire credit cannot be claimed on the 2006 return. Similarly, the \$20,000 investment tax credit that can be claimed in 2007 can be carried forward to the 2008-2014 tax years if the entire credit cannot be claimed on the 2007 return.

If the business is a partnership, S corporation, limited liability company, cooperative organized under Iowa Code chapter 501 and filing as a partnership for federal tax purposes, or estate or trust electing to have the income taxed directly to an individual, an individual may claim the credit. The amount of the credit claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, S corporation, limited liability company, cooperative organized under Iowa Code chapter 501 and filing as a partnership for federal tax purposes, or estate or trust electing to have the income taxed directly to an individual.

b. Investment tax credit—value-added agricultural products or biotechnology-related processes. An eligible business whose project primarily involves the production of value-added agricultural products or uses biotechnology-related processes may elect to receive a refund for all or a portion of an unused investment tax credit. An eligible business includes a cooperative described in Section 521 of the Internal Revenue Code whose project primarily involves the production of ethanol.

Eligible businesses that elect to receive a refund shall apply to the Iowa department of economic development for tax credit certificates between May 1 and May 15 of each fiscal year through the fiscal year ending June 30, 2009. The election to receive a refund of all or a portion of an unused investment tax credit is no longer available beginning with the fiscal year ending June 30, 2010. Only those businesses that have completed projects before the May 1 filing date may apply for a tax credit certificate. The Iowa department of economic development shall not issue tax credit certificates for more than \$4 million during a fiscal year to eligible businesses for this program and the enterprise zone program described in subrule 42.14(2). If applications are received for more than \$4 million, the applicants shall receive certificates for a prorated amount.

The economic development authority shall issue tax credit certificates within a reasonable period of time. Tax credit certificates are valid for the tax year following project completion. The tax credit certificate must be included with the tax return for the tax year during which the tax credit is claimed. The tax credit certificate shall not be transferred, except for a cooperative described in Section 521 of the Internal Revenue Code whose project primarily involves the production of ethanol, as provided in subrule 42.14(2). For value-added agricultural projects involving ethanol, the cooperative must submit a list of its members and the share of each member's interest in the cooperative. The economic development authority shall issue a tax credit certificate to each member on the list.

c. Repayment of benefits. If an eligible business fails to maintain the requirements of the high quality job creation program, the taxpayer may be required to repay all or a portion of the tax incentives taken on Iowa returns. Irrespective of the fact that the statute of limitations to assess the taxpayer for repayment of the tax credits may have expired, the department may proceed to collect the tax incentives forfeited by failure of the eligible business to maintain the requirements of the high quality job creation program because the repayment is a recovery of an incentive, rather than an adjustment to the taxpayer's tax liability. Details on the calculation of the repayment can be found in 261—subrule 187.5(4) of the administrative rules of the economic development authority. If the business is a partnership, limited liability company, S corporation, estate or trust where the income of the taxpayer is taxed to the individual owner(s) of the business, the department may proceed to collect the tax incentives against the partners, members, shareholders or beneficiaries to whom the tax incentives were passed through. See Decision of the Administrative Law Judge in *Damien & Colette Trebilcock, et al.*, Docket No. 11DORF 042-044, June 11, 2012.

An eligible business in the high quality job creation program may also be required to repay all or a portion of the tax incentives received on Iowa returns if the eligible business experiences a layoff of employees in Iowa or closes any of its facilities in Iowa.

If, within five years of purchase, the eligible business sells, disposes of, razes, or otherwise renders unusable all or a part of the land, buildings, or other existing structures for which a tax credit was claimed under this subrule, the income tax liability of the eligible business shall be increased by one of the following amounts:

(1) One hundred percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within one full year after being placed in service.

(2) Eighty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within two full years after being placed in service.

(3) Sixty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within three full years after being placed in service.

(4) Forty percent of the tax credit claimed if the property ceases to be eligible for the tax credit within four full years after being placed in service.

(5) Twenty percent of the investment tax credit claimed if the property ceases to be eligible for the tax credit within five full years after being placed in service.

42.29(3) Determination of tax credit amounts. The amount of tax credit claimed under the high quality job creation program shall be based on the number of high quality jobs created and the amount of qualifying investment made as determined by the Iowa department of economic development.

a. If the high quality jobs have a starting wage, including benefits, equal to or greater than 130 percent of the average county wage but less than 160 percent of the average county wage, see Iowa department of economic development 261—paragraph 68.4(7) “a” for the amount of tax credits that may be claimed.

b. If the high quality jobs have a starting wage, including benefits, equal to or greater than 160 percent of the average county wage, see Iowa department of economic development 261—paragraph 68.4(7) “b” for the amount of tax credits that may be claimed.

c. An eligible business approved under the high quality job creation program is not eligible for the wage-benefits tax credit set forth in rule 701—42.26(15I,422).

This rule is intended to implement Iowa Code sections 15.326 to 15.337.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.30(15E,422) Economic development region revolving fund tax credit. Effective for tax years ending on or after July 1, 2005, but beginning before January 1, 2010, a taxpayer who makes a contribution to an economic development region revolving fund may claim a tax credit, subject to the availability of the credit. The tax credit is equal to 20 percent of a taxpayer’s contribution to the economic development region revolving fund approved by the Iowa department of economic development. The administrative rules for the economic development region revolving fund tax credit for the Iowa department of economic development may be found at 261—Chapter 32. The tax credit is repealed for tax years beginning on or after January 1, 2010.

The total amount of economic development region revolving fund tax credits available shall not exceed \$2 million per fiscal year. The tax credit shall not be carried back to a tax year prior to the year in which the taxpayer redeems the credit. The economic development region revolving fund tax credit is not transferable to any other taxpayer.

Any tax credit in excess of the tax liability for the tax year may be credited to the tax liability for the following ten years or until used, whichever is the earlier.

If a taxpayer is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual’s pro rata share of the individual’s earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement Iowa Code sections 15E.232 and 422.11K as amended by 2010 Iowa Acts, Senate File 2380.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10]

701—42.31(422) Early childhood development tax credit. Effective for tax years beginning on or after January 1, 2006, taxpayers may claim a tax credit equal to 25 percent of the first \$1,000 of expenses paid to others for early childhood development for each dependent three to five years of age. The credit is available only to taxpayers whose net income is less than \$45,000. If a taxpayer claims the early childhood development tax credit, the taxpayer cannot claim the child and dependent care credit

described in rule 701—42.15(422). The early childhood development tax credit is refundable to the extent that the credit exceeds the taxpayer's income tax liability. For the tax year beginning in the 2006 calendar year only, amounts paid for early childhood development expenses in November and December of 2005 shall be considered paid in 2006 for purposes of computing the credit.

For married taxpayers who elect to file separately on a combined form or elect to file separate returns for Iowa tax purposes, the combined income of the taxpayers must be less than \$45,000 to be eligible for the credit. If the combined income is less than \$45,000, the early childhood development tax credit shall be prorated to each spouse in the proportion that each spouse's respective net income bears to the total combined income.

42.31(1) Expenses eligible for the credit. The following expenses qualify for the early childhood development tax credit, to the extent they are paid during the time period that a dependent is either three, four or five years of age:

a. Expenses for services provided by a preschool, as defined in Iowa Code section 237A.1. The preschool may only provide services for periods of time not exceeding three hours per day.

b. Books that improve child development, including textbooks, music books, art books, teacher editions and reading books.

c. Expenses paid for instructional materials required to be used in a child development or educational lesson activity. These materials include, but are not limited to, paper, notebooks, pencils, and art supplies. In addition, software and toys which are directly and primarily used for educational or learning purposes are considered instructional materials.

d. Expenses paid for lesson plans and curricula.

e. Expenses paid for child development and educational activities outside the home. These activities include, but are not limited to, drama, art, music and museum activities, including the entrance fees for such activities.

42.31(2) Expenses not eligible for the credit. The following expenses do not qualify for the early childhood development tax credit:

a. Any expenses paid to a preschool once a dependent reaches the age of six.

b. Expenses relating to food, lodging, membership fees, or other nonacademic expenses relating to child development and educational activities outside the home.

c. Expenses related to services, materials, or activities for the teaching of religious tenets, doctrines, or worship, in cases where the purpose of the teaching is to inculcate the religious tenets, doctrines, or worship.

This rule is intended to implement Iowa Code section 422.12C.

[ARC 8702B, IAB 4/21/10, effective 5/26/10]

701—42.32(422) School tuition organization tax credit. Effective for the tax year beginning on or after January 1, 2006, but beginning before January 1, 2007, a school tuition organization tax credit is available which is equal to 65 percent of the amount of the voluntary cash contributions made by a taxpayer to a school tuition organization. For tax years beginning on or after January 1, 2007, the school tuition organization tax credit is available which is equal to 65 percent of the amount of voluntary cash or noncash contributions made by a taxpayer to a school tuition organization. There are numerous federal revenue regulations, rulings, court cases and other provisions relating to the determination of the value of a noncash contribution, and these are equally applicable to the determination of the amount of a school tuition organization tax credit for tax years beginning on or after January 1, 2007.

42.32(1) Definitions. The following definitions are applicable to this rule:

“*Certified enrollment*” means the enrollment at schools served by school tuition organizations as of October 1, or the first Monday in October if October 1 falls on a Saturday or Sunday, of the appropriate year.

“*Contribution*” means a voluntary cash or noncash contribution to a school tuition organization that is not used for the direct benefit of any dependent of the taxpayer or any other student designated by the taxpayer.

“*Eligible student*” means a student residing in Iowa who is a member of a household whose total annual income during the calendar year prior to the school year in which the student receives a tuition grant from a school tuition organization does not exceed an amount equal to three times the most recently published federal poverty guidelines in the Federal Register by the United States Department of Health and Human Services.

“*Qualified school*” means a nonpublic elementary or secondary school in Iowa which is accredited under Iowa Code section 256.11, including a prekindergarten program for students who are five years of age by September 15 of the appropriate year, and adheres to the provisions of the federal Civil Rights Act of 1964 and Iowa Code chapter 216, and which is represented by only one school tuition organization.

“*School tuition organization*” means a charitable organization in Iowa that is exempt from federal taxation under Section 501(c)(3) of the Internal Revenue Code and that does all of the following:

1. Allocates at least 90 percent of its annual revenue in tuition grants for children to allow them to attend a qualified school of their parents’ choice.
2. Awards tuition grants only to children who reside in Iowa.
3. Provides tuition grants to students without limiting availability to students of only one school.
4. Provides tuition grants only to eligible students.
5. Prepares an annual financial statement certified by a public accounting firm.

“*Tuition grant*” means a grant to a student to cover all or part of the student’s tuition at a qualified school.

42.32(2) *Initial registration.* In order for contributions to a school tuition organization to qualify for the credit, the school tuition organization must initially register with the department. The following information must be provided with this initial registration:

- a. Verification from the Internal Revenue Service that Section 501(c)(3) status was granted and that the school tuition organization is exempt from federal income tax.
- b. A list of all qualified schools that the school tuition organization serves.
- c. The names and addresses of all the members of the board of directors of the school tuition organization.

Once the school tuition organization is registered with the department, it is not required to subsequently register unless there is a change in the qualified schools that the organization serves. The school tuition organization must notify the department in writing of any changes in the qualified schools it serves.

42.32(3) *Participation forms.* Each qualified school that is served by a school tuition organization must annually submit a participation form to the department by November 1. The following information must be provided with this participation form:

- a. The certified enrollment of the qualified school as of October 1, or the first Monday in October if October 1 falls on a Saturday or Sunday.
- b. The name of the school tuition organization that represents the qualified school.

For the tax year beginning in the 2006 calendar year only, each qualified school served by a school tuition organization must submit to the department a participation form postmarked on or before August 1, 2006, which provides the certified enrollment as of the third Friday of September 2005, along with the name of the school tuition organization that represents the qualified school.

42.32(4) *Authorization to issue tax credit certificates.*

a. By December 1 of each year, the department will authorize school tuition organizations to issue tax credit certificates for the following tax year. For the tax year beginning in the 2006 calendar year only, the department, by September 1, 2006, will authorize school tuition organizations to issue tax credit certificates for the 2006 calendar year only. The total amount of tax credit certificates that may be authorized is \$2.5 million for the 2006 calendar year, \$5 million for the 2007 calendar year, \$7.5 million for the 2008 through 2011 calendar years, \$8.75 million for the 2012 and 2013 calendar years, and \$12 million for 2014 and subsequent calendar years.

b. The amount of authorized tax credit certificates for each school tuition organization is determined by dividing the total amount of tax credit available by the total certified enrollment of all qualified participating schools. This result, which is the per-student tax credit, is then multiplied by the

certified enrollment of each school tuition organization to determine the tax credit authorized to each school tuition organization.

EXAMPLE: For determining the authorized tax credits for the 2008 calendar year, if the certified enrollment of each qualified school in Iowa, as provided to the department by November 1, 2007, was 37,500, the per-student tax credit would be \$200 (\$7.5 million divided by 37,500). If a school tuition organization located in Scott County represents four qualified schools with a certified enrollment of 1,400 students, the school tuition organization would be authorized to issue \$280,000 (\$200 times 1,400) of tax credit certificates for the 2008 calendar year. The department would notify this school tuition organization by December 1, 2007, of the authorization to issue \$280,000 of tax credit certificates for the 2008 calendar year. This authorization would allow the school tuition organization to solicit contributions totaling \$430,769 (\$280,000 divided by 65%) during the 2008 calendar year which would be eligible for the tax credit.

42.32(5) Issuance of tax credit certificates. The school tuition organization shall issue tax credit certificates to each taxpayer who made a cash or noncash contribution to the school tuition organization. The tax credit certificate, which will be designed by the department, will contain the name, address and tax identification number of the taxpayer, the amount and date that the contribution was made, the amount of the credit, the tax year that the credit may be applied, the school tuition organization to which the contribution was made, and the tax credit certificate number.

For tax years beginning on or after July 1, 2009, a tax credit certificate may be issued to corporation income taxpayers. For tax years beginning on or after January 1, 2013, a tax credit certificate may be issued to a partnership, limited liability company, S corporation, estate or trust. The amount of credit claimed by an individual shall be based on the pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, estate or trust.

42.32(6) Claiming the tax credit. The taxpayer must include the tax credit certificate with the tax return for which the credit is claimed. Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is the earlier.

a. The taxpayer may not claim an itemized deduction for charitable contributions for Iowa income tax purposes for the amount of the contribution made to the school tuition organization.

b. Married taxpayers who file separate returns or file separately on a combined return must allocate the school tuition organization tax credit to each spouse in the proportion that each spouse's respective net income bears to the total combined net income. Nonresidents or part-year residents of Iowa must determine the school tuition organization tax credit in the ratio of their Iowa source net income to their total source net income. In addition, if nonresidents or part-year residents of Iowa are married and elect to file separate returns or to file separately on a combined return, the school tuition organization tax credit must be allocated between the spouses in the ratio of each spouse's Iowa source net income to the combined Iowa source net income.

42.32(7) Reporting requirements. Each school tuition organization that issues tax credit certificates must report to the department, postmarked by January 12 of each tax year, the following information:

a. The names and addresses of all the members of the board of directors of the school tuition organization, along with the name of the chairperson of the board.

b. The total number and dollar value of contributions received by the school tuition organization for the previous tax year.

c. The total number and dollar value of tax credit certificates issued by the school tuition organization for the previous tax year.

d. A list of each taxpayer who received a tax credit certificate for the previous tax year, including the amount of the contribution and the amount of tax credit issued to each taxpayer for the previous tax year. This list should also include the tax identification number of the taxpayer and the tax credit certificate number for each certificate.

e. The total number of children utilizing tuition grants for the school year in progress as of January 12, along with the total dollar value of the tuition grants.

f. The name and address of each qualified school represented by the school tuition organization at which tuition grants are being utilized for the school year in progress.

g. The number of tuition grant students and the total dollar value of tuition grants being utilized for the school year in progress at each qualified school served by the school tuition organization.

This rule is intended to implement Iowa Code section 422.11S as amended by 2013 Iowa Acts, House File 625.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9876B, IAB 11/30/11, effective 1/4/12; ARC 1102C, IAB 10/16/13, effective 11/20/13; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.33(422) E-85 gasoline promotion tax credit. Effective for tax years beginning on or after January 1, 2006, a retail dealer of gasoline may claim an E-85 gasoline promotion tax credit. “E-85 gasoline” means ethanol blended gasoline formulated with a minimum percentage of between 70 percent and 85 percent of volume of ethanol, if the formulation meets the standards provided in Iowa Code section 214A.2. For purposes of this rule, tank wagon sales are considered retail sales. The credit is calculated on Form IA 135.

42.33(1) Claiming the credit.

a. *Amount of the credit.* The credit is calculated by multiplying the total number of E-85 gallons sold by the retail dealer during the tax year by the following designated rates:

| | |
|-------------------------------------|----------|
| Calendar years 2006, 2007, and 2008 | 25 cents |
| Calendar years 2009 and 2010 | 20 cents |
| Calendar year 2011 | 10 cents |
| Calendar years 2012 through 2024 | 16 cents |

b. *Claiming the credit with other credits.* A taxpayer may claim the E-85 gasoline promotion tax credit even if the taxpayer also claims the ethanol blended gasoline tax credit provided in rule 701—42.20(422) for gallons sold prior to January 1, 2009, or the ethanol promotion tax credit provided in rule 701—42.39(422) for gallons sold on or after January 1, 2009, but prior to January 1, 2021, for the same tax year for the same ethanol gallons.

c. *Refundability.* Any credit in excess of the taxpayer’s tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

d. *Transferability.* The credit may not be transferred to any other person.

e. *Example.* A taxpayer operated one retail motor fuel site in 2008 and sold 200,000 gallons of gasoline, of which 160,000 gallons was ethanol blended gasoline. Of these 160,000 gallons, 1,000 gallons was E-85 gasoline. Taxpayer may claim the E-85 gasoline promotion tax credit on the 1,000 gallons of E-85 gasoline sold during 2008. Taxpayer is also entitled to claim the ethanol blended gasoline tax credit of two and one-half cents multiplied by 40,000 gallons, since this constitutes the gallons in excess of 60 percent of the total gasoline gallons sold for the 2008 tax year.

42.33(2) Fiscal year filers. For taxpayers whose tax year is not on a calendar-year basis, the taxpayer may compute the tax credit on the gallons of E-85 gasoline sold during the year using the designated rates as shown above. Because the tax credit is repealed on January 1, 2025, a taxpayer whose tax year ends prior to December 31, 2024, may continue to claim the tax credit in the following tax year for any E-85 gallons sold through December 31, 2024. For a retail dealer whose tax year is not on a calendar-year basis and who did not claim the E-85 credit on the previous return, the dealer may claim the credit for the current tax year for the period beginning on January 1 of the previous tax year until the last day of the previous tax year.

See 701—subrule 52.30(2) for examples illustrating how this subrule is applied.

42.33(3) Allocation of credit to owners of a business entity or to beneficiaries of an estate or trust. If a taxpayer claiming the E-85 ethanol promotion tax credit is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual’s pro rata

share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement Iowa Code section 422.110 as amended by 2016 Iowa Acts, Senate File 2309.

[**ARC 8702B**, IAB 4/21/10, effective 5/26/10; **ARC 9821B**, IAB 11/2/11, effective 12/7/11; **ARC 3043C**, IAB 4/26/17, effective 5/31/17]

701—42.34(422) Biodiesel blended fuel tax credit. Effective for tax years beginning on or after January 1, 2006, a retail dealer of biodiesel blended fuel may claim a biodiesel blended fuel tax credit. “Biodiesel blended fuel” means a blend of biodiesel with petroleum-based diesel fuel that meets the standards provided in Iowa Code section 214A.2. In determining the minimum percentage by volume of biodiesel, the department will take into account reasonable variances due to testing and other limitations. For purposes of this rule, tank wagon sales are considered retail sales. The credit is calculated on Form IA 8864.

42.34(1) Calculating the credit.

a. Gallonage requirement.

(1) Tax years beginning on or after January 1, 2006, but prior to January 1, 2009. In order for a retail dealer to qualify for the biodiesel blended fuel tax credit for tax years beginning on or after January 1, 2006, but prior to January 1, 2009, of the total gallons of diesel fuel that the retail dealer sells and dispenses during the tax year, 50 percent or more of those gallons must be biodiesel blended fuel formulated with a minimum percentage of 2 percent by volume of biodiesel. The gallonage amounts for all motor fuel sites of a retail dealer are combined when calculating this gallonage requirement.

(2) Tax years beginning on or after January 1, 2009, but prior to January 1, 2012. For tax years beginning on or after January 1, 2009, but prior to January 1, 2012, the biodiesel blended fuel tax credit is calculated separately for each retail motor fuel site for which 50 percent or more of the total gallons of diesel fuel sold at the motor fuel site was biodiesel blended fuel formulated with a minimum percentage of 2 percent by volume of biodiesel.

(3) Tax years beginning on or after January 1, 2012. For tax years beginning on or after January 1, 2012, the requirement that 50 percent of all diesel fuel gallons sold be biodiesel gallons to be eligible for the tax credit is eliminated. A retail dealer may qualify for the biodiesel blended fuel tax credit even if the number of gallons of biodiesel blended fuel sold is less than 50 percent of the total gallons of diesel fuel sold.

b. Amount of credit.

(1) Fuel sold on or after January 1, 2006, but prior to January 1, 2012. For biodiesel blended fuel sold on or after January 1, 2006, but prior to January 1, 2012, the tax credit equals three cents multiplied by the qualifying number of biodiesel blended fuel gallons sold by the taxpayer during the tax year. Qualifying biodiesel blended fuel must be formulated with a minimum percentage of 2 percent by volume of biodiesel.

(2) Fuel sold on or after January 1, 2012, but prior to January 1, 2013. For biodiesel blended fuel sold on or after January 1, 2012, but prior to January 1, 2013, the tax credit equals the sum of two cents multiplied by the qualifying number of biodiesel blended fuel gallons sold by the taxpayer during the tax year that have a minimum percentage of 2 percent by volume of biodiesel but less than 5 percent by volume of biodiesel plus four and one-half cents multiplied by the qualifying number of biodiesel blended fuel gallons sold by the taxpayer during the tax year that have a minimum percentage of 5 percent by volume of biodiesel. In addition, the gallonage requirements described in paragraph 42.34(1) “a” do not apply to fuel sold on or after January 1, 2012.

(3) Fuel sold on or after January 1, 2013, but prior to January 1, 2018. For biodiesel blended fuel sold on or after January 1, 2013, but prior to January 1, 2018, the tax credit equals four and one-half cents multiplied by the qualifying number of biodiesel blended fuel gallons sold by the taxpayer during the tax year that have a minimum percentage of 5 percent by volume of biodiesel. Diesel fuel sold that contains less than 5 percent by volume of biodiesel does not qualify for the biodiesel blended fuel tax credit.

(4) Fuel sold on or after January 1, 2018, but prior to January 1, 2025.

1. Amount of credit. For biodiesel blended fuel sold on or after January 1, 2018, but prior to January 1, 2025, the tax credit equals the sum of three and one-half cents multiplied by the qualifying number of biodiesel blended fuel gallons sold by the taxpayer during the tax year that have a minimum percentage of 5 percent by volume of biodiesel but less than 11 percent by volume of biodiesel plus five and one-half cents multiplied by the qualifying number of biodiesel blended fuel gallons sold by the taxpayer during the tax year that have a minimum percentage of 11 percent by volume of biodiesel. Diesel fuel sold that contains less than 5 percent by volume of biodiesel does not qualify for the biodiesel blended fuel tax credit.

2. Blending errors. Where a blending error occurs and an insufficient amount of biodiesel has inadvertently been blended with petroleum-based diesel fuel so that the mixture fails to contain 11 percent by volume of biodiesel, a 1 percent tolerance applies in determining the credit amount for the blended product as described in 42.34(1)“b”(4)“2”:

- If the amount of the biodiesel erroneously blended with petroleum-based diesel is at least 10 percent of the total blended product by volume, the entire blended product qualifies for the credit amount available for biodiesel blended fuel that has a minimum percentage of 11 percent by volume of biodiesel.

- If the amount of biodiesel blended with petroleum-based diesel is at least 5 percent but less than 10 percent of the total blended product by volume, the entire blended product qualifies for the credit amount available for biodiesel blended fuel that has a minimum percentage of 5 percent by volume of biodiesel but less than 11 percent by volume of biodiesel.

- Numbered paragraph 42.34(1)“b”(4)“2” applies only if a retail dealer intends to sell and dispense biodiesel blended fuel that has a minimum percentage of 11 percent by volume of biodiesel. If a retail dealer does not intend to sell and dispense biodiesel blended fuel that has a minimum percentage of 11 percent by volume of biodiesel and the product sold and dispensed contains less than 11 percent biodiesel by volume, no error has occurred and the product does not qualify for the credit amount available for biodiesel blended fuel that has a minimum percentage of 11 percent by volume of biodiesel.

c. *Refundability.* Any credit in excess of the taxpayer’s tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

d. *Transferability.* The credit may not be transferred to any other person.

e. *Examples.*

EXAMPLE 1: A taxpayer operated four retail motor fuel sites during 2008 and sold a combined total at all four sites of 100,000 gallons of diesel fuel, of which 55,000 gallons was biodiesel blended fuel containing a minimum percentage of 2 percent by volume of biodiesel. Because 50 percent or more of the diesel fuel sold was biodiesel blended fuel, the taxpayer may claim the biodiesel blended fuel tax credit totaling \$1,650, which is 55,000 gallons multiplied by three cents.

EXAMPLE 2: A taxpayer operated two retail motor fuel sites during 2008, and each site sold 40,000 gallons of diesel fuel. One site sold 25,000 gallons of biodiesel blended fuel containing a minimum percentage of 2 percent by volume of biodiesel, and the other site sold 10,000 gallons of biodiesel blended fuel containing a minimum percentage of 2 percent by volume of biodiesel. The taxpayer would not be eligible for the biodiesel blended fuel tax credit because only 35,000 gallons of the total 80,000 gallons, or 43.75 percent of the total diesel fuel gallons sold, was biodiesel blended fuel. The 50 percent requirement is based on the aggregate number of diesel fuel gallons sold by the taxpayer, and the fact that one retail motor fuel site met the 50 percent requirement does not allow the taxpayer to claim the biodiesel blended fuel tax credit for the 2008 tax year.

EXAMPLE 3: Same facts as in example 2, except the fuel sales occurred in 2009. The taxpayer can claim a biodiesel blended fuel tax credit totaling \$750, which is 25,000 gallons multiplied by three cents, since one of the retail motor fuel sites met the 50 percent biodiesel blended fuel requirement.

EXAMPLE 4: Same facts as in example 2, except the fuel sales occurred in 2016, and all biodiesel blended fuel sold contains a minimum percentage of 5 percent by volume of biodiesel. The taxpayer can claim a biodiesel blended fuel tax credit totaling \$1,575, which is 35,000 gallons multiplied by four and one-half cents, since the 50 percent biodiesel blended fuel requirement has been eliminated.

42.34(2) Fiscal year filers. Taxpayers whose tax year is not on a calendar-year basis and whose tax year ends before December 31, 2006, may compute the tax credit on the gallons of biodiesel blended fuel sold during the period from January 1, 2006, through the end of the tax year, provided that 50 percent of all diesel fuel sold during that period was biodiesel blended fuel. Because the tax credit is repealed on January 1, 2025, a taxpayer whose tax year ends prior to December 31, 2024, may continue to claim the tax credit in the following tax year for any biodiesel blended fuel sold through December 31, 2024.

See 701—subrule 52.31(2) for examples illustrating how this subrule is applied.

42.34(3) Allocation of credit to owners of a business entity or to beneficiaries of an estate or trust. If a taxpayer claiming the biodiesel blended fuel tax credit is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement Iowa Code section 422.11P as amended by 2016 Iowa Acts, Senate File 2309.

[**ARC 8702B**, IAB 4/21/10, effective 5/26/10; **ARC 9821B**, IAB 11/2/11, effective 12/7/11; **ARC 3043C**, IAB 4/26/17, effective 5/31/17]

701—42.35(422) Soy-based transformer fluid tax credit. Effective for tax periods ending after June 30, 2006, and beginning before January 1, 2009, an electric utility may claim a soy-based transformer fluid tax credit. An electric utility, which is a public utility, city utility, or electric cooperative which furnishes electricity, may claim a credit equal to the costs incurred during the tax year for the purchase and replacement costs relating to the transition from using nonsoy-based transformer fluid to using soy-based transformer fluid.

42.35(1) Eligibility requirements for the tax credit. All of the following conditions must be met for the electric utility to qualify for the soy-based transformer fluid tax credit.

- a. The costs must be incurred after June 30, 2006, and before January 1, 2009.
- b. The costs must be incurred in the first 18 months of the transition from using nonsoy-based transformer fluid to using soy-based transformer fluid.
- c. The soy-based transformer fluid must be dielectric fluid that contains at least 98 percent soy-based products.
- d. The costs of the purchase and replacement must not exceed \$2 per gallon of soy-based transformer fluid used in the transition.
- e. The number of gallons used in the transition must not exceed 20,000 gallons per electric utility, and the total number of gallons eligible for the credit must not exceed 60,000 gallons in the aggregate.
- f. The electric utility shall not deduct for Iowa income tax purposes the costs incurred in the transition to using soy-based transformer fluid which are deductible for federal income tax purposes.

42.35(2) Applying for the tax credit. An electric utility must apply to the department for the soy-based transformer fluid tax credit. The application for the tax credit must be filed no later than 30 days after the close of the tax year for which the credit is claimed. The application must include the following information:

- a. A copy of the signed purchase agreement or other agreement to purchase soy-based transformer fluid.
- b. The number of gallons of soy-based transformer fluid purchased during the tax year, along with the cost per gallon of each purchase made during the tax year.
- c. The name, address, and tax identification number of the electric utility.
- d. The type of tax for which the credit will be claimed, and the first year in which the credit will be claimed.
- e. If the application is filed by a partnership, limited liability company, S corporation, or estate or trust requesting a credit for individual or corporation income tax, a list of the partners, members, shareholders or beneficiaries of the entity. This list shall include the name, address, tax identification

number and pro rata share of earnings from the entity for each of the partners, members, shareholders or beneficiaries.

42.35(3) *Claiming the tax credit.* After the application is reviewed, the department will issue a tax credit certificate to the electric utility. The tax credit certificate will include the taxpayer's name, address and federal identification number, the tax type for which the credit will be claimed, the amount of the credit and the tax year for which the credit may be claimed. Once the tax credit certificate is issued, the credit may be claimed only against the type of tax reflected on the certificate. If the department refuses to issue the tax credit certificate, the taxpayer shall be notified in writing; and the taxpayer will have 60 days from the date of denial to file a protest in accordance with rule 701—7.8(17A).

If the taxpayer is a partnership, limited liability company, S corporation, or estate or trust requesting a credit for individual or corporation income tax, the tax credit certificate will be issued to the partners, members, shareholders or beneficiaries based on the partner's, member's, shareholder's or beneficiary's pro rata share of earnings of the partnership, limited liability company, S corporation, or estate or trust.

Any credit in excess of the taxpayer's tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

This rule is intended to implement Iowa Code section 422.11R.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 0251C, IAB 8/8/12, effective 9/12/12]

701—42.36(16,422) Agricultural assets transfer tax credit and custom farming contract tax credit.

42.36(1) *Agricultural assets transfer tax credit.* For tax years beginning on or after January 1, 2007, but before January 1, 2013, an owner of agricultural assets that rents assets to qualified beginning farmers may claim an agricultural assets transfer tax credit for Iowa individual income tax equal to 5 percent of the rental income received by the owner for cash rental agreements and 15 percent of the rental income received by the owner for commodity share agreements. Effective for tax years beginning on or after January 1, 2013, an owner of agricultural assets that rents assets to qualified beginning farmers may claim an agricultural assets transfer tax credit for Iowa individual income tax equal to 7 percent of the rental income received by the owner for cash rental agreements and 17 percent of the rental income received by the owner for commodity share agreements.

Also effective for tax years beginning on or after January 1, 2013, if the beginning farmer is a veteran, the credit is equal to 8 percent of the rental income received by the owner for cash rental agreements, and the credit is equal to 18 percent of the rental income received by the owner for commodity share agreements for the first year that the credit is allowed. However, the taxpayer may only claim 7 percent of the rental income for cash rental agreements and 17 percent of the rental income for commodity share agreements in subsequent years if the agreement is renewed or a new agreement is executed by the same parties. The administrative rules for the agricultural assets transfer tax credit for the Iowa finance authority may be found under 265—Chapter 44.

To qualify for the tax credit, an owner of agricultural assets must enter into a lease or rental agreement with a beginning farmer for a term of at least two years, but not more than five years. Both the owner of agricultural assets and the beginning farmer must meet certain qualifications set forth by the Iowa finance authority, and the beginning farmer must be eligible to receive financial assistance under Iowa Code section 16.75.

The Iowa finance authority will issue a tax credit certificate to the owner of agricultural assets which will include the name, address and tax identification number of the owner, the amount of the credit, and the tax period for which the credit may be applied. To claim the tax credit, the owner must include the tax credit certificate with the tax return for the tax period set forth on the certificate. The tax credit certificates will be issued on a first-come, first-served basis. For fiscal years beginning on or after July 1, 2009, but before July 1, 2013, the amount of tax credit certificates issued by the Iowa agricultural development authority for the agricultural assets transfer tax credit program cannot exceed \$6 million. For fiscal years beginning on or after July 1, 2013, the amount of the tax credit certificates issued by the Iowa finance authority for the agricultural assets transfer tax credit program cannot exceed \$8 million and the amount of the credit issued to an individual taxpayer cannot exceed \$50,000. However, effective

December 31, 2017, the amount of tax credits issued by the Iowa finance authority for the agricultural assets transfer tax credit shall revert back to \$6 million.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is the earlier. However, for any agricultural assets transfer tax credits originally issued for tax years beginning on or after January 1, 2008, any credit in excess of the tax liability may be credited to the tax liability for the following ten years. The tax credit shall not be carried back to a tax year prior to the year in which the owner redeems the credit. The credit is not transferable to any other person other than the taxpayer's estate or trust upon the death of the taxpayer.

If an owner of agricultural assets is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

The lease or rental agreement may be terminated by either the owner or the beginning farmer. If the Iowa finance authority determines that the owner is not at fault for the termination, the authority will not issue a tax credit certificate for subsequent years, but any prior tax credit certificates issued will be allowed. If the Iowa finance authority determines that the owner is at fault for the termination, any prior tax credit certificates will be disallowed. The amount of tax credits previously allowed will be recaptured, and the owner will be required to repay the entire amount of tax credits previously claimed on Iowa returns.

42.36(2) Custom farming contract tax credit. Effective for tax years beginning on or after January 1, 2013, a landowner that hires a beginning farmer to custom farm agricultural land in this state may claim a custom farming contract tax credit for Iowa individual income tax. The credit is equal to 7 percent of the value of the contract. If the beginning farmer is a veteran, the credit is equal to 8 percent of the value of the contract for the first year. However, the taxpayer may only claim 7 percent of the value of the contract in subsequent years if the agreement is renewed or a new agreement is executed by the same parties. The administrative rules for the custom farming contract tax credit for the Iowa finance authority may be found under 265—Chapter 44.

To qualify for the tax credit, the taxpayer must enter into a lease or rental agreement with a beginning farmer for a term of at least two years but not more than five years. Both the taxpayer and the beginning farmer must meet certain qualifications set forth by the Iowa finance authority, and the beginning farmer must be eligible to receive financial assistance under Iowa Code section 16.75.

The Iowa finance authority will issue a tax credit certificate to the taxpayer which will include the name, address and tax identification number of the owner, the amount of the credit, and the tax period for which the credit may be applied. To claim the tax credit, the owner must include the tax credit certificate with the tax return for the tax period set forth on the certificate. For fiscal years beginning on or after July 1, 2013, the amount of tax credit certificates issued by the Iowa finance authority for the custom farming contract tax credit program cannot exceed \$4 million, and the credit certificates will be issued on a first-come, first-served basis. The amount of the credit issued to an individual taxpayer cannot exceed \$50,000. However, effective December 31, 2017, the Iowa finance authority will no longer issue custom farming contract tax credits.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following ten years or until used, whichever is the earlier. The tax credit shall not be carried back to a tax year prior to the year in which the owner redeems the credit. The credit is not transferable to any other person other than the taxpayer's estate or trust upon the death of the taxpayer.

If the party entering into the custom farming contract with the beginning farmer is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

The custom farming contract may be terminated by either the taxpayer or the beginning farmer. If the Iowa finance authority determines that the taxpayer is not at fault for the termination, the authority will not issue a tax credit certificate for subsequent years, but any prior tax credit certificates issued will

be allowed. If the Iowa finance authority determines that the taxpayer is at fault for the termination, any prior tax credit certificates will be disallowed. The amount of tax credits previously allowed will be recaptured, and the taxpayer will be required to repay the entire amount of tax credits previously claimed on Iowa returns.

This rule is intended to implement Iowa Code section 422.11M; 2014 Iowa Acts, Senate File 2328, sections 60 and 61, as amended by 2014 Iowa Acts, House File 2454; and 2014 Iowa Acts, Senate File 2328, sections 120 and 122.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1138C, IAB 10/30/13, effective 12/4/13; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.37(15,422) Film qualified expenditure tax credit. Effective for tax years beginning on or after January 1, 2007, a film qualified expenditure tax credit is available for individual income tax. The tax credit cannot exceed 25 percent of the taxpayer's qualified expenditures in a film, television, or video project registered with the film office of the Iowa department of economic development (IDED). The film office may negotiate the amount of the tax credit. The administrative rules for the film qualified expenditure tax credit for IDED may be found at 261—Chapter 36.

42.37(1) Qualified expenditures. A qualified expenditure is a payment to an Iowa resident or an Iowa-based business for the sale, rental or furnishing of tangible personal property or services directly related to the registered project. The qualified expenditures include, but are not limited to, the following:

1. Aircraft.
2. Vehicles.
3. Equipment.
4. Materials.
5. Supplies.
6. Accounting services.
7. Animals and animal care services.
8. Artistic and design services.
9. Graphics.
10. Construction.
11. Data and information services.
12. Delivery and pickup services.
13. Labor and personnel. For limitations on the amount of labor and personnel expenditures, see Iowa department of economic development 261—paragraph 36.7(2)“b.”
14. Lighting services.
15. Makeup and hairdressing services.
16. Film.
17. Music.
18. Photography.
19. Sound.
20. Video and related services.
21. Printing.
22. Research.
23. Site fees and rental.
24. Travel related to Iowa distant locations.
25. Trash removal and cleanup.
26. Wardrobe.

A detailed list of all qualified expenditures for each of these categories is available from the film office of IDED.

42.37(2) Claiming the tax credit. Upon completion of the registered project in Iowa, the taxpayer must submit, in a format approved by IDED prior to production, a listing of the qualified expenditures. Upon verification of the qualified expenditures, IDED will issue a tax credit certificate to the taxpayer. The certificate will list the taxpayer's name, address, and tax identification number; the date of project

completion; the amount of the credit; the tax period for which the credit may be applied; and the type of tax for which the credit will be applied.

If the taxpayer is a partnership, limited liability company, S corporation, or estate or trust requesting a credit for individual or corporation income tax, the tax credit certificate will be issued to the partners, members, shareholders or beneficiaries based on each partner's, member's, shareholder's or beneficiary's pro rata share of earnings of the partnership, limited liability company, S corporation, or estate or trust.

To claim the tax credit, the taxpayer must include the tax credit certificate with the tax return for the tax period set forth on the certificate. Any tax credit in excess of the tax liability may be carried forward for five years or until the tax credit is used, whichever is the earlier. The tax credit cannot be carried back to a tax year prior to the year in which the taxpayer claimed the tax credit.

42.37(3) *Transfer of the film qualified expenditure tax credit.* The film qualified expenditure tax credit may be transferred no more than two times to any person or entity.

Within 90 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department of revenue, along with a statement which contains the transferee's name, address and tax identification number and the amount of the tax credit being transferred. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department of revenue will issue a replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company, S corporation, or estate or trust claiming the credit for individual or corporation income tax, the transferee shall provide a list of the partners, members, shareholders or beneficiaries and information on how the film qualified expenditure tax credit should be divided among the partners, members, shareholders or beneficiaries. The transferee shall also provide the tax identification numbers and addresses of the partners, members, shareholders or beneficiaries. The replacement tax credit certificate must contain the same information as that on the original tax credit certificate and must have the same effective taxable year as the original tax credit certificate. The replacement tax credit certificate may reflect a different tax type than the original tax credit certificate.

The transferee may use the amount of the tax credit for any tax year for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit certificate shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit certificate shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

42.37(4) *Repeal of film qualified expenditure tax credit.* The film qualified expenditure tax credit is repealed for tax years beginning on or after January 1, 2012. However, the credit is still available for tax years beginning prior to January 1, 2012, if the contract or agreement related to a film project was entered into on or before May 25, 2012.

This rule is intended to implement 2012 Iowa Acts, House File 2337, sections 38 to 40.
[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 0398C, IAB 10/17/12, effective 11/21/12; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.38(15,422) Film investment tax credit. Effective for tax years beginning on or after January 1, 2007, a film investment tax credit is available for individual income tax. The tax credit cannot exceed 25 percent of the taxpayer's investment in a film, television, or video project registered with the film office of the Iowa department of economic development (IDED). The film office may negotiate the amount of the tax credit. The administrative rules for the film investment tax credit for IDED may be found at 261—Chapter 36.

42.38(1) *Claiming the tax credit.* Upon completion of the project in Iowa and verification of the investment in the project, IDED will issue a tax credit certificate to the taxpayer. The certificate will list the taxpayer's name, address, and tax identification number; the date of project completion; the amount of the credit; the tax period for which the credit may be applied; and the type of tax for which the credit will be applied.

If the taxpayer is a partnership, limited liability company, S corporation, or estate or trust requesting a credit for individual or corporation income tax, the tax credit certificate will be issued to the partners,

members, shareholders or beneficiaries based on each partner's, member's, shareholder's or beneficiary's pro rata share of earnings of the partnership, limited liability company, S corporation, or estate or trust.

To claim the tax credit, the taxpayer must include the tax credit certificate with the tax return for the tax period set forth on the certificate. Any tax credit in excess of the tax liability may be carried forward for five years or until the tax credit is used, whichever is the earlier. The tax credit cannot be carried back to a tax year prior to the year in which the taxpayer claimed the tax credit. In addition, a taxpayer cannot claim the film investment tax credit for qualified expenditures for which the film expenditure tax credit set forth in rule 701—42.37(15,422) is claimed.

The total of all film investment tax credits for a particular project cannot exceed 25 percent of the qualified expenditures as set forth in subrule 42.37(1) for the particular project. If the amount of investment exceeds the qualified expenditures, the tax credit will be allocated proportionately. For example, if three investors each invested \$100,000 in a project but the qualified expenditures in Iowa only totaled \$270,000, each investor would receive a tax credit based on a \$90,000 investment amount.

42.38(2) *Transfer of the film investment tax credit.* The film investment tax credit may be transferred no more than two times to any person or entity.

Within 90 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department of revenue, along with a statement which contains the transferee's name, address and tax identification number and the amount of the tax credit being transferred. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department of revenue will issue a replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company, S corporation, or estate or trust claiming the credit for individual or corporation income tax, the transferee shall provide a list of the partners, members, shareholders or beneficiaries and information on how the film investment tax credit should be divided among the partners, members, shareholders or beneficiaries. The transferee shall also provide the tax identification numbers and addresses of the partners, members, shareholders or beneficiaries. The replacement tax credit certificate must contain the same information as that on the original tax credit certificate and must have the same effective taxable year as the original tax credit certificate. The replacement tax credit certificate may reflect a different tax type than the original tax credit certificate.

The transferee may use the amount of the tax credit for any tax year for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit certificate shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit certificate shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

42.38(3) *Repeal of film investment tax credit.* The film investment tax credit is repealed for tax years beginning on or after January 1, 2012. However, the credit is still available for tax years beginning prior to January 1, 2012, if the contract or agreement related to a film project was entered into on or before May 25, 2012.

This rule is intended to implement 2012 Iowa Acts, House File 2337, sections 38 to 40.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 0398C, IAB 10/17/12, effective 11/21/12; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.39(422) *Ethanol promotion tax credit.* Effective for tax years beginning on or after January 1, 2009, a retail dealer of gasoline may claim an ethanol promotion tax credit. For purposes of this rule, tank wagon sales are considered retail sales. The ethanol promotion tax credit is computed on Form IA 137.

42.39(1) *Definitions.* The following definitions are applicable to this rule:

“*Biodiesel gallonage*” means the total number of gallons of biodiesel which the retail dealer sells from motor fuel pumps during a determination period. For example, 5,000 gallons of biodiesel blended fuel with a 2 percent by volume of biodiesel sold during a determination period results in a biodiesel gallonage of 100 (5,000 times 2%).

“*Biofuel distribution percentage*” means the sum of the retail dealer’s total ethanol gallonage plus the retail dealer’s total biodiesel gallonage expressed as a percentage of the retail dealer’s total gasoline gallonage.

“*Biofuel threshold percentage*” is dependent on the aggregate number of gallons of motor fuel sold by a retail dealer during a determination period, as set forth below:

| Determination Period | More than 200,000 Gallons Sold by Retail Dealer | 200,000 Gallons or Less Sold by Retail Dealer |
|----------------------|---|---|
| 2009 | 10% | 6% |
| 2010 | 11% | 6% |
| 2011 | 12% | 10% |
| 2012 | 13% | 11% |
| 2013 | 14% | 12% |
| 2014 | 15% | 13% |
| 2015 | 17% | 14% |
| 2016 | 19% | 15% |
| 2017 | 21% | 17% |
| 2018 | 23% | 19% |
| 2019 | 25% | 21% |
| 2020 | 25% | 25% |

“*Biofuel threshold percentage disparity*” means the positive percentage difference between the retail dealer’s biofuel threshold percentage and the retail dealer’s biofuel distribution percentage. For example, if a retail dealer that sells more than 200,000 gallons of motor fuel in 2009 has a biofuel distribution percentage of 8 percent, the biofuel threshold percentage disparity equals 2 percent (10% minus 8%).

“*Determination period*” means any 12-month period beginning on January 1 and ending on December 31.

“*Ethanol gallonage*” means the total number of gallons of ethanol which the retail dealer sells from motor fuel pumps during a determination period. For example, 10,000 gallons of ethanol blended gasoline formulated with a 10 percent by volume of ethanol sold during a determination period results in an ethanol gallonage of 1,000 (10,000 gallons times 10%).

“*Gasoline gallonage*” means the total number of gallons of gasoline sold by the retail dealer during a determination period.

42.39(2) Calculation of tax credit.

a. The tax credit is calculated by multiplying the retail dealer’s total ethanol gallonage by the tax credit rate, which is adjusted based upon the retail dealer’s biofuel threshold percentage disparity. The tax credit rate is set forth below:

| Biofuel Threshold Percentage Disparity | Tax Credit Rate per Gallon 2009-2010 | Tax Credit Rate per Gallon 2011 | Tax Credit Rate per Gallon 2012-2020 |
|--|--------------------------------------|---------------------------------|--------------------------------------|
| 0% | 6.5 cents | 8 cents | 8 cents |
| 0.01% to 2.00% | 4.5 cents | 6 cents | 6 cents |
| 2.01% to 4.00% | 2.5 cents | 2.5 cents | 4 cents |
| 4.01% or more | 0 cents | 0 cents | 0 cents |

b. For use in calculating a retail dealer’s total ethanol gallonage, the department is required to establish a schedule regarding the average amount of ethanol contained in E-85 gasoline.

c. A taxpayer may claim the ethanol promotion tax credit even if the taxpayer also claims the E-85 gasoline promotion tax credit provided in rule 701—42.33(422) or the E-15 plus gasoline promotion tax credit provided in rule 701—42.46(422) for the same tax year for the same ethanol gallons.

d. The tax credit must be calculated separately for each retail motor fuel site operated by the taxpayer for tax years beginning prior to January 1, 2011. The biofuel threshold percentage disparity of the taxpayer is computed on a statewide basis based on the total ethanol gallonage sold in Iowa. The taxpayer must determine the ethanol gallonage sold at each retail motor fuel site and multiply this ethanol gallonage by the applicable tax credit rate based on the biofuel threshold percentage disparity to calculate the ethanol promotion tax credit.

e. For tax years beginning on or after January 1, 2011, the taxpayer may elect to compute the biofuel threshold percentage disparity and the tax credit on either a site-by-site basis or on a companywide basis. The election made on the first return beginning on or after January 1, 2011, for either the site-by-site method or the companywide method is binding on the taxpayer for subsequent tax years unless the taxpayer petitions the department for a change in the method. Any petition for a change in the method should be made within a reasonable period of time prior to the due date of the return for which the change is requested. For example, if a change is requested for the tax return beginning January 1, 2012, the petition should be made by January 31, 2013, which is 90 days prior to the due date of the return.

The mere fact that a change in the method will result in a larger tax credit for subsequent years is not, of itself, sufficient grounds for changing the method for computing the credit. An example of a case for which the department may grant a change in the method is if the taxpayer has a significant change in the type of fuel sold at the taxpayer's retail sites in Iowa. For example, if a retail dealer opted to start selling E-85 gasoline at all the taxpayer's retail sites in Iowa for a subsequent tax year, the department may grant a change in the method.

If a taxpayer chooses the site-by-site method to compute the biofuel threshold percentage disparity, the gallons sold at all sites in Iowa must be considered in determining if the biofuel threshold percentage as defined in subrule 42.39(1) is based on more than 200,000 gallons or on 200,000 gallons or less. For example, if a taxpayer operates three motor fuel sites in Iowa and each site sells 80,000 gallons of motor fuel during 2011, the biofuel threshold percentage of 12 percent must be used for each retail site if the tax credit is computed on a site-by-site basis, even though each retail site sold less than 200,000 gallons of motor fuel.

f. Any tax credit in excess of the taxpayer's tax liability is refundable. In lieu of claiming a refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

42.39(3) Fiscal year filers. For taxpayers whose tax year is not on a calendar-year basis, the taxpayer may compute the ethanol promotion tax credit on the total ethanol gallonage sold during the year using the designated tax credit rates as shown in subrule 42.39(2), paragraph "a." Because the tax credit is repealed on January 1, 2021, a taxpayer whose tax year ends prior to December 31, 2020, may continue to claim the tax credit in the following tax year for the total ethanol gallonage sold through December 31, 2020. A taxpayer whose tax year is not on a calendar-year basis and that did not claim the ethanol promotion tax credit on the previous return may claim the tax credit for the current tax year for the period beginning on January 1 of the previous tax year until the last day of the previous tax year.

42.39(4) Allocation of tax credit to owners of a business entity. If a taxpayer claiming the ethanol promotion tax credit is a partnership, limited liability company, S corporation, estate, or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by the individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, estate, or trust.

42.39(5) Examples. The following noninclusive examples illustrate how this rule applies:

EXAMPLE 1. A taxpayer that is a retail dealer of gasoline operates only one motor fuel site in Iowa. The number of gallons of gasoline sold at this site in 2009 equals 100,000 gallons. This consisted of 5,000 gallons of E-85 gasoline, 80,000 gallons of E-10 (10% ethanol blended gasoline) and 15,000 gallons not containing ethanol. The average ethanol content of E-85 gasoline is assumed to be 79%. The taxpayer also sold at this site during 2009 15,000 gallons of diesel fuel, of which 5,000 gallons was B-2 (2% biodiesel). The ethanol gallonage is 11,950 (5,000 E-85 gallons times 79% equals 3,950; 80,000 E-10 gallons times 10% equals 8,000; and thus 3,950 plus 8,000 equals 11,950). The biodiesel gallonage sold is 100, or 5,000 times 2%. The sum of 11,950 and 100, or 12,050, is divided by the total gasoline

gallage of 100,000 to arrive at a biofuel distribution percentage of 12.05%. Since this percentage exceeds the biofuel threshold percentage of 6% for a retail dealer selling 200,000 gallons or less, the biofuel threshold disparity percentage is 0%. This calculation results in an ethanol promotion tax credit of 6.5 cents times 11,950, or \$776.75.

In addition, the taxpayer is entitled to claim the E-85 gasoline promotion tax credit equal to 20 cents multiplied by 5,000 gallons, or \$1,000.

EXAMPLE 2. A taxpayer that is a retail dealer of gasoline operates only one motor fuel site in Iowa. The number of gallons of gasoline sold at this site in 2010 equals 300,000 gallons which consisted of 10,000 gallons of E-85 gasoline, 230,000 gallons of E-10 (10% ethanol blended gasoline) and 60,000 gallons not containing ethanol. The average ethanol content of E-85 gasoline is assumed to be 79%. The taxpayer also sold 60,000 gallons of diesel fuel at this site during 2010, of which 25,000 gallons was B-2 (2% biodiesel). The ethanol gallonage is 30,900 (10,000 E-85 gallons times 79% equals 7,900; 230,000 E-10 gallons times 10% equals 23,000; and thus 7,900 plus 23,000 equals 30,900). The biodiesel gallonage sold is 500, or 25,000 times 2%. The sum of 30,900 and 500, or 31,400, is divided by the total gasoline gallonage of 300,000 to arrive at a biofuel distribution percentage of 10.47%. Since this is less than the biofuel threshold percentage of 11% for a retail dealer selling more than 200,000 gallons, the biofuel threshold disparity percentage is .53%. This calculation results in an ethanol promotion tax credit of 4.5 cents times 30,900, or \$1,390.50.

In addition, the taxpayer is entitled to claim the E-85 gasoline promotion tax credit equal to 20 cents multiplied by 10,000 gallons, or \$2,000.

EXAMPLE 3. A taxpayer that is a retail dealer of gasoline operates three motor fuel sites in Iowa during 2009, and each site sold 80,000 gallons of gasoline. Sites A and B each sold 70,000 gallons of E-10 (10% ethanol blended gasoline) and 10,000 gallons not containing ethanol. Site C sold 60,000 gallons of E-10, 10,000 gallons of E-85, and 10,000 gallons not containing ethanol. The average ethanol content of E-85 gasoline is assumed to be 79%. The retail dealer did not sell any diesel fuel at any of the motor fuel sites. The ethanol gallonage is 27,900, as shown below:

| | |
|----------------------------------|---------------|
| Site A – 70,000 times 10% equals | 7,000 |
| Site B – 70,000 times 10% equals | 7,000 |
| Site C – 60,000 times 10% equals | 6,000 |
| Site C – 10,000 times 79% equals | 7,900 |
| Total | <u>27,900</u> |

The ethanol gallonage of 27,900 is divided by the gasoline gallonage of 240,000 to arrive at a biofuel distribution percentage of 11.63%. Since this exceeds the biofuel threshold percentage of 10% for a retail dealer selling more than 200,000 gallons, the biofuel threshold disparity percentage is 0%. The credit is computed separately for each motor fuel site, and the ethanol promotion credit equals \$1,813.50, as shown below:

| | |
|--|-------------------|
| Site A – 7,000 times 6.5 cents equals | \$455.00 |
| Site B – 7,000 times 6.5 cents equals | \$455.00 |
| Site C – 13,900 times 6.5 cents equals | \$903.50 |
| Total | <u>\$1,813.50</u> |

Since the biofuel distribution percentage and the biofuel threshold percentage disparity are computed on a statewide basis for all gallons sold in Iowa, the 6.5 cent tax credit rate is applied to the total ethanol gallonage, even if Sites A and B did not meet the biofuel threshold percentage of 10% for 2009.

In addition, the taxpayer is entitled to claim the E-85 gasoline promotion tax credit equal to 20 cents multiplied by 10,000 gallons, or \$2,000.

EXAMPLE 4. A taxpayer that is a retail dealer of gasoline has a fiscal year ending March 31, 2011, and operates one motor fuel site in Iowa. The taxpayer sold more than 200,000 gallons of gasoline during the 2010 calendar year and expects to sell more than 200,000 gallons of gasoline during the 2011 calendar

year. The ethanol gallonage is 30,000 for the period from April 1, 2010, through December 31, 2010, and the ethanol gallonage is 8,000 for the period from January 1, 2011, through March 31, 2011. The biofuel distribution percentage is 11.5% for the period from April 1, 2010, through December 31, 2010, and the biofuel distribution percentage is 11.8% for the period from January 1, 2011, through March 31, 2011. This results in a biofuel threshold percentage disparity of 0% (11.0 minus 11.5) for the period from April 1, 2010, through December 31, 2010, and a biofuel threshold percentage disparity of .2% (12.0 minus 11.8) for the period from January 1, 2011, through March 31, 2011. The taxpayer is entitled to an ethanol promotion tax credit of \$2,310 for the fiscal year ending March 31, 2011, as shown below:

| | |
|-------------------------------|----------------|
| 30,000 times 6.5 cents equals | \$1,950 |
| 8,000 times 4.5 cents equals | 360 |
| Total | <u>\$2,310</u> |

EXAMPLE 5. A taxpayer that is a retail dealer of gasoline has a fiscal year ending April 30, 2009, and operates one motor fuel site in Iowa. The taxpayer expects to sell more than 200,000 gallons of gasoline during the 2009 calendar year. The ethanol gallonage is 50,000 gallons for the period from January 1, 2009, through April 30, 2009. The biofuel distribution percentage is 7.7% for the period from January 1, 2009, through April 30, 2009, which results in a biofuel threshold percentage disparity of 2.3% (10.0 minus 7.7). The taxpayer is entitled to claim an ethanol promotion tax credit of \$1,250 (50,000 gallons times 2.5 cents) on the taxpayer's Iowa income tax return for the period ending April 30, 2009.

In lieu of claiming the credit on the return for the period ending April 30, 2009, the taxpayer may claim the ethanol promotion tax credit on the tax return for the period ending April 30, 2010, including the ethanol gallonage for the period from January 1, 2009, through April 30, 2010. In this case, the taxpayer will compute the biofuel distribution percentage for the period from January 1, 2009, through December 31, 2009, to determine the proper tax credit rate to be applied to the ethanol gallonage for the period from January 1, 2009, through December 31, 2009.

EXAMPLE 6. Assume the same facts as Example 3, except that the gallons were sold in 2011. The taxpayer chose the companywide method to compute the biofuel threshold percentage disparity and the tax credit. The biofuel distribution percentage is 11.63%, and since the biofuel threshold percentage is 12% for retailers selling more than 200,000 gallons of motor fuel, the biofuel threshold percentage disparity is 0.37%. This results in an ethanol promotion tax credit on a companywide basis of 6 cents multiplied by the ethanol gallonage of 27,900 or \$1,674.

EXAMPLE 7. Assume the same facts as Example 3, except that the gallons were sold in 2011. The taxpayer chose the site-by-site method to compute the biofuel threshold percentage disparity and the tax credit. The biofuel threshold percentage is still 12% since the retailer sold more than 200,000 gallons of motor fuel at all sites in Iowa. The biofuel distribution percentage for Site A and Site B is 7,000 divided by 80,000, or 8.75%. The biofuel threshold percentage disparity for Site A and Site B is 3.25%, or 12% less than 8.75%. The biofuel distribution percentage for Site C is 13,900 divided by 80,000, or 17.38%. The biofuel threshold percentage disparity for Site C is 0% since the biofuel distribution percentage exceeds the biofuel threshold percentage. This results in an ethanol promotion tax credit on a site-by-site basis of \$1,462, as shown below:

| | |
|---------------------------------------|----------------|
| Site A – 7,000 times 2.5 cents equals | \$175 |
| Site B – 7,000 times 2.5 cents equals | \$175 |
| Site C – 13,900 times 8 cents equals | <u>\$1,112</u> |
| Total | \$1,462 |

This rule is intended to implement Iowa Code section 422.11N as amended by 2011 Iowa Acts, Senate File 531.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9821B, IAB 11/2/11, effective 12/7/11]

701—42.40(422) Charitable conservation contribution tax credit. Effective for tax years beginning on or after January 1, 2008, a charitable conservation contribution tax credit is available for individual income tax which is equal to 50 percent of the fair market value of a qualified real property interest located in Iowa that is conveyed as an unconditional charitable donation in perpetuity by a taxpayer to a qualified organization exclusively for conservation purposes.

42.40(1) Definitions. The following definitions are applicable to this rule:

“*Conservation purpose*” means the same as defined in Section 170(h)(4) of the Internal Revenue Code, with the exception that a conveyance of land for open space for the purpose of fulfilling density requirements to obtain subdivision or building permits is not considered a conveyance for a conservation purpose.

“*Qualified organization*” means the same as defined in Section 170(h)(3) of the Internal Revenue Code.

“*Qualified real property interest*” means the same as defined in Section 170(h)(2) of the Internal Revenue Code. Conservation easements and bargain sales are examples of a qualified real property interest.

42.40(2) Computation of the credit. The credit equals 50 percent of the fair market value of the qualified real property interest. There are numerous federal revenue regulations, rulings, court cases and other provisions relating to the determination of the value of a qualified real property interest, and these are equally applicable in determining the amount of the charitable conservation contribution tax credit.

The maximum amount of the tax credit is \$100,000. The amount of the contribution for which the tax credit is claimed shall not be claimed as an itemized deduction for charitable contributions for Iowa income tax purposes.

42.40(3) Claiming the tax credit. The tax credit is claimed on Form IA 148, Tax Credits Schedule. The taxpayer must include a copy of federal Form 8283, Noncash Charitable Contributions, which reflects the calculation of the fair market value of the real property interest, with the Iowa return for the year in which the contribution is made. If a qualified appraisal of the property or other relevant information is required to be included with federal Form 8283 for federal tax purposes, the appraisal and other relevant information must also be included with the Iowa return.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following 20 years or until used, whichever is the earlier.

If the taxpayer claiming the credit is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual’s pro rata share of the individual’s earnings of the partnership, limited liability company, S corporation, or estate or trust.

42.40(4) Examples. The following noninclusive examples illustrate how this rule applies:

EXAMPLE 1: A taxpayer conveys a real property interest with a fair market value of \$150,000 to a qualified organization during 2008. The tax credit is equal to \$75,000, or 50 percent of the \$150,000 fair market value of the real property. The taxpayer cannot claim the \$150,000 as an itemized deduction for charitable contributions on the Iowa individual income tax return for 2008.

EXAMPLE 2: A taxpayer conveys a real property interest with a fair market value of \$500,000 to a qualified organization during 2009. The tax credit is limited to \$100,000, which equates to \$200,000 of the contribution being eligible for the tax credit. The remaining amount of \$300,000 (\$500,000 less \$200,000) can be claimed as an itemized deduction for charitable contributions on the Iowa individual income tax return for 2009.

This rule is intended to implement Iowa Code section 422.11W.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.41(15,422) Redevelopment tax credit. The economic development authority is authorized by the general assembly and the governor to oversee the implementation and administration of the redevelopment tax credit program. Effective for tax years beginning on or after July 1, 2009, a taxpayer whose project has been approved by the Iowa brownfield redevelopment advisory council and the economic development authority may claim a redevelopment tax credit once the taxpayer has been

issued a tax credit certificate for the project by the economic development authority. The credit is based on the taxpayer's qualifying investment in a brownfield or grayfield site. The administrative rules for the economic development authority's administration of this program, including definitions of brownfield and grayfield sites, may be found in rules 261—65.11(15) and 261—65.12(15).

42.41(1) Eligibility for the credit. The economic development authority is responsible for developing a system for registration and authorization of projects receiving redevelopment tax credits. For more information, see Iowa Administrative Code 261—Chapter 65.

42.41(2) Amount of the credit.

a. Maximum credit total. For the fiscal year beginning July 1, 2009, the maximum amount of tax credits allowed is \$1 million, and the amount of credit authorized for any one redevelopment project cannot exceed \$100,000. For the fiscal year beginning July 1, 2011, the maximum amount of tax credit allowed cannot exceed \$5 million, and the amount of credit authorized for any one redevelopment project cannot exceed \$500,000. For the fiscal year beginning July 1, 2012, the maximum amount of tax credits allowed cannot exceed \$10 million, and the amount of credit authorized for any one redevelopment project cannot exceed \$1 million. For the fiscal year beginning July 1, 2013, and for each subsequent fiscal year, the maximum amount of tax credits issued by the authority shall be an amount determined by the economic development authority board but not in excess of the amount established pursuant to Iowa Code section 15.119.

b. Maximum credit per project. The maximum amount of a tax credit for a qualifying investment in any one qualifying redevelopment project shall not exceed 10 percent of the maximum amount of tax credits available in any one fiscal year pursuant to paragraph 42.41(2)“a.”

c. Percentage computation. The amount of the tax credit shall equal one of the following:

- (1) Twelve percent of the taxpayer's qualifying investment in a grayfield site.
- (2) Fifteen percent of the taxpayer's qualifying investment in a grayfield site if the qualifying redevelopment project meets the requirements of green development as defined in rule 261—65.2(15).
- (3) Twenty-four percent of the taxpayer's qualifying investment in a brownfield site.
- (4) Thirty percent of the taxpayer's qualifying investment in a brownfield site if the qualifying redevelopment project meets the requirements of green development as defined in rule 261—65.2(15).

42.41(3) Claiming the credit.

a. Certificate issuance. Upon completion of the project, the economic development authority will issue a tax credit certificate to the taxpayer. The tax credit certificate will include the taxpayer's name, address and federal identification number, the tax type for which the credit will be claimed, the amount of the credit, the tax year for which the credit may be claimed and the tax credit certificate number. In addition, the tax credit certificate will include a place for the name and tax identification number of a transferee and the amount of the tax credit being transferred, as provided in subrule 42.41(4). To claim the tax credit, the taxpayer must include the tax credit certificate with the tax return for the tax period set forth on the certificate.

b. Pro rata share. If a taxpayer claiming the tax credit is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

c. Carryforward. Except as provided in paragraph 42.41(3)“d,” any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is the earlier. The tax credit shall not be carried back to a tax year prior to the year in which the taxpayer redeems the credit.

d. Refundability. A tax credit in excess of the taxpayer's liability for the tax year is refundable if all of the conditions of economic development authority 261—paragraph 65.11(4)“b” are met.

42.41(4) Transfer of the credit. The redevelopment tax credit can be transferred to any person or entity. However, a certificate indicating that the credit is refundable is only transferrable to the extent permitted by economic development authority 261—paragraph 65.11(4)“b.”

a. Submission of transferred tax credit certificate to the department—information required. Within 90 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department of revenue, along with a statement which contains the transferee's name, address and tax identification number and the amount of the tax credit being transferred, the amount of all consideration provided in exchange for the tax credit, and the names of recipients of any consideration provided in exchange for the tax credit. If a payment of money was any part of the consideration provided in exchange for the tax credit, the transferee shall list the amount of the payment of money in its statement to the department of revenue. If any part of the consideration provided in exchange for the tax credit included nonmonetary consideration, including but not limited to any promise, representation, performance, discharge of debt or nonmonetary rights or property, the transferee shall describe the nature of nonmonetary consideration and disclose any value the transferor and transferee assigned to the nonmonetary consideration. The transferee must indicate on its statement to the department of revenue if no consideration was provided in exchange for the tax credit. If the transferee is a partnership, limited liability company, S corporation, or estate or trust claiming the credit for individual or corporation income tax, the transferee shall provide a list of the partners, members, shareholders or beneficiaries and information on how the redevelopment tax credit should be divided among the partners, members, shareholders or beneficiaries. The transferee shall also provide the tax identification numbers and addresses of the partners, members, shareholders or beneficiaries.

b. Issuance of replacement certificate by the department. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department of revenue will issue a replacement tax credit certificate to the transferee.

c. Claiming the transferred tax credit. The replacement tax credit certificate must contain the same information as that on the original tax credit certificate and must have the same effective taxable year as the original tax credit certificate. The replacement tax credit certificate may reflect a different tax type than the original tax credit certificate. The transferee may use the amount of the tax credit for any tax year for which the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit certificate shall not be included in Iowa taxable income for individual income tax, corporation income tax, or franchise tax purposes. Any consideration paid for the transfer of the tax credit certificate shall not be deducted from Iowa taxable income for individual income tax, corporation income tax, or franchise tax purposes.

42.41(5) Basis reduction of the redevelopment property. The increase in the basis of the redevelopment property that would otherwise result from the qualified redevelopment costs shall be reduced by the amount of the redevelopment tax credit. For example, if a qualifying investment in a grayfield site totaled \$100,000 for which a \$12,000 redevelopment tax credit was issued, the increase in the basis of the property would total \$88,000 for Iowa tax purposes (\$100,000 less \$12,000).

This rule is intended to implement Iowa Code sections 15.293A, 422.11V and 15.119.
[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9876B, IAB 11/30/11, effective 1/4/12; ARC 1102C, IAB 10/16/13, effective 11/20/13; ARC 1949C, IAB 4/1/15, effective 5/6/15]

701—42.42(15) High quality jobs program. Effective for tax periods beginning on or after July 1, 2009, a business which qualifies under the high quality jobs program is eligible to receive tax credits. The high quality jobs program replaces the high quality job creation program. An eligible business under the high quality jobs program must be approved by the Iowa department of economic development and meet the qualifications of Iowa Code section 15.329. The tax credits available under the high quality jobs program are based upon the number of jobs created or retained that pay a qualifying wage threshold and the amount of qualifying investment. The administrative rules for the high quality jobs program for the Iowa department of economic development may be found at 261—Chapter 68.

42.42(1) Research activities credit. An eligible business approved under the high quality jobs program is eligible for an additional research activities credit as described in 701—subrule 52.7(4) for awards issued by the Iowa department of economic development prior to July 1, 2010. The eligible business is eligible for the research activities credit as described in 701—subrule 52.7(6) for awards issued by the Iowa department of economic development on or after July 1, 2010.

Research activities allowable for the Iowa research activities credit include expenses related to the development and deployment of innovative renewable energy generation components manufactured or assembled in Iowa; such expenses related to the development and deployment of innovative renewable energy generation components are not eligible for the federal credit for increasing research activities. For purposes of this subrule, innovative renewable energy generation components do not include components with more than 200 megawatts in installed effective nameplate generating capacity. The research activities credit related to renewable energy generation components under the high quality jobs program and the enterprise zone program shall not exceed \$2 million for the fiscal year ending June 30, 2010, and \$1 million for the fiscal year ending June 30, 2011.

These expenses related to the development and deployment of innovative renewable energy generation components are applicable only to the additional research activities credit set forth in this subrule and in 701—subrule 52.7(5) for businesses in enterprise zones, and are not applicable to the research activities credit set forth in subrule 42.11(3), paragraphs “a” and “b.”

42.42(2) *Investment tax credit.* An eligible business can claim an investment tax credit equal to a percentage of the new investment directly related to new jobs created or retained by the location or expansion of an eligible business. The percentage is equal to the amount provided in Iowa department of economic development 261—subrule 68.4(7).

The determination of the new investment eligible for the investment tax credit, the eligibility of a refundable investment tax credit for value-added agricultural product or biotechnology-related projects and the repayment of investment tax credits for the high quality jobs program is the same as set forth in subrule 42.29(2) for the high quality job creation program.

42.42(3) *Repayment of benefits.* If an eligible business fails to maintain the requirements of the high quality jobs program, the taxpayer may be required to repay all or a portion of the tax incentives taken on Iowa returns. Irrespective of the fact that the statute of limitations to assess the taxpayer for repayment of the tax credits may have expired, the department may proceed to collect the tax incentives forfeited by failure of the eligible business to maintain the requirements of the high quality jobs program because the repayment is a recovery of an incentive, rather than an adjustment to the taxpayer’s tax liability. Details on the calculation of the repayment can be found in 261—subrule 187.5(4) of the administrative rules of the economic development authority. If the business is a partnership, limited liability company, S corporation, estate or trust where the income of the taxpayer is taxed to the individual owner(s) of the business, the department may proceed to collect the tax incentives against the partners, members, shareholders or beneficiaries to whom the tax incentives were passed through. See Decision of the Administrative Law Judge in *Damien & Colette Trebilcock, et al.*, Docket No. 11DORF 042-044, June 11, 2012.

This rule is intended to implement Iowa Code chapter 15.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.43(16,422) Disaster recovery housing project tax credit. For tax years beginning on or after January 1, 2011, but before January 1, 2015, a disaster recovery housing project tax credit is available for individual income tax. The credit is equal to 75 percent of the taxpayer’s qualifying investment in a disaster recovery housing project, and is administered by the Iowa finance authority. Qualifying investments are costs incurred on or after May 12, 2009, and prior to July 1, 2010, related to a disaster recovery housing project. Eligible properties must have applied for and received an allocation of federal low-income housing tax credits under Section 42 of the Internal Revenue Code to be eligible for the tax credit. The tax credit is repealed effective January 1, 2015.

42.43(1) *Issuance of tax credit certificates.* Upon completion of the project and verification of the amount of investment made in the disaster recovery housing project, the Iowa finance authority will issue a tax credit certificate to the taxpayer. The tax credit certificate shall include the taxpayer’s name, address, tax identification number, amount of credit, and the tax year for which the credit may be claimed. The tax credit certificates will be issued on a first-come, first-served basis. The tax credit cannot be transferred to any person or entity.

42.43(2) Limitation of tax credits. The tax credit shall not exceed 75 percent of the taxpayer's qualifying investment in a disaster recovery housing project. The maximum amount of tax credits issued by the Iowa finance authority shall not exceed \$3 million in each of the five consecutive years beginning in the 2011 calendar year. A tax credit certificate shall be issued by the Iowa finance authority for each year that the credit can be claimed.

42.43(3) Claiming the tax credit. The amount of the tax credit earned by the taxpayer will be divided by five and an amount equal thereto will be claimed on the Iowa individual income tax return commencing with the tax year beginning on or after January 1, 2011. A taxpayer is not entitled to a refund of the excess tax for any tax credit in excess of the tax liability, and also is not entitled to carry forward any excess credit to a subsequent tax year.

If the taxpayer is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

The increase in the basis of the property that would otherwise result from the disaster recovery housing investment shall be reduced by the amount of the tax credit allowed.

EXAMPLE: An individual whose tax year ends on December 31 incurs \$100,000 of costs related to an eligible disaster recovery housing project. The taxpayer receives a tax credit of \$75,000, and \$15,000 of credit can be claimed on each Iowa individual income tax return for the periods ending December 31, 2011, through December 31, 2015. If the tax liability for the individual for the period ending December 31, 2011, is \$10,000, the credit is limited to \$10,000, and the remaining \$5,000 credit cannot be used. If the tax liability for the individual for the period ending December 31, 2012, is \$25,000, the credit is limited to \$15,000, and the remaining \$5,000 credit from 2011 cannot be used to reduce the tax for 2012.

42.43(4) Potential recapture of tax credits. If the taxpayer fails to comply with the eligibility requirements of the project or violates local zoning and construction ordinances, the Iowa finance authority can void the tax credit and the department of revenue shall seek recovery of the value of any tax credit claimed on an individual income tax return.

This rule is intended to implement Iowa Code sections 16.211, 16.212 and 422.11X as amended by 2014 Iowa Acts, Senate File 2328.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.44(422) Deduction of credits. The credits against computed tax set forth in Iowa Code sections 422.5, 422.8, 422.10 through 422.12C, and 422.110 shall be claimed in the following sequence:

1. Personal exemption credit.
2. Tuition and textbook credit.
3. Volunteer fire fighter, volunteer emergency medical services personnel and reserve peace officer tax credit.
4. Nonresident and part-year resident credit.
5. Franchise tax credit.
6. S corporation apportionment credit.
7. School tuition organization tax credit.
8. Venture capital tax credits (excluding redeemed Iowa fund of funds tax credit).
9. Endow Iowa tax credit.
10. Film qualified expenditure tax credit.
11. Film investment tax credit.
12. Redevelopment tax credit.
13. From farm to food donation tax credit.
14. Workforce housing tax credit.
15. Investment tax credit.
16. Wind energy production tax credit.
17. Renewable energy tax credit.
18. Redeemed Iowa fund of funds tax credit.

19. New jobs tax credit.
20. Economic development region revolving fund tax credit.
21. Agricultural assets transfer tax credit.
22. Custom farming contract tax credit.
23. Geothermal heat pump tax credit.
24. Solar energy system tax credit.
25. Charitable conservation contribution tax credit.
26. Alternative minimum tax credit.
27. Historic preservation and cultural and entertainment district tax credit.
28. Ethanol promotion tax credit.
29. Research activities credit.
30. Out-of-state tax credit.
31. Child and dependent care tax credit or early childhood development tax credit.
32. Motor fuel tax credit.
33. Claim of right credit (if elected in accordance with rule 701—38.18(422)).
34. Wage-benefits tax credit.
35. Adoption tax credit.
36. E-85 gasoline promotion tax credit.
37. Biodiesel blended fuel tax credit.
38. E-15 plus gasoline promotion tax credit.
39. Earned income tax credit.
40. Iowa taxpayers trust fund tax credit.
41. Estimated payments, payment with vouchers, and withholding tax.

This rule is intended to implement Iowa Code sections 422.5, 422.8, 422.10, 422.11, 422.11A, 422.11B, 422.11D, 422.11E, 422.11F, 422.11H, 422.11I, 422.11J, 422.11L, 422.11M, 422.11N, 422.11O, 422.11P, 422.11Q, 422.11R, 422.11S, 422.11V, 422.11W, 422.11Y, 422.11Z, 422.12, 422.12B, 422.12C and 422.110 and 2014 Iowa Acts, House Files 2448 and 2468.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9876B, IAB 11/30/11, effective 1/4/12; ARC 0398C, IAB 10/17/12, effective 11/21/12; ARC 1303C, IAB 2/5/14, effective 3/12/14; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.45(15) Aggregate tax credit limit for certain economic development programs. Effective for the fiscal year beginning July 1, 2009, awards made under certain economic development programs cannot exceed \$185 million during a fiscal year. Effective for fiscal years beginning on or after July 1, 2010, but beginning before July 1, 2012, awards made under these economic development programs cannot exceed \$120 million during a fiscal year. Effective for fiscal years beginning on or after July 1, 2012, awards made under these economic development programs cannot exceed \$170 million. For fiscal years beginning on or after July 1, 2010, but beginning before July 1, 2014, these programs include the assistive device tax credit program, the enterprise zone program, the housing enterprise zone program, the high quality jobs program, the redevelopment tax credit program, tax credits for investments in qualifying businesses and community-based seed capital funds, and the innovation fund tax credit program. For fiscal years beginning on or after July 1, 2014, these programs include the assistive device tax credit program, the workforce housing tax incentives program, the high quality jobs program, the redevelopment tax credit program, tax credits for investments in qualifying businesses and community-based seed capital funds, and the innovation fund tax credit program. The administrative rules for the aggregate tax credit limit for the economic development authority may be found at 261—Chapter 76.

This rule is intended to implement Iowa Code section 15.119 as amended by 2014 Iowa Acts, House File 2448.

[ARC 8702B, IAB 4/21/10, effective 5/26/10; ARC 9104B, IAB 9/22/10, effective 10/27/10; ARC 1102C, IAB 10/16/13, effective 11/20/13; ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.46(422) E-15 plus gasoline promotion tax credit. Effective for eligible gallons sold on or after July 1, 2011, a retail dealer of gasoline may claim an E-15 plus gasoline promotion tax credit. “E-15

plus gasoline” means ethanol blended gasoline formulated with a minimum percentage of between 15 percent and 69 percent of volume of ethanol, if the formulation meets the standards provided in Iowa Code section 214A.2. For purposes of this rule, tank wagon sales are considered retail sales. The credit is calculated on Form IA 138.

42.46(1) Calculating the credit.

a. Amount of credit. The tax credit is calculated by multiplying the total number of E-15 plus gallons sold by the retail dealer during the tax year by the following designated rates:

| | |
|---|----------|
| Gallons sold from July 1, 2011, through December 31, 2013 | 3 cents |
| Gallons sold from January 1 through May 31 and from September 16 through December 31 for the 2014-2024 calendar years | 3 cents |
| Gallons sold from June 1 through September 15 for the 2014-2024 calendar years | 10 cents |

b. Claiming the credit with other credits. A taxpayer may claim the E-15 plus gasoline promotion tax credit even if the taxpayer also claims the ethanol promotion tax credit provided in rule 701—42.39(422) for gallons sold on or after January 1, 2011, but prior to January 1, 2021, for the same tax year for the same ethanol gallons.

c. Refundability. Any credit in excess of the taxpayer’s tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

d. Transferability. The credit may not be transferred to any other person.

42.46(2) Fiscal year filers. For taxpayers whose tax year is not on a calendar-year basis, the taxpayer may compute the tax credit on the gallons of E-15 plus gasoline sold during the year using the designated rates as shown above. Because the tax credit is repealed on January 1, 2025, a taxpayer whose tax year ends prior to December 31, 2024, may continue to claim the tax credit in the following tax year for any E-15 plus gallons sold through December 31, 2024. For a retail dealer whose tax year is not on a calendar-year basis and who did not claim the E-15 plus credit on the previous return, the dealer may claim the credit for the current tax year for gallons sold for the period beginning on July 1 of the previous tax year until the last day of the previous tax year. However, for taxpayers whose fiscal year ends prior to December 31, 2011, the dealer must claim the credit for the current tax year for gallons sold for the period beginning on July 1 of the previous tax year until the last day of the previous tax year.

EXAMPLE 1: A taxpayer who is a retail dealer of gasoline has a fiscal year ending October 31, 2011. The taxpayer sold 2,000 gallons of E-15 plus gasoline for the period from July 1, 2011, through October 31, 2011, and sold 7,000 gallons of E-15 plus gasoline for the period from November 1, 2011, through October 31, 2012. The taxpayer is entitled to a total E-15 plus gasoline promotion tax credit of \$270 for the fiscal year ending October 31, 2012, which consists of a \$60 credit (2,000 gallons multiplied by 3 cents) for the period from July 1, 2011, through October 31, 2011, and a credit of \$210 (7,000 gallons multiplied by 3 cents) for the period from November 1, 2011, through October 31, 2012.

EXAMPLE 2: A taxpayer who is a retail dealer of gasoline has a fiscal year ending April 30, 2012. The taxpayer sold 4,000 gallons of E-15 plus gasoline between July 1, 2011, and April 30, 2012. The taxpayer sold 9,000 gallons of E-15 plus gasoline between May 1, 2012, and April 30, 2013. The taxpayer is entitled to claim an E-15 plus gasoline promotion tax credit of \$120 (4,000 gallons multiplied by 3 cents) for the fiscal year ending April 30, 2012. In lieu of claiming the credit on the return for the period ending April 30, 2012, the taxpayer can claim the E-15 plus gasoline promotion tax credit on the tax return for the period ending April 30, 2013, for all E-15 plus gasoline gallons sold for the period from July 1, 2011, through April 30, 2013.

EXAMPLE 3: A taxpayer who is a retail dealer of gasoline has a fiscal year ending February 28, 2025. The taxpayer sold 20,000 total gallons of E-15 plus gasoline for the entire period from March 1, 2024, through February 28, 2025. For the period from March 1 through May 31, 2024, the taxpayer sold 4,000 gallons of E-15 plus gasoline, which entitles the taxpayer to a credit of \$120 (4,000 gallons multiplied by 3 cents). For the period from June 1 through September 15, 2024, the taxpayer sold 6,000 gallons of E-15

plus gasoline, which entitles the taxpayer to a credit of \$600 (6,000 gallons multiplied by 10 cents). For the period from September 16 through December 31, 2024, the taxpayer sold 6,000 gallons of E-15 plus gasoline, which entitles the taxpayer to a credit of \$180 (6,000 gallons multiplied by 3 cents). For the period from January 1 through February 28, 2025, the taxpayer sold 4,000 gallons of E-15 plus gasoline, which occurred after expiration of the credit. The taxpayer is entitled to claim a total E-15 plus gasoline promotion tax credit of \$900 (\$120 plus \$600 plus \$180) on the taxpayer's Iowa income tax return for the period ending February 28, 2025.

42.46(3) *Allocation of credit to owners of a business entity or to beneficiaries of an estate or trust.* If a taxpayer claiming the E-15 plus gasoline promotion tax credit is a partnership, limited liability company, S corporation, or an estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement Iowa Code section 422.11Y as amended by 2016 Iowa Acts, Senate File 2309.

[ARC 9821B, IAB 11/2/11, effective 12/7/11; ARC 1665C, IAB 10/15/14, effective 11/19/14; ARC 3043C, IAB 4/26/17, effective 5/31/17]

701—42.47(422) Geothermal tax credits. There are two distinct Iowa geothermal heat pump tax credits. Each Iowa credit is described in detail below. The Iowa credit described in subrule 42.47(1) is only available for years in which the federal credit provided in Section 25D(a)(5) of the Internal Revenue Code is also available. The Iowa credit described in subrule 42.47(2) is only available for years in which the federal credit provided in Section 25D(a)(5) of the Internal Revenue Code is not available.

42.47(1) *Geothermal heat pump tax credit for years in which the federal credit is available.*

a. Availability of the credit. For tax years beginning on or after January 1, 2012, in which the federal residential energy efficient property tax credit for geothermal heat pumps provided in Section 25D(a)(5) of the Internal Revenue Code is available, an Iowa geothermal heat pump tax credit, as described in this subrule, is also available for residential property located in Iowa.

b. Eligibility for the credit. To be eligible for the credit described in this subrule, all of the following requirements must be met:

(1) The geothermal heat pump must be eligible for the federal residential energy efficient property tax credit provided in Section 25D(a)(5) of the Internal Revenue Code.

(2) The taxpayer must claim the federal residential energy efficient property tax credit.

(3) The geothermal heat pump must be installed on or after January 1, 2012, to qualify for the Iowa credit. If the taxpayer installed a geothermal heat pump and initially reported the federal tax credit for a tax year beginning prior to January 1, 2012, no Iowa credit will be allowed.

EXAMPLE: A taxpayer reported a \$6,000 geothermal tax credit on the 2011 federal return due to an installation that was completed in 2011. The taxpayer applied \$2,000 of the credit on the taxpayer's 2011 federal return since the federal tax liability was \$2,000. The remaining \$4,000 of federal credit was applied on the 2012 federal return. No credit will be allowed on the 2012 Iowa return since the installation was completed before January 1, 2012.

c. Calculation of the credit. The credit described in this subrule is equal to 20 percent of the federal residential energy efficient property tax credit allowed for geothermal heat pumps provided in Section 25D(a)(5) of the Internal Revenue Code. As of the publication date of the Notice proposing to amend these rules, October 12, 2016, the federal residential energy efficient tax credit for geothermal heat pumps is allowed for installations that are completed on or before December 31, 2016. Therefore, the corresponding Iowa tax credit will be available for the 2012 to 2016 tax years. If the federal residential energy efficient property tax credit for geothermal heat pumps is extended into additional tax years, absent action by the Iowa legislature to repeal the Iowa credit, the Iowa credit described in this subrule will continue to be available for each year in which the federal residential energy efficient property tax credit for geothermal heat pumps is available.

d. Claiming the tax credit. The geothermal heat pump tax credit must be claimed on Form IA 148, Tax Credit Schedule. The taxpayer must include a valid copy of the taxpayer's federal Form 5695, Residential Energy Credits, with the Iowa tax return for the tax year in which the geothermal heat pump was installed claiming the geothermal heat pump credit described in this subrule.

e. Refundability. Any credit in excess of the taxpayer's tax liability is nonrefundable.

f. Carryforward. Any tax credit in excess of the taxpayer's tax liability for the tax year may be credited to the taxpayer's tax liability for the following ten years or until depleted, whichever is earlier.

g. Transferability. The credit may not be transferred to any other person.

42.47(2) Geothermal tax credit for years in which the federal credit is not available.

a. Availability of the credit. For tax years beginning on or after January 1, 2017, in which the federal residential energy efficient tax credit for geothermal heat pumps is not available, an Iowa geothermal tax credit is available for certain geothermal heat pump property installed in this state.

b. Definitions.

"*Qualified geothermal heat pump property*" means any equipment that meets the requirements of the federal Energy Star Program in effect at the time that the expenditure for such equipment is made and uses the ground or groundwater as either:

1. A thermal energy source to heat the dwelling unit of the taxpayer, or
2. A thermal energy sink to cool the dwelling unit of the taxpayer.

"*Qualified geothermal heat pump property expenditure*" means an expenditure for qualified geothermal heat pump property installed on or in connection with a dwelling unit that is:

1. Located in Iowa, and
2. Used as a residence by the taxpayer.

c. Eligibility for the credit. To be eligible for the credit described in this subrule, the qualified expenditures must be incurred:

(1) To install qualified geothermal heat pump property at a location in Iowa that is used as a residence by the taxpayer, and

(2) During the tax year for which the credit is claimed. Qualified geothermal heat pump property expenditures are deemed to have been made on the date the installation is complete. In the case of new construction or reconstruction, the expenditures are deemed to have been made on the date the taxpayer first began to use the structure as the taxpayer's residence.

d. Calculation of the credit. The credit described in this subrule is equal to 10 percent of the qualified geothermal heat pump property expenditures made by the taxpayer during the tax year. This credit is not available during any year in which the federal credit may be claimed, and no expenditure used to calculate the federal residential energy efficient property tax credit may be used to calculate the amount of the Iowa geothermal tax credit described in this subrule. For information on an Iowa tax credit that is available for years in which the federal residential energy efficient property tax credit for geothermal heat pump property is also available, see subrule 42.47(1).

e. Multiple housing cooperatives and horizontal property regimes. In the case of a taxpayer whose dwelling unit is part of a multiple housing cooperative organized under Iowa Code chapter 499A or a horizontal property regime under Iowa Code chapter 499B, the taxpayer shall be treated as having made the taxpayer's proportionate share of any qualified geothermal heat pump property expenditures made by the cooperative or the regime.

f. Claiming the credit. The geothermal credit described in this subrule must be claimed on Form IA 148, Tax Credit Schedule, and included with the tax return for the tax year in which the expenditures are deemed to have been made. In order to claim this credit, a taxpayer must also complete the form provided by the department to substantiate eligibility for the tax credit claimed and include any other information the department may require.

g. Refundability. Any credit in excess of the taxpayer's tax liability is nonrefundable.

h. Carryforward. Any tax credit in excess of the taxpayer's tax liability for the tax year may be credited to the taxpayer's tax liability for the following ten years or until depleted, whichever is earlier.

i. Transferability. The credit may not be transferred to any other person.

This rule is intended to implement Iowa Code section 422.111 and 2016 Iowa Acts, House File 2468. [ARC 0361C, IAB 10/3/12, effective 11/7/12; ARC 1744C, IAB 11/26/14, effective 12/31/14; ARC 2833C, IAB 12/7/16, effective 1/11/17]

701—42.48(422) Solar energy system tax credit. For tax years beginning on or after January 1, 2012, a solar energy system tax credit is available for both residential property and business property located in Iowa. The solar energy system must be installed on or after January 1, 2012, to be eligible for the credit.

42.48(1) Property eligible for the tax credit. The following property located in Iowa is eligible for the tax credit:

a. Qualified solar water heating property described in Section 25D(d)(1) of the Internal Revenue Code.

b. Qualified solar energy electric property described in Section 25D(d)(2) of the Internal Revenue Code.

c. Equipment which uses solar energy to generate electricity, to heat or cool (or to provide hot water for use in) a structure, or to provide solar process heat (excepting property used to generate energy for the purposes of heating a swimming pool) and which is eligible for the federal energy credit as described in Section 48(a)(3)(A)(i) of the Internal Revenue Code.

d. Equipment which uses solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight and which is eligible for the federal energy credit as described in Section 48(a)(3)(A)(ii) of the Internal Revenue Code.

42.48(2) Relationship between the Iowa and federal credits. As stated in subrules 42.48(3) to 42.48(5) below, the Iowa credit is a percentage of the applicable federal credit. Taxpayers who apply for the Iowa credit must also claim the corresponding federal credit. Availability of the Iowa credit for a specific type of installation in a given year is dependent upon availability of the federal credit for that type of installation. The Iowa credit is coupled with the Internal Revenue Code as amended to and including January 1, 2016. See Iowa Code section 422.11L(6); see also Public Law No. 114-113, Div. P, Title III, §§ 302, 303, 304, and Div. Q, Title I, § 187.

42.48(3) Calculation of credit for systems installed during tax years beginning on or after January 1, 2012, but before January 1, 2014. The credit is equal to the sum of the following federal tax credits:

a. Fifty percent of the federal residential energy property credit provided in Section 25D(a)(1) of the Internal Revenue Code.

b. Fifty percent of the federal residential energy property credit provided in Section 25D(a)(2) of the Internal Revenue Code.

c. Fifty percent of the federal energy credit provided in Section 48(a)(2)(A)(i)(II) of the Internal Revenue Code.

d. Fifty percent of the federal energy credit provided in Section 48(a)(2)(A)(i)(III) of the Internal Revenue Code.

The amount of tax credit claimed by a taxpayer related to paragraphs 42.48(3)“*a*” and “*b*” cannot exceed \$3,000 for a tax year. The amount of tax credit claimed by a taxpayer related to paragraphs 42.48(3)“*c*” and “*d*” cannot exceed \$15,000 for a tax year.

42.48(4) Calculation of credit for systems installed during tax years beginning on or after January 1, 2014, and installed before January 1, 2016. The credit is equal to the sum of the following federal tax credits:

a. Sixty percent of the federal residential energy property credit provided in Section 25D(a)(1) of the Internal Revenue Code.

b. Sixty percent of the federal residential energy property credit provided in Section 25D(a)(2) of the Internal Revenue Code.

c. Sixty percent of the federal energy credit provided in Section 48(a)(2)(A)(i)(II) of the Internal Revenue Code.

d. Sixty percent of the federal energy credit provided in Section 48(a)(2)(A)(i)(III) of the Internal Revenue Code.

The amount of tax credit claimed by a taxpayer related to paragraphs 42.48(4)“a” and “b” cannot exceed \$5,000 per separate and distinct installation. The amount of tax credit claimed by a taxpayer related to paragraphs 42.48(4)“c” and “d” cannot exceed \$20,000 per separate and distinct installation. “Separate and distinct installation” is described in subrule 42.48(7).

42.48(5) *Calculation of credit for systems installed on or after January 1, 2016.* The credit is equal to the sum of the following federal tax credits:

a. Fifty percent of the federal residential energy property credit provided in Section 25D(a)(1) of the Internal Revenue Code. This credit is set to expire December 31, 2021, in accordance with Public Law No. 114-113 Div. P, Title III, § 304.

b. Fifty percent of the federal residential energy property credit provided in Section 25D(a)(2) of the Internal Revenue Code. This credit is set to expire December 31, 2021, in accordance with Public Law No. 114-113 Div. P, Title III, § 304.

c. Fifty percent of the federal energy credit provided in Section 48(a)(2)(A)(i)(II) of the Internal Revenue Code. This credit applies to property the construction of which begins before January 1, 2022, in accordance with Public Law No. 114-113 Div. P, Title III, § 303.

d. Fifty percent of the federal energy credit provided in Section 48(a)(2)(A)(i)(III) of the Internal Revenue Code. This credit is set to expire December 31, 2016, in accordance with Public Law No. 114-113 Div. Q, Title I, § 187.

The amount of tax credit claimed by a taxpayer related to paragraphs 42.48(5)“a” and “b” cannot exceed \$5,000 per separate and distinct installation. The amount of tax credit claimed by a taxpayer related to paragraphs 42.48(5)“c” and “d” cannot exceed \$20,000 per separate and distinct installation. The term “separate and distinct installation” is described in subrule 42.48(7).

42.48(6) *Tax credit award limitations.* The following limitations apply:

a. *Aggregate tax credit award limit.* No more than \$5 million of tax credits will be issued for calendar years beginning on or after January 1, 2015. The annual tax credit allocation cap also includes the solar energy system tax credits provided in rule 701—52.44(422) for corporation income tax and in rule 701—58.22(422) for franchise tax.

b. *Allocation for residential installations.* Beginning with tax year 2014, at least \$1 million of the annual tax credit allocation cap for each tax year is reserved for residential installations. If the total amount of credits for residential installations for a tax year is less than \$1 million, the remaining amount below \$1 million will be allowed for nonresidential installations.

c. *Rollover of unallocated credits.* Beginning with calendar year 2014, if the annual tax credit allocation cap is not reached, the remaining amount below the cap will be allowed to be carried forward to the following tax year and shall not count toward the cap for that year.

42.48(7) *How to apply for the credit.* Timely and complete applications shall be reviewed and approved on a first-come, first-served basis. Applications for the tax credit may be submitted through the Tax Credit Award, Claim, and Transfer Administration System (CACTAS), which applicants may access through the department’s website.

a. *Separate and distinct installation requirement.* A taxpayer may apply for one tax credit for each separate and distinct solar installation. Each separate and distinct installation requires a separate application. In order for an installation to be considered a separate and distinct solar installation, both of the following factors must be met:

(1) Each installation must be eligible for the federal residential energy property credit or the federal energy credit as provided in subrule 42.48(1).

(2) Each installation must have separate metering.

b. *Application deadline.* For installations completed on or after January 1, 2014, the application must be filed by May 1 following the year of installation of the solar energy system. Notwithstanding the foregoing sentence, the following extensions are applicable to installations completed in 2014 and 2015:

(1) Solar energy systems installed during the 2014 calendar year shall be eligible for approval under Iowa Code section 422.11L even if the application is filed after May 1, 2015. Valid and complete applications shall be accepted and approved on a first-come, first-served basis and shall first be eligible for

approval for the tax year during which the application is received, but not before the tax year beginning January 1, 2016.

(2) Solar energy systems installed during the 2015 calendar year shall be eligible for approval under Iowa Code section 422.11L even if the application is filed after May 1, 2016. Valid and complete applications shall be accepted and approved on a first-come, first-served basis and shall first be eligible for approval for the tax year during which the application is received, but not before the tax year beginning January 1, 2017.

c. Contents of the application. The application must contain the following information:

- (1) Name, address and federal identification number of the taxpayer.
- (2) Date of installation of the solar energy system.
- (3) The kilowatt capacity of the solar energy system.
- (4) Copies of invoices or other documents showing the cost of the solar energy system.
- (5) Amount of federal income tax credit for the solar energy system.
- (6) Amount of Iowa tax credit requested.

(7) All applicants must provide a completion sheet from a local utility company or similar documentation verifying that installation of the system has been completed. For nonresidential installations, the completion sheet must indicate the date the installation was placed in service. If a completion sheet from the local utility company or similar documentation is not available, a statement shall be provided that is similar to the one required to be attached to federal Form 3468 when claiming the federal energy credit and that specifies the date the system was placed in service.

(8) For leased solar energy systems where the lessor is the applicant, the lessor should also provide a copy of the solar energy system lease that indicates the property that is the subject of the lease and the parties to the lease agreement. If the lessor is entitled to the Iowa solar energy system tax credit, the lessee will not be entitled to such a credit.

d. Waitlist. If the department receives applications for tax credits in excess of the annual aggregate award limitation, the department shall establish a waitlist for the next year's allocation of tax credits. The applications will be prioritized based on the date the department received the applications and shall first be funded in the order listed on the waitlist. With the exception of the extension described in subparagraphs 42.48(7) "b"(1) and (2) above, only valid applications filed by the taxpayer by May 1 of the year following the year of the installation of the solar energy property shall be eligible for the waitlist. If the annual aggregate cap is reached for the final year in which the federal credit is available, no applications will be carried over to the next year.

Placement on a waitlist shall not constitute a promise binding the state that persons placed on the waitlist will actually receive the credit in a future year. The availability of a tax credit and approval of a tax credit application pursuant to subrule 42.48(7) in a future year is contingent upon the availability of tax credits in that particular year.

e. Certificate issuance. If the application is approved, the department will send a letter to the taxpayer including the amount of the tax credit and providing a tax credit certificate.

f. Claiming the tax credit. The solar energy system tax credit will be claimed on Form IA 148, Tax Credits Schedule. The taxpayer must include with any Iowa tax return claiming the solar energy system tax credit federal Form 5695, Residential Energy Credits, if claiming the residential energy credit or federal Form 3468, Investment Credit, if claiming the business energy credit.

g. Refundability. Any credit in excess of the taxpayer's tax liability is nonrefundable.

h. Carryforward. Any tax credit in excess of the taxpayer's tax liability for the tax year may be credited to the taxpayer's tax liability for the following ten years or until depleted, whichever is earlier.

i. Transferability. The credit may not be transferred to any other person.

42.48(8) Unavailable to those eligible for renewable energy tax credit. A taxpayer who is eligible to receive a renewable energy tax credit provided in rule 701—42.28(422,476C) is not eligible for the solar energy system tax credit.

42.48(9) Allocation of tax credit to owners of a business entity or beneficiaries of an estate or trust. If the taxpayer claiming the tax credit based on a percentage of the federal energy credit under Section 48 of the Internal Revenue Code is a partnership, limited liability company, S corporation, estate or trust

electing to have income taxed directly to the individual, the individual may claim the tax credit. The amount claimed by the individual shall be based upon the pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, estate or trust. The maximum amount of credit available to a partnership, limited liability company, S corporation, estate or trust shall be limited to \$15,000 for installations placed in service in tax years 2012 and 2013 and \$20,000 for installations placed in service in tax years beginning on or after January 1, 2014.

This rule is intended to implement Iowa Code section 422.11L as amended by 2015 Iowa Acts, chapter 124, and 2016 Iowa Acts, House File 2468.

[ARC 0361C, IAB 10/3/12, effective 11/7/12; ARC 1303C, IAB 2/5/14, effective 3/12/14; ARC 1666C, IAB 10/15/14, effective 11/19/14; ARC 2925C, IAB 2/1/17, effective 3/8/17]

701—42.49(422) Volunteer fire fighter, volunteer emergency medical services personnel and reserve peace officer tax credit. Effective for tax years beginning on or after January 1, 2013, a tax credit is available for individual income tax for volunteer fire fighters and volunteer emergency medical services (EMS) personnel. Effective for tax years beginning on or after January 1, 2014, a tax credit is available for individual income tax for reserve peace officers.

42.49(1) Definitions. The following definitions are applicable to this rule:

“Emergency medical services personnel” or “EMS personnel” means an emergency medical care provider, as defined in Iowa Code section 147A.1, who is certified as a first responder in accordance with Iowa Code chapter 147A. For tax years beginning on or after January 1, 2014, “emergency medical services personnel” or “EMS personnel” also includes an individual who is a paid employee of an emergency medical services program and who is also a volunteer emergency medical services personnel in a city, county or area governed by an agreement pursuant to Iowa Code chapter 28E.

“Reserve peace officer” means a reserve peace officer as defined in Iowa Code section 80D.1A who has met the minimum state training standards established by the Iowa law enforcement academy in accordance with Iowa Code chapter 80D.

“Volunteer fire fighter” means a volunteer fire fighter, as defined in Iowa Code section 85.61, who has met the minimum training standards established by the fire service training bureau pursuant to Iowa Code chapter 100B. For tax years beginning on or after January 1, 2014, “volunteer fire fighter” means an individual who is an active member of an organized volunteer fire department in Iowa or is performing services as a volunteer fire fighter for a municipality, township or benefited fire district at the request of the chief or other person in command and who has met the minimum training standards established by the fire service training bureau pursuant to Iowa Code chapter 100B. For tax years beginning on or after January 1, 2014, a volunteer fire fighter also includes an individual who is a paid employee of a fire department and who is also a volunteer fire fighter in a city, county or area governed by an agreement pursuant to Iowa Code chapter 28E.

42.49(2) Calculation of the credit.

a. The credit is equal to \$50 for the tax year beginning January 1, 2013, if the volunteer fire fighter or volunteer EMS personnel was a volunteer for the entire year. The credit is equal to \$100 for tax years beginning on or after January 1, 2014, if the volunteer fire fighter, volunteer EMS personnel or reserve peace officer was a volunteer for the entire year.

b. If the individual was not a volunteer fire fighter or volunteer EMS personnel for the entire 2013 calendar year, the \$50 credit is prorated based on the number of months the individual was a volunteer. Beginning in the 2014 calendar year, if the individual was not a volunteer fire fighter, volunteer EMS personnel or reserve peace officer for the entire year, the \$100 credit is prorated based on the number of months the individual was a volunteer. If the individual was a volunteer during any part of a month, the individual will be considered a volunteer for the entire month. The amount of credit will be rounded to the nearest dollar.

EXAMPLE: An individual became a volunteer fire fighter on April 15, 2013, and remained a volunteer for the rest of calendar year 2013. The individual is considered a volunteer for nine months of 2013. The tax credit for 2013 is equal to \$38 (\$50 multiplied by 9/12 equals \$37.50; rounding to the nearest dollar results in a \$38 credit).

c. If an individual is both a volunteer fire fighter and a volunteer EMS personnel during the same month, a credit can be claimed for only one volunteer position for that month. Therefore, if an individual was both a volunteer fire fighter and volunteer EMS personnel for all of 2013, the tax credit will equal \$50. In addition, beginning in calendar year 2014, if a reserve peace officer is also either a volunteer fire fighter or a volunteer EMS personnel, a credit can be claimed for only one volunteer position for that month.

42.49(3) Verification of eligibility for the tax credit. An individual is required to have a written statement from the fire chief or other appropriate supervisor verifying that the individual was a volunteer fire fighter or volunteer EMS personnel for the months for which the tax credit is being claimed. Beginning with the 2014 tax year, an individual who is a reserve peace officer must have a written statement from the chief of police, sheriff, commissioner of public safety, or other appropriate supervisor verifying that the individual was a reserve peace officer for the months for which the tax credit is being claimed. The written statement does not have to be attached to a tax return claiming the credit. However, the individual may be requested to provide the written statement upon request by the department.

This rule is intended to implement Iowa Code section 422.12 as amended by 2014 Iowa Acts, House File 2459.

[ARC 0398C, IAB 10/17/12, effective 11/21/12; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.50(422) Taxpayers trust fund tax credit. For tax years beginning on or after January 1, 2013, a taxpayers trust fund tax credit is available for Iowa individual income tax. The credit is available for all individual income tax filers, including residents, nonresidents and part-year residents of Iowa, and individuals who file as part of a composite return as described in rule 701—48.1(422), as long as the Iowa return is filed within the extended due date to file an Iowa return. Therefore, a fiscal-year filer whose tax year does not begin on January 1 is eligible to claim the taxpayers trust fund tax credit as long as the return is filed within the extended due date of the Iowa return.

42.50(1) Calculation of the amount of tax credit. The credit is calculated by taking the amount in the Iowa taxpayers trust fund and dividing it by the number of individual income taxpayers who filed Iowa returns by October 31 of the year preceding the year in which the credit is allowed.

EXAMPLE: There is \$120 million in the Iowa taxpayers trust fund at the end of the fiscal year ending June 30, 2013. There were 2,200,000 individuals who filed Iowa income tax returns by October 31, 2013, for tax years beginning on or after January 1, 2012, but beginning before January 1, 2013. This results in an Iowa taxpayers trust fund tax credit of \$54 for the tax year beginning on or after January 1, 2013, but beginning before January 1, 2014 (\$120,000,000 divided by 2,200,000 equals \$54.55, which is rounded down to the nearest whole dollar). All taxpayers who file their Iowa individual income tax return by October 31, 2014, for the tax period beginning on or after January 1, 2013, but beginning before January 1, 2014, will be entitled to claim a \$54 Iowa taxpayers trust fund tax credit.

If the amount of Iowa taxpayers trust fund tax credits claimed on tax returns for a particular year is less than the amount authorized, the difference will be transferred to the Iowa taxpayers trust fund for the next year and will be available as an Iowa taxpayers trust fund tax credit for the next year. There must be a balance in the Iowa taxpayers trust fund of at least \$30 million in order for the Iowa taxpayers trust fund tax credit to be available.

EXAMPLE: There is \$120 million in the Iowa taxpayers trust fund at the end of the fiscal year ending June 30, 2013. The total amount of Iowa taxpayers trust fund tax credit claimed on Iowa tax returns for tax years beginning on or after January 1, 2013, but beginning before January 1, 2014, which were filed on or before October 31, 2014, is \$90 million. The difference of \$30 million will be transferred to the Iowa taxpayers trust fund for the fiscal year ending June 30, 2014. The legislature approves an additional \$60 million to be deposited in the Iowa taxpayers trust fund for the fiscal year ending June 30, 2014. This will result in \$90 million in the Iowa taxpayers trust fund for the fiscal year ending June 30, 2014. If 2,200,000 individuals file Iowa individual income tax returns for tax years beginning on or after January 1, 2013, but beginning before January 1, 2014, by October 31, 2014, this will result in a \$40 Iowa taxpayers trust fund tax credit for the tax year beginning on or after January 1, 2014, but beginning

before January 1, 2015 (\$90,000,000 divided by 2,200,000 equals \$40.90, which is rounded down to the nearest whole dollar).

42.50(2) Claiming the credit on the tax return. The Iowa taxpayers trust fund is claimed on the amount of Iowa tax computed after all other nonrefundable credits allowed in division II of Iowa Code chapter 422 (excluding the Iowa taxpayers trust fund tax credit) are deducted, after the amount of school district surtax described in rule 701—42.1(257,422) and emergency medical services income surtax described in rule 701—42.2(422D) is added, and after all refundable credits (excluding estimated payments and tax withheld) allowed in division II of Iowa Code chapter 422 are deducted. Any Iowa taxpayers trust fund tax credit in excess of the tax liability is not refundable and shall not be carried back to the tax year prior to the tax year in which the credit is claimed and cannot be carried forward to a tax year for any following year.

EXAMPLE: A taxpayer reported a tax liability of \$100 on the taxpayer's 2013 Iowa income tax return. The taxpayer claimed a \$40 personal exemption credit and a \$25 franchise tax credit. This resulted in tax due of \$35 before applying the school district surtax. Taxpayer was subject to a \$2 school district surtax which resulted in total tax due of \$37. Taxpayer was entitled to claim a \$54 Iowa taxpayers trust fund tax credit, but only \$37 of credit could be applied on the 2013 Iowa return. The remaining \$17 of credit cannot be refunded, cannot be applied to a prior year tax liability, and cannot be carried forward to be applied to a subsequent year tax liability.

This rule is intended to implement Iowa Code section 422.11E.
[ARC 1102C, IAB 10/16/13, effective 11/20/13; ARC 1665C, IAB 10/15/14, effective 11/19/14]

701—42.51(422,85GA,SF452) From farm to food donation tax credit. Effective for tax years beginning on or after January 1, 2014, a taxpayer that donates a food commodity that the taxpayer produces may claim a tax credit for Iowa individual income tax. The credit is equal to 15 percent of the value of the commodities donated during the tax year for which the credit is claimed or \$5,000, whichever is less. The value of the commodities shall be determined in the same manner as a charitable contribution of food for federal tax purposes under Section 170(e)(3)(C) of the Internal Revenue Code.

To qualify for the tax credit, the taxpayer (1) must produce the donated food commodity; (2) must transfer title to the donated food commodity to an Iowa food bank or Iowa emergency feeding organization recognized by the department; and (3) shall not receive remuneration for the transfer. The donated food commodity cannot be damaged or out-of-condition and declared to be unfit for human consumption by a federal, state, or local health official. A food commodity that meets the requirements for donated foods pursuant to the federal Emergency Food Assistance Program satisfies this requirement.

To be recognized by the department, a food bank or emergency feeding organization must either be a recognized affiliate of one of the eight partner food banks with the Iowa Food Bank Association or must register with the department. To register with the department, the organization must meet the definition of "emergency feeding organization," "food bank," or "food pantry" as defined by the department of human services in 441—66.1(234). The department of revenue will make registration forms available on the department's website. The department will maintain a list of recognized organizations on the department's website.

Food banks and emergency feeding organizations that receive eligible donations shall be required to issue receipts in a format prescribed by the department for all donations received and must annually submit to the department a receipt log of all the receipts issued during the tax year. The receipt log must be submitted in the form of a spreadsheet with column specifications as provided by the department. Receipt logs showing the donations for the previous calendar year must be delivered electronically or mailed to the department postmarked by January 15 of each year. If a receipt for a taxpayer's claim is not provided by the organization, the taxpayer's claim will be denied.

To claim the credit, a taxpayer shall submit to the department the original receipts that were issued by the food bank or emergency feeding organization. The receipt must include quantity information completed by the food bank or emergency feeding organization, taxpayer information, and a donation valuation consistent with Section 170(e)(3)(C) of the Internal Revenue Code completed by the taxpayer.

Claims must be postmarked on or before January 15 of the year following the tax year for which the claim is requested. Once the department verifies the amount of the tax credit, a letter will be sent to the taxpayer providing the amount of the tax credit and a tax credit certificate number.

Any credit in excess of the tax liability for the tax year may be credited to the tax liability for the following five years or until used, whichever is earlier. The tax credit shall not be carried back to a tax year prior to the year in which the owner redeems the credit. The credit is not transferable to any other person other than the taxpayer's estate or trust upon the death of the taxpayer.

If the producer is a partnership, limited liability company, S corporation, estate or trust electing to have the income taxed directly to the individual, an individual may claim the credit. The amount claimed by an individual must be based on the individual's pro rata share of the individual's earnings of the partnership, limited liability company, S corporation, or estate or trust.

This rule is intended to implement 2013 Iowa Acts, Senate File 452, division XVIII.
[ARC 1138C, IAB 10/30/13, effective 12/4/13]

701—42.52(422) Adoption tax credit. Effective for tax years beginning on or after January 1, 2014, an adoption tax credit is available for individual income tax equal to the amount of qualified adoption expenses paid or incurred by a taxpayer during the tax year related to the adoption of a child. For an adoption finalized on or after January 1, 2014, but before January 1, 2017, the total adoption tax credit claimed for the adoption may not exceed \$2,500. For an adoption finalized on or after January 1, 2017, the total adoption tax credit claimed for the adoption may not exceed \$5,000.

42.52(1) Adoption. For purposes of the credit, an adoption occurs when a child is permanently placed in Iowa by any of the following:

- a. The department of human services;
- b. An adoption service provider as defined in Iowa Code section 600A.2; or
- c. An agency that meets the provisions of the interstate compact in Iowa Code section 232.158.

42.52(2) Child. A "child" is an individual who is under the age of 18 years. "Child" does not include any individual who is 18 years of age or older.

42.52(3) Qualified adoption expenses.

a. *Generally.* "Qualified adoption expenses" means unreimbursed expenses paid or incurred in connection with the adoption of a child. Qualified adoption expenses include all fees and costs related to the adoption of a child, such as:

- (1) Medical and hospital expenses of the biological mother that are incident to the child's birth;
- (2) Welfare agency fees and other reasonable and necessary adoption fees;
- (3) Court costs, attorney fees, and other legal fees;
- (4) Travel expenses, including amounts spent for meals and lodging while away from home; and
- (5) All other fees and costs related to the adoption of a child.

b. *Limitations.* Expenses that are eligible for the federal adoption credit as provided in Section 23(d)(1) of the Internal Revenue Code will be considered qualified adoption expenses. Expenses paid or incurred in violation of state or federal law are not qualified adoption expenses. Expenses that have been reimbursed are not qualified adoption expenses.

42.52(4) Claiming the credit.

a. *Amount eligible for credit.* For tax years beginning on or after January 1, 2014, but beginning before January 1, 2017, the first \$2,500 of qualified adoption expenses is eligible for the credit. For tax years beginning on or after January 1, 2017, the first \$5,000 of qualified adoption expenses is eligible for the credit. The maximum credit amount is determined at the time the adoption becomes final. If the qualified adoption expenses are less than the maximum credit amount, then the total amount of qualified expenses can be claimed as a credit. The amount of tax credit claimed cannot be used as an itemized deduction for adoption expenses provided in 701—subrule 41.5(3).

b. *Claiming the credit in the year the adoption becomes final.* To claim an adoption tax credit, a taxpayer must claim the credit for all qualified adoption expenses paid or incurred in the tax year the adoption becomes final, up to the maximum credit amount provided in paragraph 42.52(4) "a."

EXAMPLE: Michael and Lori are married. Michael and Lori adopt a child who is permanently placed in Iowa. The adoption process begins and becomes final in 2015. Because the adoption becomes final on or after January 1, 2014, but prior to January 1, 2017, Michael and Lori qualify for a maximum credit amount of \$2,500. Michael and Lori incur and pay unreimbursed qualified adoption expenses of \$20,000 in 2015. Michael and Lori jointly file their Iowa individual income tax return in 2015. Michael and Lori may claim an Iowa adoption tax credit of \$2,500 in 2015.

c. Claiming the credit in years other than the year the adoption becomes final. If a taxpayer cannot claim the maximum credit amount provided in paragraph 42.52(4) “a” for the year the adoption becomes final, the taxpayer may amend a prior year’s return to claim any remaining credit for expenses paid in that prior year, or the taxpayer may claim any remaining credit on a subsequent year’s return for expenses paid in that subsequent year. If a qualified adoption expense was incurred in one tax year and paid in another tax year, the taxpayer may only claim a credit for that expense in one year. The total adoption tax credit claimed for all years combined may not exceed the maximum credit amount per adoption provided in paragraph 42.52(4) “a.” An adjustment to a prior’s year return is subject to the limitations in rule 701—40.20(422).

EXAMPLE: Erin adopts a child as a single parent. The child is permanently placed in Iowa. The adoption process begins in 2016 and becomes final in 2017. Because the adoption becomes final on or after January 1, 2017, Erin qualifies for a maximum credit amount of \$5,000. Erin pays and incurs unreimbursed qualified adoption expenses of \$20,000 in 2016 and \$1,000 in 2017. In tax year 2017, Erin may claim an Iowa adoption tax credit equal to the \$1,000 in unreimbursed qualified adoption expenses paid and incurred in 2017. After claiming the credit for tax year 2017, Erin may amend the 2016 return to claim the remaining \$4,000 credit for unreimbursed qualified adoption expenses paid and incurred in 2016.

d. Claiming the credit by two adoptive parents. The adoption tax credit may only be claimed by a person who adopted the child. When a married couple adopts a child together and the couple files jointly on the same return, the credit may only be claimed once between the couple. When any other two persons adopt a child together, including married persons filing separately on the same or different returns or any unmarried persons filing on separate returns, the credit must be divided between the adoptive parents. Two adoptive parents, other than persons who are married filing jointly, may agree to divide the credit in any way. The total adoption tax credit claimed for all years by both parents combined may not exceed the maximum credit amount per adoption provided in paragraph 42.52(4) “a.”

EXAMPLE: Peyton and Kerry are unmarried individuals. Peyton and Kerry adopt a child together. The child is permanently placed in Iowa. The adoption process begins and ends in 2018. Because the adoption becomes final on or after January 1, 2017, Peyton and Kerry qualify for a maximum credit amount of \$5,000. However, Peyton and Kerry pay and incur unreimbursed qualified adoption expenses of only \$3,000 in 2018. Accordingly, Peyton and Kerry may claim an Iowa adoption tax credit of \$3,000 in 2018, which must be divided between them. Peyton and Kerry agree that Peyton will claim \$2,000 of the credit, and Kerry will claim \$1,000 of the credit.

e. Adoption of a special needs child. If a taxpayer adopts a special needs child, the credit under this rule cannot exceed the amount of qualified adoption expenses paid or incurred by the taxpayer during the tax year. The amount of the federal adoption tax credit claimed for the adoption of a special needs child does not affect the amount of the credit under this rule.

EXAMPLE: Francis and Mandy are married. Francis and Mandy adopt a special needs child who is permanently placed in Iowa. The adoption process begins and ends in 2017. Francis and Mandy paid and incurred \$2,000 in unreimbursed qualified adoption expenses related to the adoption during 2017. For federal purposes, Francis and Mandy qualify for a maximum adoption tax credit of \$13,570 for the adoption of a special needs child. For Iowa purposes, Francis and Mandy qualify for a maximum adoption tax credit of \$2,000, which is equal to the amount of unreimbursed qualified adoption expenses they paid or incurred related to the adoption during the tax year.

f. Adoption tax credit in excess of tax liability. Any credit in excess of the taxpayer's tax liability is refundable. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year.

This rule is intended to implement Iowa Code section 422.12A as amended by 2016 Iowa Acts, House File 2468, and by 2017 Iowa Acts, Senate File 433.

[ARC 1665C, IAB 10/15/14, effective 11/19/14; ARC 3749C, IAB 4/11/18, effective 5/16/18]

701—42.53(15) Workforce housing tax incentives program. Effective July 1, 2014, a business which qualifies under the workforce housing tax incentives program is eligible to receive tax incentives for individual income tax. The workforce housing tax incentives program replaces the eligible housing business enterprise zone program. An eligible business under the workforce housing tax incentives program must be approved by the economic development authority and must meet the requirements of 2014 Iowa Acts, House File 2448, section 15. The administrative rules for the workforce housing tax incentives program for the economic development authority may be found at 261—Chapter 48.

42.53(1) Definitions.

“Costs directly related” means expenditures that are incurred for construction of a housing project to the extent that they are attributable directly to the improvement of the property or its structures. “Costs directly related” includes expenditures for property acquisition, site preparation work, surveying, construction materials, construction labor, architectural services, engineering services, building permits, building inspection fees, and interest accrued on a construction loan during the time period allowed for project completion under an agreement entered into pursuant to the program. “Costs directly related” does not include expenditures for furnishings, appliances, accounting services, legal services, loan origination and other financing costs, syndication fees and related costs, developer fees, or the costs associated with selling or renting the dwelling units whether incurred before or after completion of the housing project.

“Qualifying new investment” means costs that are directly related to the acquisition, repair, rehabilitation, or redevelopment of a housing project in this state. For purposes of this rule, “costs directly related to acquisition” includes the costs associated with the purchase of real property or other structures. “Qualifying new investment” includes costs that are directly related to new construction of dwelling units if the new construction occurs in a distressed workforce housing community. The amount of costs that may be used to compute “qualifying new investment” shall not exceed the costs used for the first \$150,000 of value for each dwelling unit that is part of a housing project.

“Qualifying new investment” does not include the following:

1. The portion of the total cost of a housing project that is financed by federal, state, or local government tax credits, grants, forgivable loans, or other forms of financial assistance that do not require repayment, excluding the tax incentives provided under this program.
2. If a housing project includes the rehabilitation, repair, or redevelopment of an existing multi-use building, the portion of the total acquisition costs of the multi-use building, including a proportionate share of the total acquisition costs of the land upon which the multi-use building is situated, that are attributable to the street-level ground story that is used for a purpose that is other than residential.
3. Any costs, including acquisition costs, incurred before the housing project is approved by the economic development authority.

42.53(2) Workforce housing tax incentives. The economic development authority will allocate no more than \$20 million in tax incentives for this program for any fiscal year. A housing business that has entered into an agreement with the economic development authority is eligible to receive the tax incentives described in the following paragraphs:

a. Sales tax refund. A housing business may claim a refund of the sales and use tax described in rule 701—12.9(15).

b. Investment tax credit. A housing business may claim a tax credit in an amount not to exceed 10 percent of the qualifying new investment in a housing project. An individual may claim a tax credit if the housing business is a partnership, limited liability company, S corporation, estate, or trust electing to have income taxed directly to the individual. The amount claimed by the individual shall be based

upon the pro rata share of the individual's earnings from the partnership, limited liability company, S corporation, estate, or trust. Any tax credit in excess of the taxpayer's liability for the tax year is not refundable but may be credited to the tax liability for the following five years or until depleted, whichever is earlier.

42.53(3) *Claiming the tax credit.* The taxpayer must receive a tax credit certificate from the economic development authority to claim the eligible housing business tax credit. The tax credit certificate shall include the taxpayer's name, the taxpayer's address, the taxpayer's tax identification number, the date the project was completed, the amount of the eligible housing business tax credit and the tax year for which the credit may be claimed. In addition, the tax credit certificate shall include a place for the name and tax identification number of a transferee and the amount of the tax credit being transferred, as provided in subrule 42.53(5). The tax credit certificate must be included with the income tax return for the tax period in which the housing is ready for occupancy.

42.53(4) *Basis adjustment.* The increase in the basis of the property that would otherwise result from the qualifying new investment shall be reduced by the amount of the investment tax credit. For example, if a new housing project had qualifying new investment of \$1 million which resulted in a \$100,000 investment tax credit for Iowa tax purposes, the basis of the property for Iowa income tax purposes would be \$900,000.

42.53(5) *Transfer of the credit.* Tax credit certificates issued under an agreement entered into pursuant to subrule 42.53(3) may be transferred to any person. Within 90 days of transfer, the transferee shall submit the transferred tax credit certificate to the department of revenue along with a statement containing the transferee's name, tax identification number, and address, the denomination that each replacement tax credit certificate is to carry, and any other information required by the department of revenue. However, tax credit certificate amounts of less than the minimum amount established in rule by the economic development authority shall not be transferable. Within 30 days of receiving the transferred tax credit certificate and the transferee's statement, the department of revenue shall issue one or more replacement tax credit certificates to the transferee. Each replacement tax credit certificate must contain the information required for the original tax credit certificate and must have the same expiration date that appeared on the transferred tax credit certificate. A tax credit shall not be claimed by a transferee under this rule until a replacement tax credit certificate identifying the transferee as the proper holder has been issued. The transferee may use the amount of the tax credit transferred for any tax year the original transferor could have claimed the tax credit. Any consideration received for the transfer of the tax credit shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit shall not be deducted from Iowa taxable income for individual income, corporation income, or franchise tax purposes.

42.53(6) *Repayment of benefits.* If the housing business fails to maintain the requirements of Iowa Code section 15.353, the taxpayer may be required to repay all or a portion of the tax incentives the taxpayer received. Irrespective of the fact that the statute of limitations to assess the taxpayer for repayment of the income tax credit may have expired, the department may proceed to collect the tax incentives forfeited by failure of the taxpayer to maintain the requirements of 2014 Iowa Acts, House File 2448, section 15. This repayment is required because it is a recovery of an incentive, rather than an adjustment to the taxpayer's tax liability. Details on the calculation of the repayment can be found in 261—subrule 187.5(4) of the administrative rules of the economic development authority. If the business is a partnership, limited liability company, S corporation, estate or trust where the income of the taxpayer is taxed to the individual owner(s) of the business, the department may proceed to collect the tax incentives against the partners, members, shareholders or beneficiaries to whom the tax incentives were passed through. See Decision of the Administrative Law Judge in *Damien & Colette Trebilcock, et al.*, Docket No. 11DORF 042-044, June 11, 2012.

This rule is intended to implement 2014 Iowa Acts, House File 2448.

[ARC 1744C, IAB 11/26/14, effective 12/31/14]

701—42.54(404A,422) Historic preservation and cultural and entertainment district tax credit for projects registered on or after July 1, 2014, and before August 15, 2016. For projects registered

before August 15, 2016, the department of cultural affairs is authorized by the general assembly to award tax credits for a percentage of the qualified rehabilitation expenditures on a qualified rehabilitation project as described in the historic preservation and cultural and entertainment district tax credit program, Iowa Code chapter 404A. The program is administered by the department of cultural affairs with the assistance of the department of revenue. The general assembly has mandated that the department of cultural affairs and the department of revenue adopt rules to jointly administer Iowa Code chapter 404A. In general, the department of cultural affairs is responsible for evaluating whether projects comply with the prescribed standards for rehabilitation while the department of revenue is responsible for evaluating whether projects comply with the tax aspects of the program.

2014 Iowa Acts, House File 2453, amended the historic preservation and cultural and entertainment district tax credit program effective July 1, 2014. The department of revenue's provisions for projects with Part 2 applications approved and tax credits reserved prior to July 1, 2014, are found in rule 701—42.19(404A,422). The department of revenue's provisions for projects registered on or after July 1, 2014, and before August 15, 2016, are found in this rule. The department of cultural affairs' rules related to this program may be found at 223—Chapter 48.

2016 Iowa Acts, House File 2443, amended the program and transferred primary responsibility for its administration to the economic development authority effective August 15, 2016. Effective August 15, 2016, the program is administered by the economic development authority with the assistance of the department of cultural affairs and the department of revenue. The department of revenue's provisions for projects registered on or after August 15, 2016, are found in rule 701—42.55(404A,422). The economic development authority's rules related to the program may be found at 261—Chapter 49. When adopted, the department of cultural affairs' rules related to the program will be found in 223—Chapter 48.

Notwithstanding anything contained herein to the contrary, the department of cultural affairs shall not reserve tax credits under 2013 Iowa Code chapter 404A as amended by 2013 Iowa Acts, chapter 112, section 1, for applicants that do not have an approved Part 2 application and a tax credit reservation on or before June 30, 2014. Projects with approved Part 2 applications and provisional tax credit reservations on or before June 30, 2014, shall be governed by 2013 Iowa Code chapter 404A as amended by 2013 Iowa Acts, chapter 112, section 1; by 223—Chapter 48, Division I; and by rule 701—42.19(404A,422). Projects registered on or after July 1, 2014, but before August 15, 2016, shall be governed by 2014 Iowa Code chapter 404A as amended by 2014 Iowa Acts, House File 2453; by 223—Chapter 48, Division II; and by this rule. Projects registered on or after August 15, 2016, shall be governed by 2016 Iowa Code chapter 404A as amended by 2016 Iowa Acts, House File 2443; by 261—Chapter 49; and by rule 701—42.55(404A,422).

42.54(1) *Application, registration, and agreement for the historic preservation and cultural and entertainment district tax credit.* Taxpayers that want to claim an income tax credit for completing a qualified rehabilitation project must submit an application for approval of the project. The application forms and instructions for the historic preservation and cultural and entertainment district tax credit are available on the department of cultural affairs' website. Once a project is registered, the taxpayer must enter into an agreement with the department of cultural affairs to be eligible for the credit.

42.54(2) *Computation of the amount of the historic preservation and cultural and entertainment district tax credit.* The amount of the historic preservation and cultural and entertainment district tax credit is a maximum of 25 percent of the qualified rehabilitation expenditures verified by the department of cultural affairs and the department of revenue following project completion, up to the amount specified in the agreement between the taxpayer and the department of cultural affairs.

42.54(3) *Qualified rehabilitation expenditures.* "Qualified rehabilitation expenditures" means the same as defined in rule 223—48.22(404A) of the historical division of the department of cultural affairs. In general, the department of cultural affairs evaluates whether expenditures comply with the prescribed standards for rehabilitation while the department of revenue evaluates whether expenditures comply with the tax requirements to be considered qualified rehabilitation expenditures, including whether the expenditures are in accordance with the requirements of Internal Revenue Code Section 47 and its related regulations.

a. Type of property and services eligible. In accordance with Iowa Code section 404A.1(6), the types of property and services claimed for the state tax credit must be “qualified rehabilitation expenditures” in accordance with Internal Revenue Code Section 47. Notwithstanding the foregoing sentence, expenditures incurred by an eligible taxpayer that is a nonprofit organization as defined in Iowa Code section 404A.1(4) shall be considered “qualified rehabilitation expenditures” if they are for “structural components,” as that term is defined in Treasury Regulation § 1.48-1(e)(2), and for amounts incurred for architectural and engineering fees, site survey fees, legal expenses, insurance premiums, development fees and other construction-related costs.

b. Effect of financing sources on eligibility of expenditures. Qualified rehabilitation expenditures do not include expenditures financed by federal, state, or local government grants or forgivable loans unless otherwise allowed under Section 47 of the Internal Revenue Code. For an eligible taxpayer that is a nonprofit organization as defined in Iowa Code section 404A.1(4) that is not eligible for the federal rehabilitation credit, or another person that is not eligible for the federal rehabilitation credit, expenditures financed with federal, state, or local government grants or forgivable loans are not qualified rehabilitation expenditures.

42.54(4) Completion of the qualified rehabilitation project and claiming the tax credit on the Iowa return. After the taxpayer completes a qualified rehabilitation project, the taxpayer will be issued a certificate of completion of the project from the department of cultural affairs if the project complies with the federal standards, as defined in rule 223—48.22(404A). After the department of cultural affairs and the department of revenue verify the taxpayer’s eligibility for the tax credit, the department of cultural affairs shall issue a tax credit certificate.

a. Claiming the credit. For the taxpayer to claim the credit, the certificate must be included with the taxpayer’s income tax return for the tax year in which the rehabilitation project is completed or the income tax return for any tax year within the five years following the tax year of project completion. Taxpayers that elect to delay claiming the credit to a later tax year return as described in this paragraph are subject to the carryforward limitations described in paragraph 42.54(4) “d” below. The credit may be claimed on an amended return so long as the amended return is filed within the statute of limitations applicable to the tax year for which the amended tax return is being filed.

b. Information required. The tax credit certificate shall include the taxpayer’s name, the taxpayer’s address, the taxpayer’s tax identification number, the address or location of the rehabilitation project, the date the project was completed, the amount of the historic preservation and cultural and entertainment district tax credit, and, if applicable, an indication of whether the credit is nonrefundable (see paragraph 42.54(4) “c” below). In addition, the tax credit certificate shall include a place for the name and tax identification number of a transferee and the amount of the tax credit being transferred, as provided in subrule 42.54(5). In addition, if the taxpayer is a partnership, limited liability company, estate or trust, and the tax credit is allocated to the owners or beneficiaries of the entity, a list of the owners or beneficiaries and the amount of credit allocated to each owner or beneficiary shall be provided with the certificate.

c. Refundability. A historic preservation and cultural and entertainment district tax credit in excess of the taxpayer’s tax liability is fully refundable with interest computed under Iowa Code section 422.25. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year. To receive a refundable credit, the taxpayer must elect to receive the credit as refundable at the Part 3 stage of the application process administered by the department of cultural affairs. Once the taxpayer elects to receive a nonrefundable credit, the taxpayer cannot elect to change the credit to a refundable credit or vice versa. See department of cultural affairs’ 223—Chapter 48. If the taxpayer is a transferee, the taxpayer may elect to receive the credit as refundable or nonrefundable when the taxpayer applies to the department of revenue for transfer of the tax credit as described in subrule 42.54(5).

d. Carryforward. If the taxpayer elects to receive a nonrefundable historic preservation and cultural and entertainment district tax credit as described in paragraph 42.54(4) “b,” the amount in excess of the taxpayer’s tax liability may be carried forward for five years following the tax year in which the project is completed, or until it is depleted, whichever is earlier. A tax credit shall not be

carried back to a tax year prior to the tax year in which the taxpayer is first eligible to claim the credit. Regardless of whether the taxpayer elects to claim the tax credit on a tax return for a year that is later than the year of project completion as described in paragraph 42.54(4)“a,” the taxpayer must utilize the entire credit within five years following the tax year of the project completion as described in this paragraph; any credit amount that is not utilized within the five-year carryforward period is forfeited. The five-year carryforward limitation does not apply if the taxpayer elects to receive a refundable credit, the excess of which may be credited to future tax years as an overpayment.

e. Allocation of historic preservation and cultural and entertainment district tax credits to the individual owners of the entity or beneficiaries of an estate or trust. A partnership, limited liability company or S corporation may designate the amount of the tax credit to be allocated to each partner, member or shareholder. The credit does not have to be allocated based on the pro rata share of earnings of the partnership, limited liability company or S corporation. For an individual claiming a tax credit of an estate or trust, the amount claimed by the individual shall be based upon the pro rata share of the individual’s earnings from the estate or trust.

42.54(5) Transfer of the historic preservation and cultural and entertainment district tax credit. The historic preservation and cultural and entertainment district tax credit certificates may be transferred to any person or entity. The transferee may use the amount of the tax credit transferred against the taxes imposed in Iowa Code chapter 422, divisions II, III, and V, and in Iowa Code chapter 432, for any tax year the original transferor could have claimed the tax credit. Transferees must elect to receive either a refundable or nonrefundable tax credit. Once the transferee elects to receive a nonrefundable credit, the transferee cannot elect to change the credit to a refundable credit or vice versa. A tax credit certificate of less than \$1,000 shall not be transferable.

a. Transfer process—information required. Within 90 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department of revenue along with a statement that contains the transferee’s name, address and tax identification number, the amount of the tax credit being transferred, an election to receive either a refundable or nonrefundable tax credit, and the amount of all consideration provided in exchange for the tax credit and the names of recipients of any consideration provided in exchange for the tax credit. If a payment of money was any part of the consideration provided in exchange for the tax credit, the transferee shall list the amount of the payment of money in its statement to the department of revenue. If any part of the consideration provided in exchange for the tax credit included nonmonetary consideration, including but not limited to any promise, representation, performance, discharge of debt or nonmonetary rights or property, the tax credit transferee shall describe the nature of the nonmonetary consideration and disclose any value the transferor and transferee assigned to the nonmonetary consideration. The tax credit transferee must indicate on its statement to the department of revenue if no consideration was provided in exchange for the tax credit. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department of revenue will issue the replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company or S corporation, the transferee shall provide a list of the partners, members or shareholders and information on how the historic preservation and cultural and entertainment district tax credit should be divided among the partners, members or shareholders. The transferee shall also provide the tax identification numbers and addresses of the partners, members or shareholders. The certificate must have the same information required for the original tax certificate and must have the same expiration date as the original tax credit certificate. The transferee may not claim a tax credit until a replacement certificate identifying the transferee as the proper holder has been issued.

b. Consideration. Any consideration received for the transfer of the tax credit shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

c. Unlimited number of transferees and subsequent transfers. There is no limitation on the number of transferees to whom the credit may be transferred. There is no limitation on the number of times that the credit may be retransferred by a transferee. The transferor may divide the credit into multiple credits of alternate denominations so long as the resulting credits are for amounts of no less than \$1,000.

d. Carryforward limitations on transferees. The transferee may use the amount of the transferred tax credit for any tax year that the original transferor could have claimed the tax credit. The carryforward limitations described in paragraph 42.54(4) “d” shall apply.

42.54(6) Appeals. Challenges to an action by the department of revenue related to tax credit transfers, the claiming of tax credits, tax credit revocation, or repayment or recovery of tax credits must be brought pursuant to 701—Chapter 7.

This rule is intended to implement Iowa Code chapter 404A as amended by 2016 Iowa Acts, House File 2443, and Iowa Code section 422.11D.

[ARC 1968C, IAB 4/15/15, effective 5/20/15; ARC 2928C, IAB 2/1/17, effective 3/8/17]

701—42.55(404A,422) Historic preservation and cultural and entertainment district tax credit for projects registered on or after August 15, 2016. The economic development authority is authorized by the general assembly to award tax credits for a percentage of the qualified rehabilitation expenditures on a qualified rehabilitation project as described in the historic preservation and cultural and entertainment district tax credit program, Iowa Code chapter 404A. The program is administered by the economic development authority with the assistance of the department of cultural affairs and the department of revenue. The general assembly has mandated that the economic development authority, the department of cultural affairs and the department of revenue adopt rules as necessary to administer Iowa Code chapter 404A. In general, the department of revenue is responsible for administering tax credit transfers and processing and auditing tax credits claimed on returns. For the economic development authority’s rules on the credit program, see 261—Chapter 49. For the department of cultural affairs’ rules on the credit program, see 223—Chapter 48.

42.55(1) Program transition. 2016 Iowa Acts, House File 2443, made several changes to the credit program, including transferring primary responsibility for the program’s administration from the department of cultural affairs to the economic development authority. Projects registered prior to August 15, 2016, remain under the purview of the department of cultural affairs, with assistance from the department of revenue. For department of revenue rules related to projects registered prior to August 15, 2016, see rules 701—42.54(404A,422) and 701—42.19(404A,422).

42.55(2) Application, registration, and agreement for the historic preservation and cultural and entertainment district tax credit. For rules on the application, registration, and agreement process, see economic development authority rules, 261—Chapter 49.

42.55(3) Computation of the amount of the historic preservation and cultural and entertainment district tax credit. The amount of the historic preservation and cultural and entertainment district tax credit is a maximum of 25 percent of the qualified rehabilitation expenditures verified by the economic development authority following project completion, up to the amount specified in the agreement between the taxpayer and the economic development authority. For more information on the credit computation, see economic development authority rules, 261—Chapter 49. The amount remains subject to audit by the department of revenue when the credit is claimed on the taxpayer’s tax return.

42.55(4) Qualified rehabilitation expenditures. “Qualified rehabilitation expenditures” means the same as defined in Iowa Code section 404A.1(7) and rule 261—49.5(404A) of economic development authority rules. In the event of an audit, the department of revenue evaluates whether expenditures comply with the agreement between the economic development authority and the eligible taxpayer, as well as with applicable statutes and rules, including Internal Revenue Code Section 47 and its related regulations.

42.55(5) Completion of the qualified rehabilitation project and claiming the tax credit. After the economic development authority verifies the taxpayer’s eligibility for the tax credit, the economic development authority shall issue a tax credit certificate. For more information on credit certificate issuance, see economic development authority rules, 261—Chapter 49.

a. Claiming the credit. For the taxpayer to claim the credit, the certificate must be included with the taxpayer’s income tax return for the tax year in which the rehabilitation project is completed or the income tax return for any year within the five years following the year of project completion. Taxpayers that elect to delay claiming the credit to a later year’s return as described in this paragraph are subject to

the carryforward limitations described in paragraph 42.55(5) “d” below. The credit may be claimed on an amended return so long as the amended return is filed within the statute of limitations applicable to the tax year for which the amended tax return is being filed.

b. Information required. The tax credit certificate shall include the taxpayer’s name, the taxpayer’s address, the taxpayer’s tax identification number, the address or location of the rehabilitation project, the date the project was completed, the amount of the historic preservation and cultural and entertainment district tax credit, and, if applicable, an indication of whether the credit is nonrefundable (see paragraph 42.55(5) “c” below). In addition, the tax credit certificate shall include a place for the name and tax identification number of a transferee and the amount of the tax credit being transferred, as provided in subrule 42.55(6). In addition, if the taxpayer is a partnership, limited liability company, estate or trust, and the tax credit is allocated to the owners or beneficiaries of the entity, a list of the owners or beneficiaries and the amount of credit allocated to each owner or beneficiary shall be provided with the certificate.

c. Refundability. A historic preservation and cultural and entertainment district tax credit in excess of the taxpayer’s tax liability is fully refundable with interest computed under Iowa Code section 422.25. In lieu of claiming the refund, the taxpayer may elect to have the overpayment credited to the tax liability for the following tax year. To receive a refundable credit, the taxpayer must elect to receive the credit as refundable at the Part 3 stage of the application process administered by the economic development authority. See the economic development authority’s rule 261—49.15(404A). Once the taxpayer elects to receive a nonrefundable credit, the taxpayer cannot elect to change the credit to a refundable credit or vice versa. If the taxpayer is a transferee, the taxpayer may elect to receive the credit as refundable when the taxpayer applies to the department of revenue for transfer of the tax credit as described in subrule 42.55(6).

d. Carryforward. If the taxpayer elects to receive a nonrefundable historic preservation and cultural and entertainment district tax credit as described in paragraph 42.55(5) “b,” the amount in excess of the taxpayer’s tax liability may be carried forward for five years following the tax year in which the project is completed, or until it is depleted, whichever is earlier. A tax credit shall not be carried back to a tax year prior to the tax year in which the taxpayer is first eligible to claim the credit. Regardless of whether the taxpayer elects to claim the tax credit on a tax return for a year that is later than the year of project completion as described in paragraph 42.55(5) “a,” the taxpayer must utilize the entire credit within five years following the tax year of the project completion as described in this paragraph; any credit amount that is not utilized within the five-year carryforward period is forfeited. The five-year carryforward limitation does not apply if the taxpayer elects to receive a refundable credit, the excess of which may be credited to future tax years as an overpayment.

e. Allocation of historic preservation and cultural and entertainment district tax credits to the individual owners of the entity or beneficiaries of an estate or trust. A partnership, limited liability company or S corporation may designate the amount of the tax credit to be allocated to each partner, member or shareholder. The credit does not have to be allocated based on the pro rata share of earnings of the partnership, limited liability company or S corporation. For an individual claiming a tax credit of an estate or trust, the amount claimed by the individual shall be based upon the pro rata share of the individual’s earnings from the estate or trust.

42.55(6) Transfer of the historic preservation and cultural and entertainment district tax credit. The historic preservation and cultural and entertainment district tax credit certificates may be transferred to any person or entity. The transferee may use the amount of the tax credit transferred against the taxes imposed in Iowa Code chapter 422, divisions II, III, and V, and in Iowa Code chapter 432, for any tax year that the original transferor could have claimed the tax credit. Transferees must elect to receive either a refundable or nonrefundable tax credit. Once the transferee elects to receive a nonrefundable credit, the transferee cannot elect to change the credit to a refundable credit or vice versa. A tax credit certificate of less than \$1,000 shall not be transferable.

a. Transfer process—information required. Within 90 days of transfer of the tax credit certificate, the transferee must submit the transferred tax credit certificate to the department of revenue along with a statement that contains the transferee’s name, address and tax identification number, the amount of the

tax credit being transferred, an election to receive either a refundable or nonrefundable tax credit, and the amount of all consideration provided in exchange for the tax credit and the names of recipients of any consideration provided in exchange for the tax credit. If a payment of money was any part of the consideration provided in exchange for the tax credit, the transferee shall list the amount of the payment of money in its statement to the department of revenue. If any part of the consideration provided in exchange for the tax credit included nonmonetary consideration, including but not limited to any promise, representation, performance, discharge of debt or nonmonetary rights or property, the tax credit transferee shall describe the nature of the nonmonetary consideration and disclose any value the transferor and transferee assigned to the nonmonetary consideration. The tax credit transferee must indicate on its statement to the department of revenue if no consideration was provided in exchange for the tax credit. Within 30 days of receiving the transferred tax credit certificate and the statement from the transferee, the department of revenue will issue the replacement tax credit certificate to the transferee. If the transferee is a partnership, limited liability company or S corporation, the transferee shall provide a list of the partners, members or shareholders and information on how the historic preservation and cultural and entertainment district tax credit should be divided among the partners, members or shareholders. The transferee shall also provide the tax identification numbers and addresses of the partners, members or shareholders. The certificate must have the same information required for the original tax credit certificate and must have the same expiration date as the original tax credit certificate. The transferee may not claim a tax credit until a replacement certificate identifying the transferee as the proper holder has been issued.

b. Consideration. Any consideration received for the transfer of the tax credit shall not be included in Iowa taxable income for individual income, corporation income or franchise tax purposes. Any consideration paid for the transfer of the tax credit shall not be deducted from Iowa taxable income for individual income, corporation income or franchise tax purposes.

c. Unlimited number of transferees and subsequent transfers. There is no limitation on the number of transferees to whom the credit may be transferred. There is no limitation on the number of times that the credit may be retransferred by a transferee. The transferor may divide the credit into multiple credits of alternate denominations so long as the resulting credits are for amounts of no less than \$1,000.

d. Carryforward limitations on transferees. The transferee may use the amount of the transferred tax credit for any tax year that the original transferor could have claimed the tax credit. The carryforward limitations described in paragraph 42.55(4) “d” shall apply.

42.55(7) Appeals. Challenges to an action by the department of revenue related to tax credit transfers, the claiming of tax credits, tax credit revocation, or repayment or recovery of tax credits must be brought pursuant to 701—Chapter 7.

This rule is intended to implement Iowa Code chapter 404A as amended by 2016 Iowa Acts, House File 2443, and Iowa Code section 422.11D.

[ARC 2928C, IAB 2/1/17, effective 3/8/17]

701—42.56(15,422) Renewable chemical production tax credit program. An eligible business that has received a renewable chemical production tax credit certificate from the economic development authority may claim a tax credit against individual income tax. The credit is equal to the product of five cents multiplied by the number of pounds of renewable chemicals produced in Iowa from biomass feedstock by the eligible business during a given production year, subject to the limitations described in Iowa Code sections 15.315 through 15.322, 261—Chapter 81, and this rule. The economic development authority’s rules on eligibility for the credit may be found in 261—Chapter 81.

42.56(1) Application and agreement for the credit. To be eligible for the tax credit, the eligible business must apply to and enter into an agreement with the economic development authority. The economic development authority’s rules on the application and agreement process may be found in 261—Chapter 81.

42.56(2) Computation of the amount of credit and certificate issuance. Upon establishing that all requirements of the program and the agreement have been fulfilled and verifying the taxpayer’s eligibility for the tax credit, the economic development authority calculates the credit. Then the economic development authority issues the related tax credit certificate to the eligible business stating

the amount of the renewable chemical production tax credit that the eligible business may claim. A tax credit certificate shall not be issued by the economic development authority prior to July 1, 2018. The economic development authority's rules on credit certificate issuance may be found in 261—Chapter 81.

42.56(3) Claiming the tax credit.

a. Claiming the credit, generally. To claim the credit, a taxpayer must include one or more tax credit certificates with the taxpayer's tax return for the tax year during which the eligible business was issued the tax credit certificate or certificates. If the taxpayer claiming the credit has already filed a return for the tax year for which the credit certificate was issued, the taxpayer may claim the credit on an amended return. The taxpayer must file the amended return within the statute of limitations applicable to such amended return. No tax credit may be claimed under this program by a taxpayer prior to September 1, 2018.

b. Claiming the credit of a pass-through entity. To claim the credit of an eligible business that is a pass-through entity, an individual taxpayer must claim the credit on the tax return for the tax year during which the eligible business received the tax credit certificate. Such tax year may be either the tax year of the eligible business or of the individual.

EXAMPLE: A partnership has a fiscal year of September 2017 through August 2018. The partnership receives a renewable chemical production tax credit certificate under this program in July 2018, which is during the partnership's 2017 tax year. A partner in the partnership files individual returns on a calendar year basis, which means that the credit was issued in the partner's 2018 tax year. That partner may file an amended 2017 tax return to claim the credit based on the partnership's tax year, or that partner may claim the credit on the partner's 2018 tax return based on the partner's own tax year.

c. Information required. The tax credit certificate shall include the taxpayer's name, address, tax identification number, the amount of the credit, the name of the eligible business, and any other information required by the department of revenue.

d. Allocation to the individual owners of the entity or beneficiaries of an estate or trust. An individual may claim the credit of a partnership, limited liability company, S corporation, cooperative organized under Iowa Code chapter 501 and filing as a partnership for tax purposes, estate, or trust electing to have income taxed directly to the individual. The amount claimed by the individual shall be based on the pro rata share of the individual's earnings from the partnership, limited liability company, S corporation, cooperative, estate, or trust.

e. Refundability. Any credit in excess of the tax liability is refundable. In lieu of claiming a refund, the taxpayer may elect to have the overpayment shown on the taxpayer's final, completed return credited to the tax liability for the following tax year.

f. Transferability. Tax credit certificates shall not be transferred to any other person.

g. Rescission and recapture. The tax credit certificate, unless rescinded by the economic development authority, shall be accepted by the department of revenue, subject to any conditions or restrictions placed upon the face of the tax credit certificate by the economic development authority and subject to the limitations of the program. Should the economic development authority reduce, terminate, or rescind any tax credits issued under the program, the eligible business may be subject to the repayment or recapture of any credits already claimed. The economic development authority's rules related to the program may be found in 261—Chapter 81. The repayment of tax credits or recapture by the department of revenue shall be accomplished in the same manner as provided in Iowa Code section 15.330(2).

This rule is intended to implement Iowa Code section 422.10B.

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CHAPTER 103
STATE-IMPOSED AND LOCALLY IMPOSED HOTEL AND
MOTEL TAXES—ADMINISTRATION
[Prior to 12/17/86, Revenue Department[730]]

701—103.1(423A) Definitions, administration, and imposition.

103.1(1) Definitions. For the purposes of this chapter and 701—Chapters 104 and 105, unless the context otherwise requires:

“*Department*” means the department of revenue.

“*Director*” means the director of the department of revenue.

“*Land use district*” means a district created under Iowa Code chapter 303, subchapter IV.

“*Lessor*” means any person engaged in the business of renting lodging to users. “Lessor” is synonymous with the word “retailer.”

“*Locally imposed tax*” means the hotel and motel tax levied by Iowa Code section 423A.4.

“*Lodging*” means rooms, apartments, or sleeping quarters in a hotel, motel, inn, public lodging house, rooming house, or manufactured or mobile home which is tangible personal property, or in a tourist court, or in any place where sleeping accommodations are furnished to transient guests for rent, whether with or without meals.

“*Person*” means the same as the term is defined in rule 701—211.1(423).

“*Renting*” or “*rent*” means a transfer of possession or control of lodging for a fixed or indeterminate term for consideration and includes any kind of direct or indirect charge for such lodging or its use.

“*Sales price*” means the amount of consideration for renting of lodging and means the same as the term is defined in rule 701—211.1(423).

“*State-imposed tax*” means the hotel and motel tax levied by Iowa Code section 423A.3.

“*Tax*” or “*hotel and motel tax*” means either the state-imposed or locally imposed hotel and motel tax levied by Iowa Code sections 423A.3 and 423A.4, respectively.

“*User*” means a person to whom lodging is rented.

All other words and phrases used in this chapter and 701—Chapters 104 and 105 and defined in rule 701—211.1(423) have the meaning set forth in that rule for the purposes of these chapters.

103.1(2) Administration. The department is charged with the administration of the tax, subject to the rules, regulations, and direction of the director. The department is required to administer the tax as nearly as possible in conjunction with the administration of the state sales tax except that portion of the law which implements the streamlined sales and use tax agreement. Therefore, the term “retailer” will be used interchangeably between the two taxes.

103.1(3) Imposition. A state-imposed tax of 5 percent is imposed upon the sales price for the rental of any lodging if the rental occurs in this state. The state-imposed tax shall be collected by any lessor of lodging from the user of that lodging. The lessor shall add the tax to the sales price of the lodging, and the state-imposed tax, when collected, shall be stated as a distinct item, separate and apart from the sales price of the lodging and the local tax imposed, if any, under Iowa Code section 423A.4.

103.1(4) A city, county, or land use district may impose a tax on lodging, at a rate not to exceed 7 percent, which shall be imposed in increments of one or more full percentage points upon the sales price from the renting of lodging. See 701—Chapter 105 for more information on locally imposed hotel and motel tax.

This rule is intended to implement Iowa Code sections 423A.3 and 423A.4.
[ARC 3750C, IAB 4/11/18, effective 5/16/18]

701—103.2(423A) Statute of limitations, supplemental assessments and refund adjustments. Within three years after a return is filed, the department shall examine it, determine the tax due, and give notice of assessment to the taxpayer. If no return has been filed, the department may determine the tax due and give notice thereof. If such determination is based upon an examination of books, papers, records, or memoranda, such an examination will not include any transactions completed three years or more prior to such examination.

Whenever books and records are examined by an employee designated by the director, whether to verify a return or claim for refund or in making an audit, an assessment must be issued within one year from the date of the completion of the examination. If not, the period for which the books and records were examined becomes closed and no assessment can be made. In no case is the one-year period of limitation an extension of or in addition to the three-year period of limitation.

The department may, at any time within the period prescribed for assessment or refund adjustment, make a supplemental assessment or refund adjustment whenever it is ascertained that any assessment or refund adjustment is imperfect or incomplete in any respect.

If an assessment or refund adjustment is appealed (protested under rule 701—7.8(17A)) and is resolved whether by informal proceedings or by adjudication, the department and the taxpayer are precluded from making a supplemental assessment or refund adjustment concerning the same issue involved in such appeal for the same tax period unless there is a showing of mathematical or clerical error or a showing of fraud or misrepresentation.

This rule is intended to implement Iowa Code sections 423.37 and 422.70 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

[ARC 0251C, IAB 8/8/12, effective 9/12/12]

701—103.3(423A) Credentials and receipts. Employees of the department have official credentials, and the retailer should require proof of the identity of persons claiming to represent the department. No charges shall be made or gratuities of any kind accepted by an employee of the department for assistance given in or out of the office of the department.

All employees authorized to collect money are supplied with official receipt forms. When cash is paid to an employee, the retailer should require the employee to issue an official receipt. Such receipt shall show the retailer's name, address and permit number; the purpose for the payment; and the amount of the payment. The retailer should retain all receipts, and only official receipts for payment will be recognized by the department.

This rule is intended to implement Iowa Code sections 422.68(1) and 422.70 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.4(423A) Retailers required to keep records.

103.4(1) Every retailer shall keep and preserve the following records:

a. A daily record of the amount of all cash and time payments and credit sales from the renting of rooms subject to tax under Iowa Code chapter 423A.

b. A record of all deductions and exemptions taken in filing a tax return.

103.4(2) The records required in this rule must be preserved for a period of three years and open for examination by the department during this period of time.

103.4(3) Retailers performing all or part of their record keeping and retention of books, records, and other sources of information under electronic data interchange process or technology, see 701—subrule 11.4(4).

103.4(4) If a tax liability has been assessed and an appeal is pending to the department, district court or an appellate court, books, papers, records, memoranda or documents specified in this rule that relate to the period covered by the assessment shall be preserved until the final disposition of the appeal. This provision applies equally to parties to the appeal and other retailers who could claim a refund as a result of the resolution of the appeal.

103.4(5) Failure to keep and preserve adequate records shall be grounds for revocation of the state-imposed tax permit.

This rule is intended to implement Iowa Code section 423.41 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

[ARC 2657C, IAB 8/3/16, effective 9/7/16]

701—103.5(423A) Audit of records. The department shall have the right and duty to examine or cause to be examined the books, papers, records, memoranda or documents of a taxpayer for the purposes of verifying the correctness of a return filed or estimating the tax liability of any retailer. The right

to examine records includes the right to examine copies of the retailer's state and federal income tax returns. When a retailer fails or refuses to produce the records for examination when requested by the department, the director shall have authority to require, by a subpoena, the attendance of the retailer and any other witness whom the department deems necessary or expedient to examine and compel the retailer and witness to produce books, papers, records, memoranda or documents relating in any manner to the tax.

The department shall have the obligation to inform the retailer when an examination of the retailer's books, papers, records, memoranda or documents has been completed and the amount of tax liability, if any, due upon completion of the audit. Tax liability includes the amount of tax, interest, penalty and fees which may be due.

This rule is intended to implement Iowa Code sections 422.70 and 423.41 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.6(423A) Billings.

103.6(1) Notice of adjustments.

a. An employee of the department, designated by the director to examine returns or make audits, who discovers discrepancies in returns or learns that a sales price subject to the tax may not have been listed, in whole or in part, or that no return was filed when one was due, is authorized to notify the person of the discovery by ordinary mail. The notice shall not be termed an assessment. It merely informs the person what amount would be due if the information discovered is correct.

b. Right of person upon receipt of notice of adjustment. A person who has received notice of an adjustment in connection with a return may pay the additional amount stated to be due. If payment is made, and the person wishes to contest the matter, the person should then file a claim for refund. However, payment will not be required until a certified assessment has been made (although interest will continue to accrue on any amount of tax which is determined to be due if payment is not made). If no payment is made, the person may discuss with the employee who notified the person of the discrepancy, either in person or through correspondence, all matters of fact and law which the person considers relevant to the situation. This person may also ask for a conference with the department. Documents and records supporting the person's position may be requested.

c. Power of employee to compromise tax claim. Only the director has the power to compromise any tax claims. The power of the employee who notified the person of the discrepancy is limited to the determination of the correct amount of tax.

103.6(2) Notice of assessment. If, after following the procedure outlined in paragraph 103.6(1) "b," no agreement is reached and the person does not pay the amount determined to be correct within 20 days, a notice of the amount of tax due shall be sent to the person responsible for paying the tax. This notice of assessment shall bear the signature of the director and will be sent by mail.

If the notice of assessment is timely protested according to the provisions of rule 701—7.8(17A) and Iowa Code section 423.37, proceedings to collect the tax will not be commenced until the protest is ultimately determined, unless the department has reason to believe that a delay caused by such appeal proceedings will result in an irrevocable loss of tax ultimately found to be due and owing the state of Iowa. The department will consider a protest to be timely if filed no later than 60 days following the date of the assessment notice. See rule 701—7.8(17A).

This rule is intended to implement Iowa Code sections 422.70, 423.37, and 423.39 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

[ARC 0251C, IAB 8/8/12, effective 9/12/12]

701—103.7(423A) Collections. If determined expedient or advisable to do so, the director may enforce the collection of the tax liability which has been determined to be due. In such action, the attorney general shall appear for the department and have the assistance of the county attorney in the county in which the action is pending.

The remedies for the enforcement and collection of the tax are cumulative, and action taken by the department or attorney general shall not be construed to be an election on the part of the state or any of its officers to pursue any remedy to the exclusion of any other remedy.

This rule is intended to implement Iowa Code sections 422.70, 423.37, and 423.39 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.8(423A) No property exempt from distress and sale. The provisions of Iowa Code section 422.26 apply with respect to a tax liability determined to be due by the department. The department shall proceed to collect the tax liability after it has become delinquent; and no property of the taxpayer is exempt from the process whereby the tax is collected.

This rule is intended to implement Iowa Code sections 422.26 and 423.42 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.9(423A) Information confidential. When requested to do so by any person having a legitimate interest in such information, the department shall, after being presented with sufficient proof of the entire situation, disclose to such person the amount of unpaid taxes due by a taxpayer. Such person shall provide the department with sufficient proof consisting of all relevant facts and the reason or reasons for seeking information as to the amount of unpaid taxes due by the taxpayer. The information sought shall not be disclosed if the department determines that the person requesting information does not have a legitimate interest. The director may also authorize the examination of returns filed by a retailer by (1) other officers of the state of Iowa, (2) tax officers of another state if a reciprocal arrangement exists, or (3) tax officers of the federal government if a reciprocal arrangement exists. The director is also empowered to publish annual statistical reports relating to the operation of the tax. See rule 701—6.3(17A).

All other information obtained by employees of the department in the performance of their official duties is confidential as provided by law and cannot be disclosed.

This rule is intended to implement Iowa Code section 422.72 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.10(423A) Bonding procedure. The director may, when necessary and advisable in order to secure the collection of the tax, require any person subject to the tax to file with the department a bond in an amount which the director may fix, or in lieu of such bond, securities approved by the director in an amount which the director may prescribe.

The determination of when and in what amount a bond is required will be determined pursuant to rule 701—11.10(422). The bond required under this rule and rule 701—11.10(422) shall be a single requirement with the amount to be determined with reference to both the potential state-imposed tax (see 701—Chapter 241) and the locally imposed tax liabilities, plus any applicable local option taxes. Whether or not the person required to post the bond files a monthly deposit for state-imposed tax purposes, the basis for determining the locally imposed tax portion of the bond shall be an amount sufficient to cover nine months or three quarters of tax liability.

This rule is intended to implement Iowa Code section 423.35 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.11(423A) Sales tax. The hotel and motel tax is levied in addition to the state sales tax imposed in Iowa Code chapter 423. Additionally, the director of revenue is required to administer the hotel and motel tax as nearly as possible in conjunction with the administration of the state sales tax law except that portion of the law which implements the streamlined sales and use tax agreement. See 701—Chapters 12 to 14 for details. The computation of the tax shall be based on the sales price of the room excluding the sales tax.

This rule is intended to implement 2005 Iowa Code Supplement sections 423A.3, 423A.4, and 423A.6.

701—103.12(423A) Judicial review. Judicial review of actions of the director may be sought in accordance with the terms of the Iowa administrative procedure Act in a manner similar to that provided for review of sales tax matter. See 701—Chapter 7 for details.

This rule is intended to implement Iowa Code section 423.38 and 2005 Iowa Code Supplement sections 423A.3 and 423A.4.

701—103.13(423A) Registration. All persons who are required to collect and remit the locally imposed tax are required to register with the department as a hotel and motel tax collector.

This rule is intended to implement 2005 Iowa Code Supplement section 423A.6.

701—103.14(423A) Notification. Before the local option hotel and motel tax of a city, county, or land use district can become effective, be revised, or be repealed, 45 days' notice of such action must be given to the director in writing by mail.

This rule is intended to implement Iowa Code section 423A.4.
[ARC 3750C, IAB 4/11/18, effective 5/16/18]

701—103.15(423A) Certification of funds. Within 45 days after the date that the quarterly returns and payments are due, the director will certify to the treasurer of state the amount of locally imposed tax to be transferred from the general fund to the local transient guest tax fund, which is to be distributed to each city, county, and land use district that has adopted the tax. Payments received after the date of certification will remain in the general fund until the next quarterly certification.

This rule is intended to implement Iowa Code section 423A.7.
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CHAPTER 104
HOTEL AND MOTEL—
FILING RETURNS, PAYMENT OF TAX, PENALTY, AND INTEREST
[Prior to 12/17/86, Revenue Department[730]]

701—104.1(423A) Returns, time for filing. On the quarterly sales tax return, every retailer shall report the gross sales subject to the hotel and motel tax for the entire quarter, listing allowable deductions and figuring tax for the entire quarter. The information required for the computation of the hotel and motel tax liability shall be separate from that required for the computation of the retail sales tax liability. Such information and computation must be stated and computed separately, even though the total tax liability may be paid with a single remittance.

The quarterly reports are due on the last day of the month following the end of the calendar quarter during which the tax is collected. If a person is required to collect the hotel and motel tax and file a monthly deposit for retail sales tax purposes, the monthly deposit should not include the hotel and motel tax collected during the period covered by the deposit.

When the due date falls on a Saturday, Sunday or legal holiday, the return is due the first business day following the Saturday, Sunday or legal holiday. If a return is placed in the mail, properly addressed and postage paid, and postmarked on or before the due date for filing, no penalty will attach should the return not be received until after that date. Mailed returns should be addressed to Sales and Use Tax Processing, Department of Revenue, Hoover State Office Building, P.O. Box 10412, Des Moines, Iowa 50319.

This rule is intended to implement Iowa Code sections 421.14 and 423.31 and 2005 Iowa Code Supplement section 423A.6.

701—104.2(423A) Remittances. The correct amount of tax collected and due shall accompany the forms prescribed by the department. The name, address and sales tax permit number of the sender and amount of tax for the quarterly remittance shall be stated. Every return shall be signed and dated. Reporting forms and a self-addressed return envelope shall be furnished by the department to the retailer; and, when feasible, every retailer shall use them when completing and mailing the return and remittance. All remittances shall be made payable to the Treasurer of the State of Iowa.

This rule is intended to implement Iowa Code section 423.31 and 2005 Iowa Code Supplement section 423A.6.

701—104.3(423A) Permits. An Iowa sales tax permit will be required under this chapter. However, the director may require all persons responsible for collecting and remitting a hotel-motel tax to register with the department.

Any person not in the business of renting rooms to transient guests, but who regularly rents rooms or residences at varying locations to transient guests, may register once under this chapter.

This rule is intended to implement 2005 Iowa Code Supplement section 423A.6.

701—104.4(423A) Sale of business. A retailer subject to the provisions of the Iowa Code relating to the hotel and motel tax who sells the business shall file a return within the month following the sale and pay all tax due. Any unpaid tax is due prior to the transfer of title of any personal property to the purchaser and, if unpaid, becomes delinquent one month after the sale.

A retailer discontinuing business shall maintain records for a period of three years from the date of discontinuing business unless a release from the provision is given in writing by the department.

This rule is intended to implement Iowa Code sections 422.51(2), 422.52, 423.31, and 423.33 and 2005 Iowa Code Supplement section 423A.6.

701—104.5(423A) Bankruptcy, insolvency or assignment for benefit of creditors. In cases of bankruptcy, insolvency or assignment for the benefit of creditors by the taxpayer, the taxpayer shall immediately file a return with the tax being due.

This rule is intended to implement Iowa Code section 423.31(6) and 2005 Iowa Code Supplement section 423A.6.

701—104.6(423A) Claim for refund of tax. Refunds of tax shall be made only to those who have actually paid the tax. A person or persons may designate the retailer to collect the tax as an agent for purposes of receiving a refund of tax. Anyone claiming a refund shall prepare the claim on the prescribed form furnished by the department.

A claim for refund shall be filed with the department within three years from the date the tax became due or one year from the date of payment, whichever is later, stating in detail the reasons and facts and, if necessary, attaching supporting documents on which the claim for refund is based. If the claim for refund is denied, and the person wishes to protest the denial, the department will consider a protest to be timely if filed no later than 60 days following the date of denial. See rule 701—7.8(17A).

This rule is intended to implement Iowa Code section 423.47 and 2005 Iowa Code Supplement section 423A.6.

[ARC 0251C, IAB 8/8/12, effective 9/12/12]

701—104.7(423A) Application of payments.

104.7(1) Partial payments. Since a combined hotel and motel tax and quarterly state sales tax return is utilized by the department, all payments received with the return will be applied to satisfy state sales tax and hotel and motel tax liabilities, which include penalty and interest. Application of partial payments received with the tax return and any subsequent partial payment received for that tax period will be applied based on a ratio formula, unless properly designated by the taxpayer as provided in Iowa Code section 421.60(2) “d.” The denominator in the ratio shall be the total of the hotel and motel tax due and the state sales tax due less any monthly sales tax deposits. The numerators in the ratio formula shall be the amounts of hotel and motel tax due and the net state sales tax due.

EXAMPLE: XYZ hotel owes a total of \$1,000 in net state sales tax and hotel and motel tax for the quarter. Of the \$1,000 owed, \$600 is for hotel and motel tax and \$400 is for state sales tax. XYZ files its quarterly sales tax return accompanied by a \$500 partial payment. The \$500 partial payment would be applied based on the following computation:

$$\frac{600}{1000} \times 500 = \$300 \text{ Hotel and motel tax}$$

$$\frac{400}{1000} \times 500 = \$200 \text{ State sales tax}$$

104.7(2) Locally imposed tax.

a. Generally. All revenues received under Iowa Code chapter 423A are to be credited to the “local transient guest tax fund.” Revenues include all interest and penalties applicable to any hotel and motel tax report or remittance, whether resulting from delinquencies or audits.

b. Termination by a city or county. All revenues received or moneys refunded 180 days after the date on which a city or county terminates its local hotel and motel tax shall be deposited in or withdrawn from the state general fund. The 180-day limitation applies to actual receipts or disbursements and not to accrued but unpaid tax liabilities or potential refunds.

c. Termination by a land use district. If a land use district terminates its local hotel and motel tax, lodging within the district becomes subject to any local hotel and motel tax imposed by a city or county within the corporate boundaries of that district on the date of termination. If a city or county imposes a local hotel and motel tax within the district, all revenues received from or moneys refunded to lodging within the district after the date on which the land use district terminates its local hotel and motel tax shall be treated as collected from or refunded to lodging in such city or county. If no city or county

imposes a local hotel and motel tax within the district, all revenues received from or moneys refunded to lodging within the district at least 180 days after the date on which the land use district terminates its local hotel and motel tax shall be deposited in or withdrawn from the state general fund as described in paragraph 104.7(2)“b.”

This rule is intended to implement Iowa Code section 423A.7.
[ARC 3750C, IAB 4/11/18, effective 5/16/18]

701—104.8(423A) Interest and penalty.

104.8(1) Penalties. See rule 701—10.6(421) for the calculation of penalty for tax periods beginning on or after January 1, 1991.

104.8(2) Interest. Tax not paid by the due date of the return shall draw interest at the rate described in rule 701—10.2(421). Payments made are first credited to penalty and interest due and then to the tax liability. See *Ashland Oil Co. v. Iowa Department of Revenue and Finance*, 452 N.W.2d 162 (Iowa 1990).

This rule is intended to implement Iowa Code section 423A.6.
[ARC 7761B, IAB 5/6/09, effective 6/10/09]

701—104.9(423A) Request for waiver of penalty. See rule 701—10.6(421) for the statutory provisions to penalty for tax periods beginning on or after January 1, 1991.

This rule is intended to implement Iowa Code section 423A.6.
[ARC 7761B, IAB 5/6/09, effective 6/10/09]

701—104.10(423A) Extension of time for filing. Upon a proper showing of the necessity for extending the due date, the director is authorized to grant an extension of time in which to file a return. The extension shall not be granted for a period longer than 30 days. The request for the extension must be received on or before the original due date of the return. It will be granted only if the person requesting the extension shall have paid by the twentieth day of the month following the close of such quarter, 90 percent of the estimated tax due.

This rule is intended to implement Iowa Code section 423.31 and 2005 Iowa Code Supplement section 423A.6.

701—104.11(421,423A) Personal liability of corporate officers and partners for unpaid tax. If a retailer fails to pay hotel or motel tax due, any officer of a corporation or association or any partner of a partnership who has control of, supervision of, or the authority for remitting the hotel or motel tax payments and has a substantial legal or equitable interest in the ownership of the corporation or partnership is personally liable for payment of the tax, interest, and penalty if the failure to pay the tax is intentional. The dissolution of a corporation, association, or partnership does not discharge a responsible person's liability for failure to pay tax. Rule 701—12.15(422,423) describes this liability in more detail. The statements of the rule are made with reference to sales tax, but are also applicable to personal liability for hotel and motel tax.

This rule is intended to implement Iowa Code section 421.26 and 2005 Iowa Code Supplement chapter 423A.

701—104.12(421,423A) Good faith exception for successor liability. For taxes due and unpaid, an immediate successor's liability for unpaid hotel and motel tax is extinguished if the immediate successor can show that its purchase of the business owing the tax was done “in good faith.” See rule 701—12.14(422,423) for a detailed analysis of immediate successor liability and the “good faith” exception to that liability.

This rule is intended to implement Iowa Code section 421.28 and 2005 Iowa Code Supplement chapter 423A.

[Filed 5/11/79, Notice 4/4/79—published 5/30/79, effective 7/5/79]

[Filed 12/7/79, Notice 10/31/79—published 12/26/79, effective 1/30/80]

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[Filed ARC 0251C (Notice ARC 0145C, IAB 5/30/12), IAB 8/8/12, effective 9/12/12]
[Filed ARC 3750C (Notice ARC 3566C, IAB 1/17/18), IAB 4/11/18, effective 5/16/18]

CHAPTER 105
LOCALLY IMPOSED HOTEL AND MOTEL TAX
[Prior to 12/17/86, Revenue Department[730]]

701—105.1(423A) Local option. A city may impose, by ordinance of the city council, a hotel and motel tax within the corporate boundaries of that city. A county may impose, by resolution of the board of supervisors, a hotel and motel tax outside incorporated areas within the county. A land use district may impose, by ordinance of the board of trustees, a hotel and motel tax within the corporate boundaries of that district. A city or county cannot impose its hotel and motel tax within the corporate boundaries of a land use district during any period when the land use district imposes a hotel and motel tax. A city, county, or land use district can impose the tax only after an election at which a majority of those voting on the question favors imposition.

This rule is intended to implement Iowa Code section 423A.4 as amended by 2017 Iowa Acts, House File 609.

[ARC 3750C, IAB 4/11/18, effective 5/16/18]

701—105.2(423A) Tax rate. The hotel and motel tax rate cannot exceed 7 percent and must be imposed in increments of one or more full percentage points. If a jurisdiction seeks to impose, repeal or change the tax rate, the jurisdiction must hold an election. Within ten days of an election favoring the imposition of the tax, repeal of the tax or change in the tax rate, the county auditor must notify the director in writing of the favorable vote by sending a copy of the abstract of votes from the favorable election to the director.

This rule is intended to implement 2005 Iowa Code Supplement section 423A.4.

701—105.3(423A) Tax base. The hotel and motel tax is imposed upon the sales price from the renting of any and all lodging in a facility covered by Iowa Code chapter 423A. The sales price from renting includes any direct or indirect charge for the rooms.

105.3(1) The tax shall not apply: (a) when lodging is furnished to a person if that person rents any rooms or other lodging for more than 31 consecutive days, (b) to the renting of sleeping rooms in dormitories and in memorial unions at all universities and colleges located in the state, (c) to contracts made directly with the federal government, or (d) to the renting of a room to the guest of a religious institution upon real property exempt from tax as the property of a religious institution, if the reason for renting the room is to provide a place for a religious retreat or function and not a place for transient guests generally.

105.3(2) The tax base shall include the entire cost directly or indirectly related to the renting of lodging. If a person is charged for items other than “rent” in connection with the renting of lodging (e.g., food, telephone, laundry or recreation facility use), such charges must be stated separately or the entire charge will be considered “rent.”

This rule is intended to implement 2005 Iowa Code Supplement section 423A.4.

701—105.4(423A) Imposition dates. A local hotel and motel tax shall be imposed on January 1 or July 1 following the notification to the director of revenue. Once imposed, the tax shall remain in effect at the rate imposed for a minimum of one year. See rule 701—103.14(423A) regarding notification.

This rule is intended to implement 2005 Iowa Code Supplement section 423A.4.

701—105.5(423A) Adding or absorbing tax. It is unlawful for any retailer responsible for collecting and remitting the hotel and motel tax to advertise or hold out, or state to the public or to any person, that the tax imposed will be assumed or absorbed by the retailer, or that the tax will not be considered as an element in the price to the public or the person renting a facility subject to the hotel-motel tax. When a retailer advertises in a manner so that it may be readily seen and read by the public that the price “includes tax,” the retailer may charge a lump sum for renting the facility without making a separate charge for the tax. It is the responsibility of the retailer to provide proof that the retailer has complied with the method of advertising or displaying the price.

This rule is intended to implement Iowa Code sections 423.24 and 423A.6.

701—105.6(423A) Termination dates. A local hotel and motel tax may be terminated only on June 30 or December 31. See rule 701—103.13(423A) regarding notification.

This rule is intended to implement Iowa Code Supplement section 423A.4.

[Filed 5/11/79, Notice 4/4/79—published 5/30/79, effective 7/5/79]

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CHAPTER 71
ADMINISTRATION OF THE CONVEYANCE SAFETY PROGRAM

875—71.1(89A) Definitions. The definitions contained in this rule shall apply to 875—Chapters 71, 72, and 73.

“*Acceptance checklist*” means a checklist available on the website of the division of labor services that includes a list of major systems and components of conveyances.

“*AECO*” means an elevator/escalator certification organization accredited pursuant to ASME A17.7.

“*Approved*” means approved by the division.

“*CCD*” means code compliance documentation as described in ASME A17.7, Section 2.10.

“*CEI*” means a person who is a certified elevator inspector or certified elevator inspector supervisor and who received the certification from a certifying organization that holds a valid document of accreditation issued by an accreditation body in accordance with ANSI/ISO/IEC 17024.

“*Control*” means the system governing the starting, stopping, direction of motion, acceleration, speed and deceleration of the moving member.

“*Conveyance*” means any elevator, escalator, material lift elevator installed on or after August 10, 2016, dumbwaiter, wind tower lift, CPH, or other equipment governed by Iowa Code chapter 89A.

“*CPH*” means a construction personnel hoist.

“*CPH jump*” means the addition or removal of mast or tower allowing a change in the hoist service elevation of a CPH.

“*Division*” means the labor services division of the workforce development department.

“*Elevator*” means a hoisting and lowering mechanism equipped with a car or platform which moves in guides in a substantially vertical direction and which serves two or more floors of a building or structure. “Elevator” does not include a CPH.

“*Elevator mechanic*” means a person who meets the standard for “elevator personnel” found in ASME A17.1.

“*Hoistway-unit system*” means a series of hoistway-door interlocks, hoistway-door electric contacts or hoistway-door combination mechanical locks and electric contacts, or a combination thereof, the function of which is to prevent operation of the driving machine by the normal operating device unless all hoistway doors are in the closed position and, if required, locked.

“*Wind tower lift*” means a conveyance designed and utilized solely for movement of trained and authorized people and small loads in wind towers built for the production of electricity.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 9221B, IAB 11/17/10, effective 12/22/10; ARC 0168C, IAB 6/13/12, effective 7/18/12; ARC 0685C, IAB 4/17/13, effective 5/22/13; ARC 1159C, IAB 10/30/13, effective 12/4/13; ARC 2603C, IAB 7/6/16, effective 8/10/16]

875—71.2(89A) Registration of conveyances. The owner or authorized agent of each operable conveyance not previously registered shall register the conveyance. An application to install a new conveyance shall constitute registration. All registrations shall be submitted to the commissioner on forms available from the division of labor services and shall include all information requested by the labor commissioner.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.3(89A) State identification number. The commissioner shall assign an identification number to each conveyance that shall be stamped on a metal tag permanently attached to the controller, to the electrical disconnecting switch, or in a wind tower lift cage.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.4(89A) Responsibility for obtaining permits. The procuring of all permits and the payment of all fees required by this chapter shall be the responsibility of the owner. Failure to obtain the appropriate permit prior to installation, alteration or operation may, at the discretion of the labor commissioner, result in a referral to the attorney general for prosecution of criminal penalties as described in Iowa Code section 89A.17.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.5(89A) Installation permits.

71.5(1) Installation shall not begin until an installation permit has been issued by the division. A separate installation permit shall be issued for each conveyance, except that a single installation permit shall cover all identical wind tower lifts installed as the result of one construction contract in identical wind towers in a single wind farm.

71.5(2) Application for an installation permit shall be accompanied by the fee specified in rule 875—71.16(89A), shall be in the format required by the labor commissioner, and shall include the following, as applicable:

- a.* Sectional plan of car and hoistway.
- b.* Sectional plan of machine room.
- c.* Sectional elevation of hoistway and machine room including the pit, bottom and top clearance of car and counterweights.
- d.* Size and weight of rails and guide rail bracket spacing.
- e.* The estimated maximum vertical forces on the guide rails on application of the safety device.
- f.* In the case of freight elevators for class B or class C loading, the horizontal forces on the guide rail faces during loading and unloading and the estimated maximum horizontal forces in a post-wise direction on the guide rail faces on the application of the safety device.
- g.* The size and weight per foot of any rail reinforcements where rail reinforcements are provided.
- h.* Job specifications.
- i.* For a conveyance covered by ASME A17.7, a complete copy of the CCD with attachments and a complete copy of the Certificate of Conformance with attachments as described by ASME A17.7, Appendix I, Section 4.5.
- j.* For a CPH, the number of CPH jumps planned, the planned dates for each CPH jump, and the change in the number of floors anticipated with each CPH jump.

71.5(3) A CPH installation permit issued in response to an application submitted in full compliance with this subrule permits each planned CPH jump. Each CPH jump shall be considered an alteration. The fee submitted for a CPH installation permit shall be the total of the CPH installation permit fee as set forth in subrule 71.16(3) and the CPH alteration permit fee as set forth in subrule 71.16(4).

71.5(4) Issuance of an installation permit shall not be construed as a waiver or variance of any requirement of law.

71.5(5) The installation permit or a copy of the installation permit shall be conspicuously posted at the worksite. All the wind towers covered by a single installation permit shall be considered a single worksite, and posting one copy of the installation permit at the construction project office shall be sufficient compliance with this subrule.

71.5(6) Except as described in paragraphs 71.5(6) “a” and “b,” the installation permit shall expire upon the earlier of the completion of the installation as described in the permit application or one year after issuance.

- a.* For a CPH, the installation permit shall expire upon completion of the last CPH jump.
- b.* For any conveyance, during the tenth month after issuance, and upon submission to the labor commissioner of sufficient justification, the fee established by this chapter, and other required information, an extension may be granted at the discretion of the labor commissioner.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 9221B, IAB 11/17/10, effective 12/22/10]

875—71.6(89A) Construction permits. A construction permit authorizes the temporary, limited use of an elevator for purposes relating to construction or demolition.

71.6(1) Use of the elevator shall not begin until a construction permit has been issued by the division.

71.6(2) Application for a construction permit shall be in the format required by the labor commissioner and must include all the information requested by the labor commissioner and the fee specified by this chapter.

71.6(3) Upon submission of the completed application and fee, a state inspector shall be scheduled to inspect the elevator. Construction permits shall be issued only if the following criteria are met:

a. The elevator has been successfully tested pursuant to the requirements of ASME A17.1, Section 8.11.5.13; and

b. The applicable requirements of ASME A17.1, Section 5.10, are met.

71.6(4) The construction permit or a copy of the construction permit shall be posted conspicuously in a protective sleeve in the elevator car.

71.6(5) The construction permit shall expire 120 days after issuance. However, between 90 and 110 days after issuance and upon submission to the labor commissioner of sufficient justification, the fee established by this chapter, and other required information, an extension of up to 90 days may be granted at the discretion of the labor commissioner.

71.6(6) Elevators with a construction permit but without an operating permit shall not be accessible to the general public.

71.6(7) Failure to comply with these provisions may result in the revocation of the construction permit.

71.6(8) An operating permit shall not be issued before construction and an acceptance inspection are complete.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.7(89A) Operating permits.

71.7(1) Operation of equipment covered by this chapter without a current operating permit is prohibited, except as authorized by rules 875—71.6(89A), 875—71.8(89A), and 875—71.20(89A). If operation of a conveyance is prohibited under this rule, the labor commissioner may post notice on the conveyance that it is not to be used. The conveyance may be returned to service only after an operating permit for the conveyance has been issued or reissued.

71.7(2) Operating permits shall not be issued prior to successful completion of an inspection pursuant to rule 875—71.11(89A) and payment of all permit and inspection fees owed to the division.

71.7(3) Current operating permits or copies of current operating permits shall be conspicuously displayed as follows:

a. The operating permit for an elevator or CPH shall be posted in the car.

b. The operating permit for an escalator, dumbwaiter, wind tower lift, moving walk, or wheelchair lift shall be posted on or near the subject conveyance.

71.7(4) An operating permit shall expire 60 days after the first permit renewal inspection following the issuance of the operating permit, unless an earlier date is dictated by this rule.

71.7(5) An operating permit is automatically suspended when an alteration begins. The operating permit automatically resumes when the elevator passes an inspection pursuant to rule 875—71.11(89A).

71.7(6) An operating permit is automatically terminated when an imminent danger notice is posted on the conveyance.

71.7(7) Notwithstanding other provisions of this rule, at the discretion of the labor commissioner, a temporary operating permit may be issued for up to 30 days provided the inspection has been completed and no code violations were identified. Issuance of a temporary operating permit does not extend the expiration date of the conveyance's operating permit.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 0318C, IAB 9/5/12, effective 10/10/12; ARC 0574C, IAB 2/6/13, effective 3/13/13; ARC 0685C, IAB 4/17/13, effective 5/22/13]

875—71.8(89A) Controller upgrade permits. A controller upgrade permit may be issued to allow operation of an elevator while work to upgrade controls requires deactivation of the Phase I recall initiated by smoke sensing devices. Each elevator to be altered requires a separate controller upgrade permit. The duration of a controller upgrade permit shall not exceed 90 days. Each elevator in the group shall pass inspection pursuant to rule 875—71.11(89A) prior to being placed back into service.

71.8(1) A controller upgrade permit shall not be issued unless each of the following conditions is met:

a. Two or more elevators share a lobby at the level of the recall floor.

b. The project includes the installation of new elevator controllers in all of the elevators in the group.

c. Phase I fire recall initiated by a key-operated switch and all other controls shall be properly functioning for each elevator available for use.

d. There is a current alteration permit for the project.

e. A complete application for the controller upgrade permit and the fee established by this chapter have been submitted and accepted.

71.8(2) A controller upgrade permit shall not be construed to waive or excuse compliance with the requirements of any other governmental entity, including the department of public safety.

71.8(3) Upon the submission to the labor commissioner of sufficient justification, the fee established by this chapter, and other required information, an extension of the permit for up to 60 days may be granted.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.9(89A) Alteration permits.

71.9(1) Alteration shall not begin until an alteration permit has been issued by the division.

71.9(2) Application for an alteration permit shall be in the format required by the labor commissioner and shall include drawings and specifications of all planned changes and the fee specified by rule 875—71.16(89A).

71.9(3) Issuance of an alteration permit shall not be construed as a waiver or variance of any requirement of law.

71.9(4) The alteration permit or a copy of the alteration permit shall be conspicuously posted at the worksite.

71.9(5) If a complete installation permit application was submitted for a CPH pursuant to subrule 71.5(3), at least seven days' advance notice of each CPH jump shall be provided to the labor commissioner.

71.9(6) The alteration permit shall expire upon the earlier of the completion of the alteration as described in the permit application or one year after issuance. However, during the tenth month after issuance and upon submission to the labor commissioner of the fee set forth in this chapter, sufficient justification, and other required information, the labor commissioner may grant an extension of the alteration permit.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 9221B, IAB 11/17/10, effective 12/22/10; ARC 0685C, IAB 4/17/13, effective 5/22/13; ARC 2333C, IAB 1/6/16, effective 2/10/16]

875—71.10(89A) Alterations.

71.10(1) Alterations or changes shall comply with rule 875—72.13(89A) or rule 875—73.8(89A), as applicable.

71.10(2) A conveyance that is relocated shall be brought into compliance with all codes that are applicable at the time of relocation.

71.10(3) Alterations of conveyances other than escalators and elevators shall require that the entire conveyance be brought into compliance with the current code.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 0168C, IAB 6/13/12, effective 7/18/12; ARC 0685C, IAB 4/17/13, effective 5/22/13; ARC 2396C, IAB 2/17/16, effective 3/23/16]

875—71.11(89A) Inspections. Pursuant to Iowa Code section 89A.12, inspections by the labor commissioner's designee shall be permitted at reasonable times with or without prior notice.

71.11(1) Scope of inspections.

a. *Comprehensive.* Periodic inspections shall be comprehensive. Elevators being transferred from construction permits to operating permits, previously dormant conveyances being returned to service, relocated conveyances, and new conveyances shall be inspected in their entirety prior to operation.

b. *Limited.* The scope of an inspection after an alteration shall be determined by rule 875—72.13(89A) or 875—73.8(89A), as applicable. However, if the inspector notices a safety hazard in plain view outside the altered components, or if the periodic inspection is due, the entire conveyance shall be inspected.

71.11(2) When inspections will occur. When the timing of two different types of inspection on a single conveyance coincide, a state inspector may perform both inspections in one visit.

a. Periodic inspections.

(1) Each construction elevator and CPH shall be inspected at intervals not to exceed three months. All other periodic conveyance inspections by state inspectors shall be conducted annually unless the labor commissioner determines resources do not allow annual inspections. If the labor commissioner determines quarterly inspections of construction elevators and CPHs and annual inspections of other state-inspected conveyances are not feasible due to insufficient resources, the labor commissioner shall determine the inspection schedule.

(2) Conveyance inspections by special inspectors shall be conducted at least annually.

(3) The inspector shall arrange to perform the periodic inspection of a broadcast tower elevator when the maintenance company is on site to perform the periodic tests. If the inspection is to be performed by employees of the commissioner, the inspection shall occur during the division's normal business hours, unless otherwise agreed to by the commissioner pursuant to subrule 71.16(11).

b. Acceptance inspections. A CPH shall be inspected pursuant to the schedule in ANSI A10.4 – 2007, Chapter 26. For all other conveyances, an acceptance inspection shall occur:

(1) After each relocation,

(2) After each alteration,

(3) For a new installation, not less than two business days after a completed acceptance checklist is submitted by the conveyance installation company,

(4) Before an elevator subject to a construction permit receives an operating permit, and

(5) Before a previously dormant conveyance is returned to service.

c. Other inspections. Inspections may be made when the commissioner reasonably believes that a conveyance is not in compliance with the rules. Accidents, complaints, or requests for consultative inspections may result in inspections by the labor commissioner's designee.

71.11(3) Who may perform inspections.

a. The labor commissioner's designee shall inspect altered conveyances, construction elevators, CPHs, previously dormant conveyances being returned to service, relocated conveyances, and new conveyances.

b. Except as noted in 71.11(3)“c,” annual inspections may be performed by state inspectors or special inspectors authorized by the labor commissioner pursuant to rule 875—71.12(89A).

c. An inspection report by a special inspector shall not be accepted as the required, annual inspection if the conveyance is under contract for maintenance, installation or alteration by the special inspector or the special inspector's employer, or if the property is owned or leased by the special inspector or the special inspector's employer.

71.11(4) Inspection standards. Inspections shall be performed in accordance with applicable safety codes or documents such as:

a. CCD;

b. ASME A17.1, Sections 8.10 and 8.11, except Section 8.11.1.1;

c. ANSI A10.4-2007; or

d. ASME A18.1.

71.11(5) Inspection reports.

a. All inspectors shall file inspection reports on forms approved by the commissioner within 30 days from the date of inspection and shall provide owners of conveyances with copies of completed inspection reports. The inspection report must separately list each unsafe condition and the applicable, specific code citation. Up to 30 days shall be allowed for correction of the unsafe conditions.

b. The owner may file a petition for reconsideration of an inspection report pursuant to 875—Chapter 69. The timely and proper filing of a petition for reconsideration extends the deadline for correction of the hazards that are subject to the petition for reconsideration.

71.11(6) Extension of time. The owner may petition the commissioner for up to 60 additional days to make the necessary corrections. The time frames set forth in subrule 71.11(7) may be adjusted by the labor commissioner as necessary to accommodate an extension of time.

71.11(7) Correction of unsafe conditions. In the absence of a determination on reconsideration or appeal that correction of hazards is not required, all unsafe conditions identified in the inspection report

shall be corrected. The labor commissioner shall verify correction of all unsafe conditions identified in the inspection report by sending a state inspector to reinspect the conveyance for the fee set forth in rule 875—71.16(89A), or by reviewing appropriate documentation such as a photograph, invoice, other verifiable document, or subsequent inspection report. The time frames set forth in this subrule may be accelerated at the request of the owner.

a. Promptly upon receipt of an inspection report listing unsafe conditions, the labor commissioner will send to the owner and the special inspector, if any, an abatement order. A copy of the inspection report shall be attached to the abatement order. Unless a special inspector conducted the inspection, the order may specify a period that ends no more than 45 days after the inspection during which the owner may submit written evidence that the unsafe conditions have been corrected. The abatement order shall:

- (1) Identify the equipment.
- (2) Demand that the unsafe conditions be corrected within the period set forth in the inspection report.
- (3) Set forth the consequences of failure to comply.

b. After the period specified on the inspection report has passed, the labor commissioner may cause a state inspector to verify correction of all unsafe conditions. If reinspection reveals no significant progress toward correcting the unsafe conditions, or the remaining unsafe conditions create significant safety concerns, the labor commissioner may serve a notice of intent to suspend, deny or revoke the operating permit.

c. The labor commissioner may issue an operating permit after receipt of the appropriate fee and verification that each unsafe condition identified in the inspection report has been corrected.

d. If written proof of correction was requested in the abatement order, but adequate proof was not received by the deadline set forth in the abatement order, the labor commissioner may send a second abatement order or cause a state inspector to inspect the conveyance. If the labor commissioner elects to send a second abatement order, it shall notify the owner that, if written proof of abatement is not received within 20 days, a state inspector may be sent to the site. Copies of the abatement order and the inspection report shall be attached to the second abatement order.

e. If a special inspector conducted the inspection, more than 45 days have passed since the deadline for correction of hazards, and an inspection report indicating the hazards are corrected has not been filed, the labor commissioner may contact the special inspector, send a second abatement order to the owner, or send a state inspector to inspect the conveyance. Copies of the abatement order and the inspection report shall be attached to a second abatement order.

f. If an inspection as described in paragraph 71.11(7) “*d*” or “*e*” reveals no significant progress toward correcting the unsafe conditions, and the remaining unsafe conditions create no significant safety concerns, the labor commissioner may extend the time for abatement of the unsafe conditions an additional 10 days or may serve a notice of intent to suspend, deny or revoke the operating permit. The labor commissioner may also post a notice prohibiting use of the conveyance pending abatement of the unsafe conditions listed in the inspection report.

g. Procedures for appeal of a notice of intent to suspend, deny or revoke an operating permit are set forth in 875—Chapter 69.

71.11(8) *Imminent danger.* If the labor commissioner determines that continued operation of a conveyance pending correction of unsafe conditions creates an imminent danger, the labor commissioner shall post notice on the conveyance that it is not to be used pending repairs. Use of a conveyance contrary to posted notice by the labor commissioner may result in additional legal proceedings pursuant to Iowa Code section 89A.10(3) or 89A.18. The conveyance may be returned to service only after the imminent danger has been corrected and the conveyance has passed a comprehensive inspection.

71.11(9) *Interference prohibited.* No person shall interfere with, delay or impede an inspector employed by the state during an inspection.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 9221B, IAB 11/17/10, effective 12/22/10; ARC 0168C, IAB 6/13/12, effective 7/18/12; ARC 0685C, IAB 4/17/13, effective 5/22/13; ARC 1971C, IAB 4/29/15, effective 6/3/15; ARC 2607C, IAB 7/6/16, effective 8/10/16; ARC 3742C, IAB 4/11/18, effective 5/16/18]

875—71.12(89A,252J,261,272D) Special inspector commissions.

71.12(1) Definition. As used in this rule, “certificate of noncompliance” means:

- a. A certificate of noncompliance issued by the child support recovery unit, department of human services, pursuant to Iowa Code chapter 252J;
- b. A certificate of noncompliance issued by the college student aid commission pursuant to Iowa Code chapter 261; or
- c. A certificate of noncompliance issued by the centralized collection unit of the department of revenue pursuant to Iowa Code chapter 272D.

71.12(2) Qualifications.

- a. Each applicant must possess a high school diploma or general equivalency degree.
- b. Each applicant shall have at least three years of full-time work experience in the construction, installation, repair or inspection of conveyances.
- c. Each applicant shall be a CEI.
- d. Each applicant shall satisfactorily pass a division of labor services examination on Iowa procedures, Iowa policies, and all safety standards adopted by reference.
- e. Each applicant shall submit proof of insurance coverage insuring the applicant against liability for injury or death for any act or omission on the part of the applicant. The insurance policy shall be in an amount of not less than \$1,000,000 for bodily injury to or death of one person in any one accident, and in an amount of not less than \$5,000,000 for bodily injury to or death of two or more persons in any one accident, and in an amount of not less than \$100,000 for damage to or destruction of property in any one accident. The insurance coverage of the special inspector’s employer shall be considered to comply with this requirement if the coverage provides equivalent coverage for each special inspector.

71.12(3) Application. An applicant for a commission shall complete, sign, and submit to the division the form provided by the division with the required fee. The applicant shall include with the application proof that the applicant is a CEI.

71.12(4) Expiration. The commission expires when the commission is suspended or revoked by the labor commissioner or one year from issuance, whichever occurs earlier.

71.12(5) Changes. The special inspector shall notify the division at the time any of the information on the form or attachments changes.

71.12(6) Denials. The labor commissioner may refuse to issue or renew a special inspector’s commission for failure of the applicant to complete an application package, if the applicant is not a CEI, or for any reason listed in subrules 71.12(8) to 71.12(10).

71.12(7) Investigations. The labor commissioner may investigate for any reasonable cause related to special inspectors or special inspector applicants. The labor commissioner may conduct interviews and utilize other reasonable investigatory techniques. Investigations may be conducted without prior notice at the times and in the places the labor commissioner directs. The labor commissioner may notify the organization that certified the special inspector as a CEI of the findings of an investigation.

71.12(8) Reasons for probation. The labor commissioner may issue a notice of commission probation when an investigation reasonably reveals that the special inspector filed inaccurate reports.

71.12(9) Reasons for suspension. The labor commissioner may issue a notice of commission suspension when an investigation reasonably reveals any of the following:

- a. The special inspector failed to submit and report inspections on a timely basis;
- b. The special inspector abused the special inspector’s authority;
- c. The special inspector misrepresented self as a state inspector or a state employee;
- d. The special inspector used commission authority for inappropriate personal gain;
- e. The special inspector failed to follow the division’s rules for inspection of object repairs, alterations, construction, installation, or in-service inspection;
- f. The special inspector committed numerous violations as described in subrule 71.12(8);
- g. The special inspector used fraud or deception to obtain or retain, or to attempt to obtain or retain, a special inspector commission whether for one’s self or another;
- h. The special inspector is no longer a CEI;
- i. The division received a certificate of noncompliance; or

j. The special inspector failed to take appropriate disciplinary actions against a subordinate special inspector who has committed repeated acts or omissions listed in paragraphs 71.12(9) “a” to “h.”

71.12(10) *Reasons for revocation.* The labor commissioner may issue a notice of revocation of a special inspector’s commission when an investigation reveals any of the following:

- a.* The special inspector filed a misleading, false or fraudulent report;
- b.* The special inspector failed to perform a required inspection;
- c.* The special inspector failed to file a report or filed a report which was not in accordance with the provisions of applicable standards;
- d.* The special inspector committed repeated violations as described in subrule 71.12(9);
- e.* The special inspector used fraud or deception to obtain or retain, or to attempt to obtain or retain, a special inspector commission whether for one’s self or another;
- f.* The special inspector instructed, ordered, or otherwise encouraged a subordinate special inspector to perform the acts or omissions listed in paragraphs 71.12(10) “a” to “e”;
- g.* The special inspector is no longer a CEI; or
- h.* The division received a certificate of noncompliance.

71.12(11) *Procedures.* The following procedures shall apply except in the event of revocation or suspension due to receipt of a certificate of noncompliance. In instances involving receipt of a certificate of noncompliance, the applicable procedures of Iowa Code chapter 252J, 261, or 272D shall apply.

a. Notice of actions. The labor commissioner shall serve a notice on the special inspector by certified mail to an address listed on the commission application form or by other service as permitted by Iowa Code chapter 17A.

b. Contested cases. The special inspector shall have 20 days to file a written notice of contest with the labor commissioner. If the special inspector does not file a written contest within 20 days of receipt of the notice, the action stated in the notice shall automatically be effective.

c. Hearing procedures. The hearing procedures in 875—Chapter 1 shall govern.

d. Emergency suspension. Pursuant to Iowa Code section 17A.18A, if the labor commissioner finds that the public health, safety or welfare imperatively requires emergency action because a special inspector failed to comply with applicable laws or rules, the special inspector’s commission may be summarily suspended.

e. Probation period. A special inspector may be placed on probation for a period not to exceed one year for each incident causing probation.

f. Suspension period. A special inspector’s commission may be suspended up to five years for each incident causing a suspension.

g. Revocation period. A special inspector’s commission that has been revoked shall not be reinstated for five years.

h. Concurrent actions. Multiple actions may proceed at the same time against any special inspector.

i. Revoked or suspended commissions. Within five business days of final agency action revoking or suspending a special inspector commission, the special inspector shall surrender the special inspector’s commission card to the labor commissioner. The labor commissioner may notify the special inspector’s employer and the organization that certified the special inspector as a CEI of a revocation or suspension. [ARC 7841B, IAB 6/17/09, effective 7/22/09]

875—71.13(89A) State employees. Rescinded ARC 1971C, IAB 4/29/15, effective 6/3/15.

875—71.14(89A) Safety tests. Only safety test reports submitted on approved forms from elevator mechanics who are employed by authorized companies shall be considered to meet the requirements of this rule. The alternative test methods set forth at ASME A17.1, Rule 8.6.11.10, shall not be allowed as a substitute for a full-load safety test.

71.14(1) *When safety tests will be performed.*

- a.* Safety tests shall be performed on new and altered installations before they are placed in service.

b. Category 1 safety tests of wind turbine tower elevators shall be conducted after two years of operation, and category 5 safety tests of wind turbine tower elevators shall be performed after ten years of operation. Safety tests shall be made on all other conveyances pursuant to the schedules and procedures set forth in:

- (1) The maintenance control plan for wind tower lifts exempted from ASME A17.1 by rule 875—72.12(89A);
- (2) The CCD for conveyances covered by ASME A17.7-2007/CSA B44-07;
- (3) The columns pertaining to “periodic tests” in Table N-1 in the edition of ASME A17.1 currently adopted for new conveyances at rule 875—72.1(89A);
- (4) ASME A18.1(2003), Part 10; or
- (5) ANSI A10.4-2007, Section 26.4.

71.14(2) *How safety tests will be reported.* Within 30 days after completion of a safety test, the elevator mechanic shall file with the labor commissioner a report on an approved form and shall provide a copy of the form to the owner and to the witness, if applicable.

71.14(3) *How safety tests will be recorded.* The elevator mechanic shall attach a tag showing the date of the test, the elevator mechanic’s name, and the type of test performed.

a. On electric traction elevators, the elevator mechanic shall attach the tag to the safety-releasing carrier.

b. On hydraulic elevators, the elevator mechanic shall attach the tag to the disconnecting switch or the controller.

c. On wheelchair lifts, the elevator mechanic shall attach the tag to the disconnecting switch.

d. On other conveyances covered by these rules, the commissioner’s designee witnessing the acceptance safety test shall indicate the proper location of the tag. Subsequent test tags shall be attached in the same location.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 9221B, IAB 11/17/10, effective 12/22/10; ARC 0168C, IAB 6/13/12, effective 7/18/12; ARC 1766C, IAB 12/10/14, effective 1/14/15; ARC 3742C, IAB 4/11/18, effective 5/16/18]

875—71.15(89A) Authorized companies.

71.15(1) Each year, authorized companies shall train their elevator mechanics who perform safety tests on safety test procedures.

71.15(2) For each conveyance owned by an authorized company, the owner shall obtain the services of a CEI who is not employed by the authorized company or an inspector employed by the state to witness the safety test.

71.15(3) To become authorized to perform safety tests, a company shall submit a copy of its procedures for performing safety tests. The labor commissioner shall review the procedures for adequacy and shall request modifications to the procedures or grant or deny the authorization.

71.15(4) Every five years or within six months after the board adopts a new edition of ASME, whichever is earlier, authorized companies shall submit revised safety test procedures for renewal of authorization. The labor commissioner shall review the procedures for adequacy and shall request modifications to the procedures or grant or deny the authorization.

71.15(5) Investigations. Investigations shall take place at the times and in the places the labor commissioner directs. The labor commissioner may investigate for any reasonable cause. The labor commissioner may conduct interviews and utilize other reasonable investigatory techniques. Investigations may be conducted without prior notice.

71.15(6) Suspension. If the labor commissioner determines that a falsified safety test report was submitted by an elevator mechanic, the labor commissioner shall suspend the authorization of the elevator mechanic’s employer for six months. During the suspension, all safety tests performed by any employee of the authorized company shall be witnessed by a state inspector or a CEI who is not employed by the suspended authorized company.

71.15(7) Suspension procedures.

a. The labor commissioner shall notify an authorized company of its suspension by certified mail or by other service as permitted by Iowa Code chapter 17A.

b. The authorized company shall have 20 days to file a written notice of contest with the labor commissioner. If the authorized company does not file a written notice of contest in a timely manner, the suspension shall automatically be effective. If the authorized company does file a written notice of contest in a timely manner, the hearing procedures in 875—Chapter 1 shall govern.

c. If the labor commissioner finds, pursuant to Iowa Code section 17A.18A, that public health, safety or welfare imperatively requires emergency action, the authorization may be summarily suspended.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.16(89A) Fees. Except as noted in this rule, all fees are nonrefundable and due in advance.

71.16(1) Operating permits. The annual operating permit fee shall be \$75 per conveyance.

71.16(2) Periodic inspections. Fees shall be remitted to the division of labor services within 30 days of the date of inspection. The fees for periodic inspections shall be as follows:

- a. Construction elevator: \$200.
- b. Wind tower lift: \$225.
- c. Hand-powered elevator: \$90.
- d. Television tower elevator: \$500.
- e. Handicapped restricted use elevator: \$100.
- f. Other hydraulic elevator: \$100.
- g. Other traction elevator: \$150.
- h. Escalator: \$150.
- i. Dumbwaiter: \$90.
- j. Wheelchair lift: \$90.
- k. CPH.
- (1) Annual: \$500.
- (2) Quarterly: \$200.
- l. Moving walk: \$150.

71.16(3) Installation permits. The fees in this subrule cover the initial print review, installation permit, initial inspection and first-year operating permit. Each print revision submitted to the division shall be subject to an additional fee of \$100. The fees for new installations shall be as follows:

- a. Wind tower lift: \$500.
- b. Material lift elevators: \$500.
- c. Other hydraulic elevators: \$750.
- d. Other traction elevators: \$1000.
- e. Escalator: \$1000.
- f. Dumbwaiter: \$500.
- g. Wheelchair lift: \$500.
- h. CPH: \$500.
- i. Moving walk: \$500.

71.16(4) Alteration permits.

a. The fee for any elevator alteration permit shall be \$500 and shall cover the initial print review, alteration permit, and initial inspection.

b. The fee for each CPH extension shall be \$150. The total fee required for all planned CPH extensions shall be submitted with the installation permit application pursuant to subrule 71.5(3).

c. The fee for an alteration permit shall be \$500 if the only alteration is the addition or replacement of an escalator skirt brush.

d. For all other conveyances, the fees for new installations shall apply to alterations.

71.16(5) Construction permits. The construction permit fee shall be \$200 per conveyance. This fee includes the fee for initial inspection.

71.16(6) Controller upgrade permits. The controller upgrade permit fee shall be \$250. This fee includes one inspection.

71.16(7) Consultative inspections. Consultative inspections may be performed at the discretion of the labor commissioner for \$125 per hour, including travel time, with a minimum charge of \$250.

71.16(8) Special inspector commission. The special inspector commission fee shall be \$60 annually.

71.16(9) Witness of safety tests. The fee for division employees to witness safety tests shall be \$125 per hour, including travel time, with a minimum charge of \$250.

71.16(10) Permit extensions. The fee to extend an installation permit, alteration permit, or construction permit shall be \$100.

71.16(11) Inspections outside of normal business hours. Inspections outside the normal business hours may be performed at the discretion of the labor commissioner. If the owner or contractor requests an inspection outside of normal business hours and the labor commissioner agrees to the schedule, an additional fee will be charged. The additional fee will be calculated at a rate of \$200 per hour, including travel time, with a minimum charge of \$400.

71.16(12) Reinspections. The fees for reinspections are \$400 for television tower elevators and CPHs, \$200 for wind tower lifts, and \$300 for all other conveyances.

71.16(13) Inspection for temporary removal from service. The inspection fee for temporary removal from service pursuant to rule 875—71.20(89A) shall be \$125 per hour, including travel time, with a minimum charge of \$250.

71.16(14) Fee waiver.

a. When a state inspector combines in one visit two different types of inspection on a single conveyance, the commissioner may waive the lesser of the fees.

b. The fee for an alteration permit shall be waived by the commissioner if the only alterations covered by the permit application are required by rule 875—72.26(89A) or 875—73.27(89A). The fee waiver set forth in this paragraph does not eliminate the requirement to pay for an acceptance inspection or for an operating permit.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 9221B, IAB 11/17/10, effective 12/22/10; ARC 0318C, IAB 9/5/12, effective 10/10/12; ARC 0685C, IAB 4/17/13, effective 5/22/13; ARC 1158C, IAB 10/30/13, effective 12/4/13; ARC 1972C, IAB 4/29/15, effective 6/3/15; ARC 1971C, IAB 4/29/15, effective 6/3/15; ARC 2603C, IAB 7/6/16, effective 8/10/16]

875—71.17(89A) Publications available for review. Standards, codes, and publications adopted by reference in these rules are available for review in the office of the Division of Labor Services, 1000 E. Grand Avenue, Des Moines, Iowa 50319.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.18(89A) Other regulations affecting elevators. Regulations concerning accessibility of buildings and conveyances available to the public are found at 661—Chapter 302. Regulations governing the safety and health of employees who work in and around elevators are found at 875—Chapters 2 to 26. Iowa Code chapter 91C and 875—Chapter 150 apply to companies that alter and install conveyances. No rule in 875—Chapters 71 to 73 shall be interpreted as creating an exemption, waiver, or variance from any otherwise applicable regulation or statute.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.19(89A) Accidents.

71.19(1) Reporting the accident. The owner shall immediately notify the commissioner of each personal injury accident requiring the service of a physician or causing disability exceeding one day or causing damage to the conveyance exceeding \$2,000. Notification shall be in writing and shall include the state identification number, owner, and description of accident.

71.19(2) Securing the accident site pending investigation. The removal of any part of the damaged conveyance or operating mechanism from the premises is forbidden until permission to do so is granted by the commissioner.

71.19(3) Putting the conveyance back into operation. When an accident involves the failure or destruction of any part of the conveyance or its operating mechanism, the use of the conveyance is forbidden until it has been made safe, until it has been reinspected, and until any repairs or alterations have been approved by the commissioner.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—71.20(89A) Temporary removal from service. The requirements for an annual inspection, annual inspection fee, safety test, operating permit, and operating permit fee shall be temporarily suspended for up to three years for an elevator in an unoccupied building if the requirements of this rule are met.

71.20(1) All elevator doors in unoccupied buildings shall be closed and locked. Hydraulic elevators shall be parked at the bottom of the hoistway. Traction elevators shall be parked at the top of the hoistway.

71.20(2) Upon request by the owner of an elevator in an unoccupied building, the labor commissioner shall send an inspector who is a state employee to confirm that the building is unoccupied and that the car and doors of the elevator have been properly secured. If the conditions set forth in subrule 71.20(1) are met, the inspector shall apply to the elevator a seal and a red tag marked with the words “Do Not Operate.”

71.20(3) One year after the inspection, the owner must file with the labor commissioner written confirmation that the status of the elevator and building have not changed, and the owner must file again two years after the inspection. Failure to comply with this requirement shall result in termination of the temporary suspension of the requirements for safety tests, inspections, and operating permits.

71.20(4) Prior to returning the elevator to service, and upon request of the owner, the labor commissioner may allow the elevator to be operated for 30 days for the sole purpose of performing safety tests and maintenance.

71.20(5) The owner must notify the labor commissioner at least two weeks before placing an elevator back into service and must arrange for an inspector who is a state employee to witness a safety test.

71.20(6) If at the end of three years the building is still unoccupied, suspension of the requirements for safety tests, inspections, and operating permits shall end without possibility of renewal.

[ARC 0318C, IAB 9/5/12, effective 10/10/12]

These rules are intended to implement Iowa Code chapters 89A, 252J, 261 and 272D.

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CHAPTER 72
CONVEYANCES INSTALLED ON OR AFTER JANUARY 1, 1975

[Prior to 9/24/86, Labor, Bureau of [530]]

[Prior to 10/21/98, see 347—Ch 72]

875—72.1(89A) Purpose and scope. This chapter contains safety standards covering the design, construction, installation, operation, inspection, testing, maintenance, alteration and repair of conveyances installed on or after January 1, 1975. The rules of this chapter also apply to previously dormant conveyances that are being reactivated, and to reinstalled or moved conveyances. As used in this rule, the word “installation” refers to the date on which a conveyance contractor enters into a contractual agreement pertaining to a conveyance.

72.1(1) For installations between January 1, 1975, and December 31, 1982, ANSI A17.1 shall mean ANSI A17.1 (1971).

72.1(2) For installations between January 1, 1983, and December 31, 1992:

- a. ANSI A17.1 shall mean ANSI A17.1 (1981); and
- b. ANSI A117.1 shall mean ANSI A117.1 (1980).

72.1(3) For installations between January 1, 1993, and December 31, 2000:

- a. ASME A17.1 shall mean ASME A17.1 (1990) and in addition shall mean the following:
 - (1) ASME A17.1b (1992), Rule 110.11h, for electric elevators installed between July 1, 1993, and December 31, 2000, and
 - (2) ASME A17.1b (1992), Rule 110.11h that is referenced by Rule 300.11, for hydraulic elevators installed between July 1, 1993, and December 31, 2000.

- b. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (1990); and
- c. ANSI A117.1 shall mean ANSI A117.1 (1980).

72.1(4) For installations between January 1, 2001, and December 31, 2003:

- a. ASME A17.1 shall mean ASME A17.1 (1996 through the 1999 addenda);
- b. ASME A18.1 shall mean ASME A18.1 (1999), except Chapters 4, 5, 6, and 7;
- c. ANSI A117.1 shall mean ANSI A117.1 (1998); and
- d. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (1999).

72.1(5) For installations between January 1, 2004, and April 4, 2006:

- a. ASME A17.1 shall mean ASME A17.1 (2000 through the 2003 addenda);
- b. ASME A18.1 shall mean ASME A18.1 (1999 through the 2001 addenda), except Chapters 4, 5, 6, and 7;
- c. ANSI A117.1 shall mean ANSI A117.1 (1998); and
- d. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2002).

72.1(6) For installations between April 5, 2006, and July 22, 2008:

- a. ASME A17.1 shall mean ASME A17.1-2004, A17.1a-2005 and A17.1S-2005;
- b. ASME A18.1 shall mean ASME A18.1 (2003), except Chapters 4, 5, 6, and 7;
- c. ANSI A117.1 shall mean ANSI A117.1 (2003), except for Rule 407.4.6.2.2; and
- d. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2005).

72.1(7) For installations between July 23, 2008, and July 18, 2012:

- a. ASME A17.1 shall mean ASME A17.1-2007/CSA B44-07;
- b. ASME A17.7 shall mean ASME A17.7-2007/CSA B44-07;
- c. ASME A18.1 shall mean ASME A18.1 (2003), except Chapters 4, 5, 6, and 7;
- d. ANSI A117.1 shall mean ANSI A117.1 (2003), except for Rule 407.4.6.2.2; and
- e. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2005).

72.1(8) For installations between July 19, 2012, and January 30, 2014:

- a. ASME A17.1 shall mean ASME A17.1-2010/CSA B44-10, except for Rule 2.27.1.1.6;
- b. ASME A17.7 shall mean ASME A17.7-2007/CSA B44-07;
- c. ASME A18.1 shall mean ASME A18.1 (2003), except Chapters 4, 5, 6, and 7;
- d. ANSI A117.1 shall mean ANSI A117.1 (2003), except for Rule 407.4.6.2.2; and
- e. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2008).

72.1(9) For installations between January 31, 2014, and January 14, 2015:

- a. ASME A17.1 shall mean ASME A17.1-2010/CSA B44-10, except for Rule 2.27.1.1.6;
- b. ASME A17.7 shall mean ASME A17.7-2007/CSA B44-07;
- c. ASME A18.1 shall mean ASME A18.1 (2011), except Chapters 4, 5, 6, and 7;
- d. ANSI A117.1 shall mean ANSI A117.1 (2003), except for Rule 407.4.6.2.2; and
- e. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2008).

72.1(10) For installations between January 14, 2015, and May 16, 2018:

- a. ASME A17.1 shall mean ASME A17.1-2013/CSA B44-13;
- b. ASME A17.7 shall mean ASME A17.7-2007/CSA B44-07;
- c. ASME A18.1 shall mean ASME A18.1 (2011), except Chapters 4, 5, 6, and 7;
- d. ANSI A117.1 shall mean ANSI A117.1 (2003), except for Rule 407.4.6.2.2; and
- e. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2011).

72.1(11) For installations on or after May 16, 2018:

- a. ASME A17.1 shall mean ASME A17.1-2016/CSA B44-16;
- b. ASME A17.7 shall mean ASME A17.7-2012/CSA B44.7-12;
- c. ASME A17.8 shall mean ASME A17.8-2016/CSA B44.8-16;
- d. ASME A18.1 shall mean ASME A18.1 (2014), except Chapters 4, 5, 6, and 7;
- e. ANSI A117.1 shall mean ANSI A117.1 (2017), except for requirement 407.4.7.1.2; and
- f. ANSI/NFPA 70 shall mean ANSI/NFPA 70 (2016).

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 8759B, IAB 5/19/10, effective 6/23/10; ARC 0168C, IAB 6/13/12, effective 7/18/12; ARC 1232C, IAB 12/11/13, effective 1/31/14; ARC 1766C, IAB 12/10/14, effective 1/14/15; ARC 1971C, IAB 4/29/15, effective 6/3/15; ARC 3742C, IAB 4/11/18, effective 5/16/18]

875—72.2(89A) Definitions. The definitions contained in ASME A17.1, ASME A18.1, ANSI A117.1, and any other standard adopted herein by reference shall be applicable as used in this chapter to the extent that the definitions do not conflict with the definitions contained in Iowa Code chapter 89A and these rules. However, the definition of “building code” in ASME A17.1 is modified to exclude the Building Construction and Safety Code (NFPA 5000) and the National Building Code of Canada (NBCC) for any installation after March 1, 2008.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—72.3(89A) Accommodating the physically disabled. All passenger elevators installed between January 1, 1975, and December 31, 1982, which are available and intended for public use shall be usable by the physically disabled. All passenger elevators shall have control buttons with identifying features for the benefit of the blind and shall allow for wheelchair traffic. All passenger elevators and wheelchair lifts installed on or after January 1, 1983, which are accessible to the general public shall comply with Accessible and Usable Buildings and Facilities ANSI A117.1, sections 407 and 408.

875—72.4(89A) Electric elevators. The provisions contained in ASME A17.1, part 2, are adopted by reference.

875—72.5(89A) Hydraulic elevators. The provisions contained in ASME A17.1, part 3, are adopted by reference.

875—72.6(89A) Power sidewalk elevators. The provisions contained in ASME A17.1, section 5.5, are adopted by reference.

875—72.7(89A) Performance-based safety code. Conveyances may comply with ASME A17.7, in whole or in part, as an alternative to ASME A17.1.

875—72.8(89A) Hand and power dumbwaiters. The provisions contained in ASME A17.1, sections 7.1, 7.2, 7.3, and 7.8, are adopted by reference.

875—72.9(89A) Escalators and moving walks. The provisions contained in ASME A17.1, part 6, are adopted by reference, except for those portions that allow an operating or safety device to reset automatically.

[ARC 1766C, IAB 12/10/14, effective 1/14/15]

875—72.10(89A) General requirements.

72.10(1) The provisions contained in ASME A17.1, Part 8, are adopted by reference unless specifically excluded herein.

72.10(2) Except as noted in this rule, the American Society of Mechanical Engineers Safety Code for Existing Elevators and Escalators, A17.3 (2011), is adopted by reference with an enforcement date of May 1, 2020.

a. If a code provision that is more restrictive than A17.3 (2011) applied to a conveyance when the conveyance was installed, the more restrictive provision shall remain in effect.

b. A17.3 (2011) Part X applies to handicapped restricted use elevators without regard to the scope provisions set forth in A17.3 (2011) Part X.

c. Provisions of A17.3 (2011) that require installation of a new controller to implement Phase 1 and Phase 2 fire service or car top operation are not adopted by reference and shall not be enforced in Iowa.

d. A17.3 (2011), Rule 2.3.2, is intended to prevent the accumulation of sewer gas in an elevator pit and shall not be interpreted to require the addition of a drain pipe in an existing pit. An air gap in an existing drain pipe shall be considered adequate compliance.

e. An elevator that was legally installed with guide rails made of materials other than steel shall not be required to replace the guide rails due to the adoption of A17.3 (2011).

[ARC 1891C, IAB 3/4/15, effective 4/8/15]

875—72.11(89A) Acceptance and periodic tests and inspections of elevators, dumbwaiters, escalators and moving walks. Rescinded IAB 6/17/09, effective 7/22/09.

875—72.12(89A) Wind tower lifts. Wind tower lifts authorized by this rule shall not be installed in grain elevators, high-rise buildings, water towers, television towers or any facility other than a wind tower built for the production of electricity. This rule applies to all wind tower lifts, whether installed before or after May 28, 2008; however, this exception shall not apply to a wind tower lift if the contract for its installation is executed after an AECO is accredited.

72.12(1) Wind tower lifts that meet the requirements of subrules 72.12(2) through 72.12(10) are exempt from the requirements of ASME A17.1. This temporary exemption shall terminate for a wind tower lift upon the occurrence of at least one of the following events:

a. Three weeks have passed since the accreditation of at least one AECO, and the manufacturer of the wind tower lift has not filed with the labor commissioner an affidavit attesting that a request for Certificate of Conformance as described by ASME A17.7 (2007) was submitted to an AECO.

b. The AECO has reviewed a request pursuant to ASME A17.7 and refused to issue a Certificate of Conformance for the model or series of lifts.

c. The AECO has determined that modifications to the wind tower lift are necessary, and the modifications have not been made with reasonable diligence.

d. The AECO has determined that modifications to the wind tower lift are necessary, and the labor commissioner determines the wind tower lift is not safe to operate prior to completion of the modifications.

e. The AECO has reviewed an application pursuant to ASME A17.7 and issued a Certificate of Conformance for the model or series of lifts.

72.12(2) A wind tower lift placed in operation on or before May 28, 2008, shall be registered by the owner with the labor commissioner no later than July 1, 2008, and shall pass an installation inspection by inspectors employed by the labor commissioner according to the schedule set by the labor commissioner. The wind tower lift shall receive a periodic inspection by the labor commissioner's inspectors annually thereafter.

72.12(3) The owner of a wind tower lift installed after May 28, 2008, shall register the wind tower lift with the labor commissioner prior to its installation. A wind tower lift installed after May 28, 2008, shall pass an installation inspection by the labor commissioner's inspectors prior to its being placed into operation. The wind tower lift shall receive a periodic inspection by the labor commissioner's inspectors annually thereafter.

72.12(4) Registration pursuant to this rule requires submission of the following information to the labor commissioner:

- a.* The unique identifier of the wind tower.
- b.* The name of the wind tower owner and contact information for the owner's representative.
- c.* The name of the wind tower lift manufacturer and contact information for the manufacturer's representative.
- d.* The location of the wind farm.
- e.* Three copies of the prints and design documents that are certified by a professional engineer duly licensed in the state of Iowa and that bear the professional engineer's P.E. stamp for the lifts.
- f.* The manufacturer's complete test procedures, inspection checklists, operating manual, service manual, and related documents as determined necessary by the labor commissioner.

72.12(5) The owner shall notify the labor commissioner within 30 days of any change in the information provided pursuant to 72.12(4) "b" and "c."

72.12(6) This subrule establishes reporting requirements in addition to the requirements of rule 875—71.3(89A). The manufacturer of a lift must notify the labor commissioner in writing within one week if one of its wind tower lifts anywhere in the world is involved in a personal injury accident requiring the service of a physician, a personal injury accident causing disability exceeding one day or death, or an incident causing property damage exceeding \$2,000. The notification shall specifically identify the model number, serial number, and owner of the lift, and a description of the incident or accident. The labor commissioner shall determine and require necessary inspections, tests, changes or enhancements to prevent a similar incident or accident in this state.

72.12(7) Wind tower lifts must comply with 29 CFR 1910.

72.12(8) The manufacturer shall notify the labor commissioner within seven days of notification to the manufacturer that an AECO has:

- a.* Issued a Certificate of Conformance for the model or series of wind tower lifts,
- b.* Refused to issue a Certificate of Conformance for the model or series of wind tower lifts, or
- c.* Determined that modifications to the wind tower lifts are necessary.

72.12(9) Wind tower lifts shall pass an inspection covering the following criteria:

- a.* Ascending speed, descending speed, and emergency descending speed shall not exceed the manufacturer's recommendations.
- b.* Stop switch, interior lighting, cage entry door, door contact, operating controls and remote operating controls shall operate according to manufacturer's recommendations.
- c.* Interior floor and cage framework shall appear to be structurally sound.
- d.* Enclosure signage recommended by the manufacturer shall be in place.
- e.* Manufacturer's data plate shall be visible.
- f.* Hoisting mechanism shall appear to be structurally sound and intact from inside and outside the car.
- g.* Guide shoes shall appear to be structurally sound and undamaged.
- h.* Suspended power cords and strain relief devices shall reveal no visible damage.
- i.* Upper and lower normal and final limits shall operate according to the manufacturer's recommendations.
- j.* Overspeed device shall successfully pass a full-load test.
- k.* Overload device shall successfully pass an overload test according to the manufacturer's recommendations.
- l.* Wire rope, safety rope, and guide rope shall show no evidence of wear.

m. Guide rope attachments, suspension attachment beam, beam tower attachments, suspension rope attachment, suspension rope secondary attachment (if present), and guide wire rope attachments shall show no evidence of wear or fatigue.

n. The wind tower lift shall not drift when subjected to a static full load.

o. Maintenance logs, tags, and other necessary documentation shall be available in sufficient detail to establish that maintenance is occurring pursuant to the manufacturer's schedule.

p. Guide rope tension device, safety rope tension device, and suspension rope tension device shall pass a visual test for proper tension.

q. Power cord catch basket shall pass a visual inspection.

r. Safety set distance, overspeed trip speed, overload limit setting, and maximum overload allowed shall not exceed manufacturer's recommendations.

s. A communication device, if installed in the car, shall be operable.

t. Any other items on the manufacturer's recommended inspection checklist shall pass inspection.

72.12(10) The owner or owner's representative shall provide weights as needed to perform necessary tests during inspections.

875—72.13(89A) Alterations, repairs, replacements and maintenance.

72.13(1) General. Except as set forth in this rule, all maintenance, repairs, replacements, and alterations shall comply with the edition of ASME A17.1 currently adopted for new conveyances at rule 875—72.1(89A) or ASME A17.7-2007/CSA B44-07, as applicable. Rule 875—71.10(89A) describes alterations which require that the entire conveyance be brought into compliance with the most current codes.

72.13(2) Exemption for button renumbering. All maintenance, repairs and alterations to devices covered by ANSI A117.1 shall comply with ANSI A117.1 (2017), except for requirement 407.4.7.1.2.

72.13(3) Sump pump exemption. The provisions of ASME A17.1 that require a pit sump or drain shall not apply to an elevator alteration when all of the following criteria are met:

a. No other code or rule requires that the pit be excavated or lowered.

b. The alteration plans do not include the excavation or lowering of the pit floor for any other reason.

c. There is evidence that groundwater has not entered the pit previously.

d. The location and geology of the building indicate a likelihood that groundwater would enter the pit if the foundation or pit floor were breached to install the pit sump or drain.

e. A description of alternative means to maintain the pit in a dry condition is provided to the labor commissioner with the alteration permit application.

f. The labor commissioner approves the alternative means to maintain the pit in a dry condition.

g. The alternative means to maintain the pit in a dry condition are installed or implemented as described in the alteration permit application.

72.13(4) Pit excavation exemption. The full length of the platform guard set forth in ASME A17.1, Rule 2.15.9.2(a), shall not be required if all of the following criteria are met:

a. No other code or rule requires that the pit be excavated or lowered.

b. The alteration plans do not include the excavation or lowering of the pit floor for any other reason.

c. A full-length platform guard would strike the pit floor when the elevator is on its fully compressed buffer.

d. The clearance between the bottom of the platform guard and the pit floor is 2.5 centimeters (1 inch) when the elevator is on its fully compressed buffer.

72.13(5) Sprinkler retrofits and shunt trip breakers. When a sprinkler is added to a hoistway or machine room, the conveyance shall comply with the following:

a. The installation shall comply with the applicable version of ASME A17.1, Rule 2.8.3.3.

b. The elevator controls shall be arranged to comply with the phase I fire recall provisions of the applicable version of ASME A17.1, Rule 2.27.3.

c. The applicable version of ASME A17.1 shall be determined by reference to rule 875—72.1(89A). For purposes of rule 875—72.13(89A), the relevant subrule of 875—72.1(89A) shall apply based on the date the sprinkler is installed instead of the date the conveyance was installed.

72.13(6) Alterations of handicapped restricted use elevators. A component of a handicapped restricted use elevator being altered shall comply with the portions of ASME A17.1, section 5.3, applicable to the component. The edition of ASME A17.1 adopted by reference in rule 875—72.1(89A) shall be applied.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 1766C, IAB 12/10/14, effective 1/14/15; ARC 2396C, IAB 2/17/16, effective 3/23/16; ARC 3742C, IAB 4/11/18, effective 5/16/18]

875—72.14(89A) Design data and formulas. Rescinded IAB 11/26/03, effective 1/1/04.

875—72.15(89A) Power-operated special purpose elevators. The provisions contained in ASME A17.1, section 5.7, are adopted by reference.

875—72.16(89A) Inclined and vertical wheelchair lifts. The provisions contained in ASME Safety Standard for Platform Lifts and Stairway Chairlifts A18.1, sections 1, 2, 3, 8, 9, and 10, are adopted by reference for all inclined and vertical wheelchair lifts.

875—72.17(89A) Hand-powered elevators. Hand-powered elevators shall not be installed after January 1, 1983.

875—72.18(89A) Accommodating the physically disabled. Renumbered as 875—72.3(89A), IAB 11/26/03, effective 1/1/04.

875—72.19(89A) Limited-use/limited-application elevators. The provisions contained in ASME A17.1, section 5.2, are adopted by reference.

875—72.20(89A) Rack and pinion, screw-column elevators. The provisions contained in ASME A17.1, sections 4.1 and 4.2, are adopted by reference.

875—72.21(89A) Inclined elevators. The provisions contained in ASME A17.1, section 5.1, are adopted by reference.

875—72.22(89A) Material lift elevators. The provisions contained in ASME A17.1, Sections 7.4 through 7.7 and 7.9 through 7.11, are adopted by reference for material lift elevators installed on or after August 10, 2016.

[ARC 2603C, IAB 7/6/16, effective 8/10/16]

875—72.23(89A) Elevators used for construction. The provisions contained in ASME A17.1, section 5.10, are adopted by reference only as they pertain to elevators utilizing permanent equipment in a permanent location.

875—72.24(89A) Construction personnel hoists. The provisions of American National Standards Institute (ANSI) A10.4-2007 are adopted by reference for construction personnel hoists as defined by ANSI A10.4-2007. Notwithstanding the ANSI definition, these conveyances may be used only temporarily during construction.

875—72.25(89A) Alarm bell. An automatic passenger elevator shall be provided with an alarm bell that is activated by a switch marked “ALARM” located in or adjacent to the car operating panel. The alarm bell shall be audible inside the car and outside the hoistway.

[ARC 0950C, IAB 8/21/13, effective 9/25/13]

875—72.26(89A) Child entrapment safeguards. This rule applies to a passenger elevator unless it has a car door consisting of a solid panel.

72.26(1) For purposes of this rule, “distance with deflection between the doors or gates” means the distance between the closed car door or gate and the closed hoistway door or gate measured at the greatest perpendicular distance with deflection.

72.26(2) For purposes of this rule, measurements of door or gate deflection shall be made in the manner described by ASME A17.1, section 2.14.4.6.

72.26(3) Door or gate deflection shall not exceed .75 inch.

72.26(4) If the distance with deflection between the doors or gates exceeds 5 inches, a means shall be provided to disable the elevator if a person is in the space between the closed doors or gates.
[ARC 1972C, IAB 4/29/15, effective 6/3/15; ARC 2455C, IAB 3/16/16, effective 4/20/16]

875—72.27(89A) Handicapped restricted use elevators. All handicapped restricted use elevators must meet ANSI A17.1 (1981), Part V. Additionally, the elevators shall comply with the following limitations:

1. The elevator shall be used only by a maximum of one disabled person and one attendant at a time. Where a disabled person cannot operate the elevator in a manner which will ensure access to all operating controls and safety features, an attendant shall accompany the disabled person.

2. The elevator shall be key-operated and shall not be capable of being called by buttons or switches but may be called by a key operator.

3. Keys to operate the elevator shall be in the control of the disabled person, the attendant or persons in positions of responsibility at the location.

4. A list shall be maintained at the location indicating the persons holding keys for the operation of the elevator.

5. Each landing and the elevator car shall be posted to indicate that the elevator is only for the use of disabled persons.

6. The travel distance of the elevator shall not exceed 50 feet.
[ARC 1971C, IAB 4/29/15, effective 6/3/15]

875—72.28(89) Elevators in broadcast towers. This rule applies to special purpose elevators located in broadcast towers.

72.28(1) Anchorages. Anchorages compliant with 29 CFR 1926.502(d)(15) shall be attached inside the car and on the car top.

72.28(2) Emergency stop switch. An emergency stop switch compliant with ASME A17.1, Sections 2.26.2.8 and 5.7.19, shall be installed on the car top.
[ARC 2607C, IAB 7/6/16, effective 8/10/16]

These rules are intended to implement Iowa Code chapter 89A.

[Filed emergency 12/15/75, Notice 10/6/75—published 12/29/75, effective 12/15/75]

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[Filed emergency 12/4/92 after Notice 9/30/92—published 12/23/92, effective 12/23/92]

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[Filed ARC 0168C (Notice ARC 0011C, IAB 2/22/12), IAB 6/13/12, effective 7/18/12]

[Filed ARC 0950C (Notice ARC 0753C, IAB 5/29/13), IAB 8/21/13, effective 9/25/13]

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[Filed ARC 1766C (Notice ARC 1560C, IAB 7/23/14), IAB 12/10/14, effective 1/14/15]
[Editorial change: IAC Supplement 2/18/15]¹
[Filed ARC 1891C (Notice ARC 1771C, IAB 12/10/14), IAB 3/4/15, effective 4/8/15]
[Filed ARC 1971C (Notice ARC 1849C, IAB 2/4/15), IAB 4/29/15, effective 6/3/15]
[Filed ARC 1972C (Notice ARC 1853C, IAB 2/4/15), IAB 4/29/15, effective 6/3/15]
[Filed ARC 2396C (Notice ARC 2264C, IAB 11/25/15), IAB 2/17/16, effective 3/23/16]
[Filed ARC 2455C (Notice ARC 2356C, IAB 1/6/16), IAB 3/16/16, effective 4/20/16]
[Filed ARC 2603C (Notice ARC 2355C, IAB 1/6/16), IAB 7/6/16, effective 8/10/16]
[Filed ARC 2607C (Notice ARC 2422C, IAB 3/2/16), IAB 7/6/16, effective 8/10/16]
[Filed ARC 3742C (Notice ARC 3503C, IAB 12/20/17), IAB 4/11/18, effective 5/16/18]

¹ Adopted language of rule 875—72.22(89A) [ARC 6854B, 6/18/08] editorially restored IAC Supplement 2/18/15.

CHAPTER 73
CONVEYANCES INSTALLED PRIOR TO JANUARY 1, 1975

[Prior to 9/24/86, Labor, Bureau of [530]]

[Prior to 10/21/98, see 347—Ch 73]

875—73.1(89A) Scope, definitions, and schedule.

73.1(1) This chapter establishes minimum safety standards for all conveyances installed prior to January 1, 1975, except material lift elevators. Conveyances installed on or after January 1, 1975, shall conform with the requirements set forth in 875—Chapter 72. Material lift elevators installed prior to January 1, 1975, are not subject to regulation pursuant to Iowa Code section 89A.2.

73.1(2) The definitions contained in American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, A17.1 (1971), shall be applicable as used in this chapter to the extent that they do not conflict with the definitions contained in Iowa Code chapter 89A or 875—Chapter 71.

73.1(3) Except as noted in this rule, the American Society of Mechanical Engineers Safety Code for Existing Elevators and Escalators, A17.3 (2011), is adopted by reference with an enforcement date of May 1, 2020.

a. If a code provision that is more restrictive than A17.3 (2011) applied to a conveyance when the conveyance was installed, the more restrictive provision shall remain in effect.

b. A17.3 (2011) Part X applies to elevators covered by rule 875—73.21(89A) without regard to the scope provisions set forth in A17.3 (2011) Part X.

c. Provisions of A17.3 (2011) that require installation of a new controller to implement Phase 1 and Phase 2 fire service or car top operation are not adopted by reference and shall not be enforced in Iowa.

d. A17.3 (2011), Rule 2.3.2, is intended to prevent the accumulation of sewer gas in an elevator pit and shall not be interpreted to require the addition of a drain pipe in an existing pit. An air gap in an existing drain pipe shall be considered adequate compliance.

e. The following shall substitute for the final sentence of A17.3 (2011) Rule 2.1.5(b): “Previously installed 60-inch chains are deemed to be in compliance.”

f. An elevator that was legally installed with guide rails made of materials other than steel shall not be required to replace the guide rails due to the adoption of A17.3 (2011).

73.1(4) The American Society of Mechanical Engineers Safety Code for Elevators and Escalators, A17.1-2013/CSA B44-13 (2013), Rule 2.14.7.1.4, is adopted by reference with an effective date of May 1, 2020.

73.1(5) Rules 875—73.2(89A) to 875—73.6(89A), 875—73.9(89A) to 875—73.17(89A), 875—73.19(89A), 875—73.22(89A), and 875—73.24(89A) and subrules 73.1(2), 73.7(1) to 73.7(9), 73.7(11), 73.18(1), and 73.18(3) to 73.18(7) shall be superseded by corresponding provisions of A17.3 (2011) on May 1, 2020.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 1891C, IAB 3/4/15, effective 4/8/15]

875—73.2(89A) Hoistways.

73.2(1) Each passenger elevator hoistway landing shall be protected with a door or gate. The door or gate shall be of solid construction and shall guard the entire entrance.

73.2(2) All automatic passenger elevators with power doors shall have nonvision panels on hoistway doors.

73.2(3) Each hoistway landing in any elevator hoistway shall be continuously provided with a properly working door or gate.

73.2(4) Where freight elevator hoistway doors or gates are of open or lattice construction, they shall be at least 6 feet high and shall come within 2 inches of the floor when closed. Gates shall be constructed to reject a ball 2 inches in diameter. Doors and gates must be able to withstand 250 pounds of pressure applied in the center of the door or gate without breaking or being forced out of their guides.

73.2(5) Manually operated biparting entrances of elevators which can be operated from the landings shall be provided with pull straps on the inside and outside of the upper panel where the lower edge of the upper panel is more than 6 feet 6 inches above the landing when the panel is in the fully opened position.

73.2(6) All freight elevators having wooden hoistway gates in an area where power loading equipment, such as fork trucks, electric mules, etc. are used shall have an acceptable means to restrain the power equipment from running through such wooden gates.

73.2(7) Each hoistway door or gate shall be provided with interlocks designed to prevent the car from moving unless the doors or gates are closed. Where doors or gates do not lock when closed they shall lock when the elevator is not more than 12 inches away from the floor. Passenger elevator hoistway doors shall be closed and locked before the car leaves the floor.

73.2(8) All hoistway-door interlocks shall function as part of a hoistway-unit system.

73.2(9) Automatic fire doors shall not lock any landing opening in the hoistway enclosure from the hoistway side nor lock any exit leading from any hoistway landing to the outside of the building.

73.2(10) Emergency keys for hoistway doors and service keys shall be kept readily accessible to authorized persons and elevator safety inspectors.

73.2(11) Access means shall be provided at one upper landing to permit access to the top of the car, and at the lowest landing if this landing is the normal point of access to the pit.

73.2(12) Each hoistway door or gate which is counterweighted shall have its weights enclosed in a box-type guide or run in metal guides. The bottom of the guides or boxes shall be so constructed as to retain the counterweight if the counterweight suspension means breaks.

73.2(13) Hoistways containing freight elevators shall be fully enclosed. Enclosures shall be unperforated to a height of 6 feet above each floor or landing and above the treads of adjacent stairways. Unperforated enclosures shall be so supported and braced as to deflect not over 1 inch when subjected to a force of 100 pounds applied horizontally to any point. Open work enclosure may be used above the 6-foot level and shall reject a ball 2 inches in diameter.

73.2(14) Hoistways containing passenger elevators shall be fully enclosed and the enclosure shall be of solid construction to its full height.

73.2(15) All elevators that have automatic leveling, inching or teasing devices and that are configured with landing sills that project into the hoistway shall be equipped with a bevel on the underside of the landing sill or the underside of projections found on the bottom section of vertically opening biparting doors. Bevels shall be constructed of smooth concrete or not less than 16-gauge metal securely fastened to the hoistway entrance. Bevels shall extend the full depth of the leveling zone plus 3 inches.

73.2(16) Every hoistway window opening seven stories or less on an outside wall above a thoroughfare and every such window three stories or less above a roof of the building or of an adjacent building shall be guarded to prevent entrance by fire or emergency rescue persons. Each such window shall be marked "hoistway" in a readily visible manner.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.3(89A) Car enclosure: Passenger.

73.3(1) Each passenger car shall be fully enclosed except on the sides used for entrance and exit. The enclosure shall be of solid construction. Grillwork at the top of the sides shall not be more than 8 inches high. If the car is provided with a solid door and there is no grillwork in the enclosure, adequate means of ventilation shall be provided.

73.3(2) Each passenger car enclosure shall have a top constructed of solid material. The top shall be capable of sustaining a load of 300 pounds on any area of 2 feet on a side and 100 pounds applied at any point. Simultaneous application of these loads is not required.

73.3(3) Passenger car enclosure tops shall have an emergency exit with cover. Opening size shall be as set forth in ANSI A17.1, 1971, Rule 204.1E. Hydraulic elevators provided with a manual lowering valve are not required to provide an emergency exit.

73.3(4) Each passenger car shall have a door or gate at each entrance. Doors or gates shall be of the horizontally sliding type. Doors shall be of solid construction. Gates shall be of the collapsible type. Gates and doors shall conform to ANSI A17.1, 1971, Rule 204.4.

73.3(5) Each passenger car door or gate shall have an electric contact to prevent the car from running with doors or gates open. EXCEPTIONS:

- a. By a car-leveling or truck-zoning device.
- b. By a combination hoistway access switch and operating device.
- c. When a hoistway access switch is operated.

73.3(6) All automatic passenger elevators with power doors shall have reopening devices on the doors, designed to reopen doors in the event the doors should become obstructed.

73.3(7) Car door or gate closing force.

a. Where a car door or gate of an automatic or continuous-pressure operation passenger elevator is closed by power, or is of the automatically released self-closing type, and faces a manually operated or self-closing hoistway door, the closing of the car door or gate shall not be initiated unless the hoistway door is in the closed position. The closing mechanism shall be so designed that the force necessary to prevent closing of a horizontally sliding car door or gate from rest shall be not more than 30 pounds.

b. Paragraph 73.3(7) "a" does not apply when both of the following conditions are met:

- (1) A car door or gate is closed by power through continuous pressure of a door-closing switch or the car operating device, and
- (2) The release of the closing switch or operating device will cause the car door or gate to stop or to stop and reopen.

73.3(8) Each passenger car shall have lighting inside the enclosure of not less than 5 foot-candles. Bulbs and tubes shall be guarded to prevent breakage.

73.3(9) Each passenger elevator shall have a capacity plate prominently displayed in its enclosure. The capacity plate shall list its capacity in pounds.

73.3(10) All passenger elevator car floors shall be maintained so that persons are not exposed to the hazards of tripping or falling.

73.3(11) All automatic passenger elevators shall be provided with an alarm bell capable of being activated from inside the car and audible outside the hoistway. If the elevator is not equipped with a bell, a two-way conversation device to the elevator and a ready accessible point outside the hoistway may be acceptable.

73.3(12) All automatic passenger elevators shall have their door open zones adjusted so that the door shall not open unless the car has stopped within 6 inches of floor level.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.4(89A) Car enclosure: Freight.

73.4(1) Each freight elevator car shall have a solid enclosure at least 66 inches in height. The space between the solid section and the car top shall be enclosed with solid material, perforated material, or latticework. Where used, perforated material or latticework shall reject a ball 1½ inches in diameter. The portion of open-type enclosure which passes the counterweights shall be of solid construction the entire width of the counterweights plus 6 inches on either side. The enclosure top shall be provided with an emergency exit, except for hydraulic elevators with manual lowering valves.

73.4(2) Each freight car enclosure shall have doors or gates at each entrance and shall be not less than 6 feet high. Each door or gate shall be constructed in accordance with ANSI A17.1, 1971, Rule 204.4.

73.4(3) Each car door or gate on a freight elevator shall have electric contacts to prevent the car from running with doors or gates open. EXCEPTIONS:

- a. By a car-leveling or truck-zoning device.
- b. By a combination hoistway access switch and operating device.
- c. When a hoistway access switch is operated.

73.4(4) Each freight elevator car enclosure shall be provided with a top. The top may be of solid or open-work construction and shall be of metal. The openwork shall reject a ball 2 inches in diameter.

Car tops shall be constructed to sustain a load of 200 pounds applied at any point on the car top. The top shall not have hinged or folding panels other than the emergency exit cover.

73.4(5) Each freight car enclosure shall have lighting not less than 2½ foot-candles. Bulbs or tubes shall be guarded to prevent breakage.

73.4(6) Each freight car enclosure shall have capacity plate, loading class plates, and a “No Passenger” sign conspicuously posted. Letters shall be not less than ½-inch high.

73.4(7) Freight elevators shall not be loaded to exceed the rated load as stated on their capacity plates.

73.4(8) Each freight elevator car floor shall be maintained so that personnel will not readily slip or trip. The floor shall be maintained so that it will hold its rated load without breaking through at any place in the car.

73.4(9) Freight elevators shall not be permitted to carry passengers other than the operator and persons to load and unload material.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.5(89A) Brakes.

73.5(1) Each electric elevator shall be provided with an electric brake.

73.5(2) Each brake shall be of the friction type applied by a spring or springs or gravity and released electrically. The brake shall be capable of holding the car at rest with its rated load.

875—73.6(89A) Machines.

73.6(1) Friction gearing or clutch mechanisms shall not be used for connecting the drum or sheaves to the main driving mechanism.

73.6(2) Set screw fastenings shall not be used on power elevators in lieu of keys or pins on connections subject to torque or tension.

73.6(3) Portable power-chain or cable hoist machines shall not be used to raise or lower an elevator car.

73.6(4) No belt or chain driven power machine shall be used for any elevator unless the machine is provided with a broken belt or broken chain safety switch of the electrical nonautomatic reset type. EXCEPTION: Hydraulic machines.

875—73.7(89A) Electrical protective devices.

73.7(1) All electric elevators shall have a labeled emergency stop switch. The switch shall be located on or adjacent to the operating panel.

73.7(2) All electric elevators shall have upper and lower final limit switches. Open-type switches shall not be accepted. Drum-type machines shall have final limit switches mounted on the machine and hoistway final limit switches.

73.7(3) All operating devices of car switch operations shall automatically return to the stop position and latch there when released.

73.7(4) Tiller-rope operations shall not be used unless all direction switches on controllers are mechanically operated. Contacts on direction switches shall be broken when the rope is at the centered position.

73.7(5) Except for firefighter service switches, leveling switches, and truck zone switches, no elevator shall be provided with a switch or device which makes more than one door or gate switch inoperative at any one time.

73.7(6) No person at any time shall make any required safety device or electrical protective device inoperative, except where necessary during tests, inspections or maintenance. Such devices shall be restored to their normal operating conditions as soon as all tests, inspections and maintenance have been completed. The conveyance shall not be left unattended while any of these devices are inoperative. To ensure that no jumpers are left behind, a counting system shall be utilized.

73.7(7) Each winding drum machine shall be provided with an electrical switch which shall disconnect power to the hoisting motor and brake when ropes are slackened.

73.7(8) No person shall enter an elevator pit for any reason without disconnecting power to the equipment using the pit stop switch, lockout, tagout procedures, or other appropriate means of de-energization in accordance with 875—Chapters 2 to 26.

73.7(9) Elevators having a polyphase AC power supply shall be provided with means to prevent the starting of the elevator drive motor or door motor if a reversal of phase rotation, or phase failure of the incoming polyphase AC power, will cause the elevator car or elevator door(s) to operate in the wrong direction.

73.7(10) All electrical equipment pertaining to the elevator shall conform to ANSI C1-1975 (NFPA 70-1975).

73.7(11) All electrical wiring in the machine room and hoistway shall be enclosed in metal conduit, flexible conduit or metal raceways.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 1971C, IAB 4/29/15, effective 6/3/15]

875—73.8(89A) Maintenance, repairs and alterations.

73.8(1) General. Except as set forth in this rule, all maintenance, repairs and alterations shall comply with the edition of ASME A17.1 currently adopted for new conveyances at rule 875—72.1(89A) or ASME A17.7-2007/CSA B44-07, as applicable. Rule 875—71.10(89A) describes alterations which require that the entire conveyance be brought into compliance with the most current code.

73.8(2) Exemption for button numbering. All maintenance, repairs and alterations to devices covered by ANSI A117.1 shall comply with ANSI A117.1 (2017), except for requirement 407.4.7.1.2.

73.8(3) Sump pump exemption. The provisions of ASME A17.1 that require a pit sump or drain shall not apply to an elevator alteration when all of the following criteria are met:

- a. No other code or rule requires that the pit be excavated or lowered.
- b. The alteration plans do not include the excavation or lowering of the pit floor for any other reason.
- c. There is evidence that groundwater has not entered the pit previously.
- d. The location and geology of the building indicate a likelihood that groundwater would enter the pit if the foundation or pit floor were breached to install the pit sump or drain.
- e. A description of alternative means to maintain the pit in a dry condition is provided to the labor commissioner with the alteration permit application.
- f. The labor commissioner approves the alternative means to maintain the pit in a dry condition.
- g. The alternative means to maintain the pit in a dry condition are installed or implemented as described in the alteration permit application.

73.8(4) Pit excavation exemption. The full length of the platform guard set forth in ASME A17.1, Rule 2.15.9.2(a), shall not be required if all of the following criteria are met:

- a. No other code or rule requires that the pit be excavated or lowered.
- b. The alteration plans do not include the excavation or lowering of the pit floor for any other reason.
- c. A full-length platform guard would strike the pit floor when the elevator is on its fully compressed buffer.
- d. The clearance between the bottom of the platform guard and the pit floor is 2.5 centimeters (1 inch) when the elevator is on its fully compressed buffer.

73.8(5) Sprinkler retrofits and shunt trip breakers. When a sprinkler is added to a hoistway or machine room, the conveyance shall comply with the following:

- a. The installation shall comply with the applicable version of ASME A17.1, Rule 2.8.3.3.
- b. The elevator controls shall be arranged to comply with the phase I fire recall provisions of the applicable version of ASME A17.1, Rule 2.27.3.
- c. The applicable version of ASME A17.1 shall be determined by reference to rule 875—72.1(89A). For purposes of rule 875—73.8(89A), the relevant subrule of 875—72.1(89A) shall apply based on the date the sprinkler is installed instead of the date the conveyance was installed.

73.8(6) Safety bulkheads. Documentation from the manufacturer establishing that a safety bulkhead was installed shall establish compliance with ASME A17.1, Rule 8.6.5.8.

73.8(7) Alterations of handicapped restricted use elevators. A component of a handicapped restricted use elevator being altered shall comply with the portions of ASME A17.1, section 5.3, applicable to the component. The edition of ASME A17.1 adopted by reference in rule 875—72.1(89A) shall be applied.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 1766C, IAB 12/10/14, effective 1/14/15; ARC 2396C, IAB 2/17/16, effective 3/23/16; ARC 3742C, IAB 4/11/18, effective 5/16/18]

875—73.9(89A) Machine rooms.

73.9(1) All means of access to elevator machine rooms shall be of a permanent nature and shall be constructed and maintained in a clear and unobstructed manner.

73.9(2) The elevator machine and control equipment shall be located in a separate room or separated from other equipment by a substantial grill not less than 6 feet high. The grill shall be of a design that will reject a ball 2 inches in diameter. All rooms or enclosures shall have a self-closing and self-locking door.

73.9(3) All elevator machine rooms shall be provided with a floor. The floor shall cover the entire area of the machine room and hoistway.

73.9(4) Machine room floors shall be kept clean and free of grease and oil. Articles or materials not necessary for the maintenance or operation of the elevator shall not be stored therein. Storage of any equipment or materials in elevator machine rooms other than equipment directly related to elevator operation is prohibited.

73.9(5) Lighting in the machine room shall be not less than 10 foot-candles at floor level.

73.9(6) Where there is more than one machine in a room, each machine shall have a different number conspicuously marked on it. The controller, disconnecting means and relay panels for each machine shall be conspicuously numbered to correspond to the machine they control.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.10(89A) Pits.

73.10(1) All pits shall be kept clean and free of equipment or material not relating to the operation of the elevator. EXCEPTION: sump pumps.

73.10(2) Buffers under cars and counterweights shall be permanently fastened to the floor or their supporting beams.

73.10(3) All elevators shall have counterweight guards. Guards shall be of unperforated metal of at least the strength of or braced to the equivalent strength of number 14-gauge sheet steel. Guards shall extend from a point not more than 12 inches above the pit floor to a point not less than 7 feet above the pit floor. Where guards are not feasible, warning chains shall be installed on the bottom of the counterweights and shall extend no less than 5 feet below the counterweight. Chains shall be of a number 10 U.S. gauge wire or of equal size. EXCEPTION: When compensating chains or ropes are used, a counterweight guard is not required.

73.10(4) Buffers shall be installed where elevator pits are not provided with buffers and where the pit depth will permit. Buffers shall comply with ANSI A17.1, 1971, Section 201.

73.10(5) Where the depth of any pit is in excess of 4 feet it shall have a ladder permanently installed. The ladder shall extend not less than 30 inches above the sill of the access door, or hand grips shall be provided to the same height. Ladder shall be of noncombustible material.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.11(89A) Counterweights.

73.11(1) Broken or cracked sections of counterweights shall be replaced.

73.11(2) Counterweight hanger rods, tie rods or both shall firmly support and secure the counterweight sections in place.

73.11(3) Wire ropes extending through counterweights from one stack to another shall be guarded by metal sleeves attached to the wire ropes. Stacks shall not be spaced less than 8 inches apart.

875—73.12(89A) Car platforms and car slings.

73.12(1) All platforms shall be soundly constructed without cracks or breaks in stringers or frames. All floors shall be free of holes.

73.12(2) All car slings shall be soundly constructed and free of cracks or breaks.

73.12(3) Where cable sheaves are used on the crosshead, they shall be firmly attached and free of cracks or breaks.

73.12(4) All elevators shall have data plates attached to the crosshead.

73.12(5) All elevators with automatic leveling, inching or teasing devices shall have a platform guard or an apron. All other elevators shall have warning chains hung within 2 inches of the edge of the platform on the entrance sides. Chains shall be of number 10 U.S. gauge wire or of equal size. Chains shall extend not less than 5 feet below the platform and shall not be spaced more than 4 inches apart.

73.12(6) All car slings shall have guide shoes at the top and bottom of the sling. Shoes that are worn to a degree which affect the safe operation of the car shall be repaired or replaced.

875—73.13(89A) Means of suspension.

73.13(1) Suspension ropes on drum-type machines shall have not less than one turn of the rope on the drum when the car is resting on the fully compressed buffers.

73.13(2) Winding drum machines shall not be used unless they are provided with not less than two hoisting ropes. Each counterweight stack shall be provided with not less than two ropes.

73.13(3) Tiller cables on cable-operated elevators shall be kept free of breaks.

73.13(4) On tiller-cable operations, the cable shall pass through a guiding or stopping device mounted on the car. The cable shall be provided with adjustable stop balls and be provided with means to lock and hold the car at a floor. Stop balls at top and bottom shall be adjusted to automatically stop the car. The tiller cable shall be completely enclosed in the hoistway.

73.13(5) All hoisting or counterweight ropes located outside of the hoistway that are exposed shall be covered with a box-type guard. The guard shall be not less than 6 feet high from floor level.

73.13(6) Roller chains shall not be used as the suspension means for any conveyance except where specifically allowed by an applicable provision of ASME A17.1.

73.13(7) Hoisting ropes for power elevators shall not be less than 3/8 inch in diameter.

73.13(8) Hoisting rope fastening means shall be of the socket and babbiting type. Clamps shall not be used.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.14(89A) Car safeties and speed governors.

73.14(1) Each elevator suspended by ropes shall be provided with mechanically applied car safeties which shall be capable of stopping and sustaining its rated load.

73.14(2) Broken rope or slack rope safeties may be allowed if the car speed is not in excess of 50 FPM.

73.14(3) Elevators which are provided solely with broken rope or slack rope safeties shall not be used for passenger service. EXCEPTION: Handicapped restricted use elevators.

73.14(4) All safeties shall be adjusted so that clearances from the rail shall be in accordance with ANSI A17.1, 1971, Rule 1001.2.

73.14(5) All slack cable safeties shall be provided with an electrical switch which disconnects power to the elevator machine and brake when setting of the safeties occurs.

73.14(6) All safeties operated by a speed governor shall be provided with a speed switch operated by the governor when used with type B or C car safeties on elevators having a rated speed exceeding 150 FPM. A switch shall be provided on the speed governor when used with a counterweight safety for any car speed.

73.14(7) Speed governors shall have their means of speed adjustment sealed.

73.14(8) For hoistways not extending to the lowest floor and where space below the hoistway is used for a passageway or is occupied by persons, or if unoccupied but not secured against unauthorized access, the counterweights of the elevator shall be provided with safeties. Safeties shall be tripped by a

speed governor if the car speed is in excess of 150 FPM. Speed governors shall be set to trip above the car governor tripping speed but not more than 10 percent greater.

73.14(9) Access to a governor that is located inside a hoistway shall be provided in accordance with ASME A17.1-2007, Rule 2.7.6.3.4.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 8760B, IAB 5/19/10, effective 6/23/10]

875—73.15(89A) Guide rails.

73.15(1) All guide rails and brackets whether of wood or steel shall be firmly and securely anchored or bolted in place. Where T rail is used, all fish-plate bolts shall be tight. This shall comply with ANSI A17.1, 1981, Section 200.

73.15(2) Where guide rails which are worn to such a point that proper clearance of safety jaws cannot be maintained, the worn sections shall be replaced to achieve clearances as specified in ANSI A17.1, 1971, Rule 1001.2.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.16(89A) Existing hydraulic elevators.

73.16(1) Cylinders of hydraulic-elevator machines shall be provided with a means for releasing air or other gas.

73.16(2) Each pump or group of pumps shall be equipped with a relief valve conforming to the following requirements:

a. Type and location. The relief valve shall be located between the pump and the check valve and shall be of such a type and so installed in the bypass connection that the valve cannot be shut off from the hydraulic system.

b. Setting. The relief valve shall be preset to open at a pressure not greater than that necessary to maintain 125 percent of working pressure.

c. Size. The size of the relief valve and bypass shall be sufficient to pass the maximum rated capacity of the pump without raising the pressure more than 20 percent above that at which the valve opens. Two or more relief valves may be used to obtain the required capacity.

d. Sealing. Relief valves having exposed pressure adjustments, if used, shall have their means of adjustment sealed after being set to the correct pressure.

EXCEPTION: No relief valve is required for centrifugal pumps driven by induction motors, provided the shut-off, or maximum pressure which the pump can develop, is not greater than 135 percent of the working pressure at the pump.

73.16(3) Storage and discharge tanks shall be covered and suitably vented to the atmosphere.

73.16(4) Hydraulic elevators shall be governed by the rules contained in Chapter 73 that apply to electric elevators except the following rules which are exempt: 73.5, 73.6(3), 73.7(2), 73.7(4), 73.7(7), 73.9(9), 73.10(3), 73.11, 73.13, and 73.14.

73.16(5) Rescinded IAB 3/7/01, effective 4/11/01.

875—73.17(89A) Existing sidewalk elevators.

73.17(1) Hoistways shall be permanently enclosed. The enclosures shall conform to ANSI A17.1, 1971, Rule 401.1.

73.17(2) All interior landings shall have a door or gate which shall be provided with an interlock.

73.17(3) Doors opening in sidewalks or other areas exterior to the building shall be of the hinged type. Doors or covers shall be designed to hold a static load of 300 pounds per square foot. Doors shall always be closed unless elevator is at the landing.

73.17(4) Stops shall be provided to prevent the cover in the opening of the sidewalk from opening more than 90 degrees from its closed position.

73.17(5) Covers in sidewalk shall be designed to close when the car descends from the top landing.

73.17(6) Recesses or guides which will securely hold the cover in place on the car stanchions shall be provided on the underside of the cover.

73.17(7) All electrical wiring shall be enclosed in metal conduit, flexible conduit or metal raceways. If hoistway opens in the sidewalk, the wiring shall be weatherproof.

73.17(8) Operating devices and control equipment shall comply with ANSI A17.1, 1971, Rule 402.4.

73.17(9) All electric sidewalk elevators shall have upper and lower final limit switches. Open-type switches shall not be allowed.

73.17(10) Cars shall have enclosures which shall be not less than 6 feet in height provided the stanchions and bow iron are of sufficient height. The enclosure shall be provided with electric contacts to prevent the car from running with doors or gates open.

73.17(11) Cars shall have safeties. Where the speed of the elevator does not exceed 50 FPM, car safeties which operate as a result of breaking or slackening of the hoisting ropes may be used. Such safeties may be of the inertia type or approved type without governors. Governors shall not be required when car speed does not exceed 50 FPM.

73.17(12) Car enclosures and car gates shall not be required for hand-powered sidewalk elevators.

73.17(13) Rescinded IAB 3/7/01, effective 4/11/01.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.18(89A) Existing hand elevators.

73.18(1) Hand-powered elevators shall have hoistway doors. Doors shall be of the self-closing and self-locking type.

73.18(2) A sign reading “Danger—Elevator Hoistway—Keep Closed” shall be mounted on each hoistway door. The letters on the signs shall be legible, shall be at least 2 inches high, and shall contrast with the background color.

73.18(3) All hand-powered elevators shall be provided with safeties or slack cable devices. Safeties do not have to be operated by a speed governor unless the speed is in excess of 50 FPM.

73.18(4) Hand-powered elevators shall have a car enclosure which shall be constructed of metal or sound seasoned wood. The enclosure shall cover all sides which are not used for entrance or exit. The enclosure shall be secured to the car platform or frame in such a manner that it cannot work loose or become displaced in ordinary service.

73.18(5) Each hand-powered elevator shall be provided with a brake which shall be capable of stopping and sustaining the car whether loaded or unloaded.

73.18(6) Hand-powered elevators shall not be converted or changed to electric powered unless the complete conveyance is brought into conformity with 875—Chapter 72.

73.18(7) Rescinded IAB 3/7/01, effective 4/11/01.

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.19(89A) Power-operated special purpose elevators.

73.19(1) Elevators complying with the following requirements may be installed in any structure where the elevator is not accessible to the general public, is used exclusively for designated operating and maintenance employees only, and where transportation of one or two persons is required to attend machinery or equipment frequently.

73.19(2) The inside platform area of the car shall not exceed 9 square feet. The rated speed shall not exceed 100 FPM. The rated load shall not exceed 650 pounds.

73.19(3) Hoistways shall be enclosed to their full width, to a height of not less than 7 feet with solid or perforated noncombustible material braced to deflect not more than 1 inch when subjected to a force of 100 pounds applied horizontally at any point. Open work enclosures shall be at least number 13 steel wire gauge or expanded metal at least number 13 U.S. gauge and shall reject a ball 2 inches in diameter. Where counterweights pass, landing and stairway side shall be of solid construction.

73.19(4) Wiring shall comply with the requirements of the National Electrical Code, ANSI C1-1975 (NFPA 70-1975).

73.19(5) Counterweights shall comply with rule 875—73.11(89A).

73.19(6) Hoistway doors shall comply with subrules 73.2(1), 73.2(7) and 73.2(11).

73.19(7) Cars shall be solidly constructed in accordance with subrules 73.12(1) and 73.12(2).

73.19(8) Car enclosure.

a. Except at the entrance, the car shall be enclosed on all sides and the top. The enclosure at the sides shall be solid or openwork. All openwork shall reject a ball 1 inch in diameter. The enclosure shall be constructed of sufficient strength that it will not deflect more than 1 inch at any one point.

b. There shall be an electric light to illuminate the car or hoistway with the switch placed on or near the operating panel.

c. There shall be no glass used in the elevator car except for the car light.

73.19(9) A car door shall be provided at each car entrance. Door or gate shall guard the complete entrance. The door or gate shall be at least 7 feet high, of metal construction with solid or open construction to reject a ball 1 inch in diameter. A contact switch shall be provided to prevent the operation of the elevator with doors or gates open. The door or gate shall be provided with interlocks.

73.19(10) Guide rails shall comply with rule 875—73.15(89A).

73.19(11) The means and methods of suspension shall comply with subrules 73.13(1), 73.13(5), 73.13(6), 73.13(7), and 73.13(8).

73.19(12) Electrical switches shall comply with subrules 73.7(2) and 73.7(9).

73.19(13) Brakes shall comply with rule 875—73.5(89A).

73.19(14) Emergency signal or communication shall comply with subrule 73.3(11).

[ARC 7840B, IAB 6/17/09, effective 7/22/09]

875—73.20(89A) Inclined and vertical wheelchair lifts. All vertical and inclined wheelchair lifts shall conform to ANSI A17.1 (1981), part XX, sections 2000 and 2001.

875—73.21(89A) Handicapped restricted use elevators. All handicapped restricted use elevators must meet ANSI A17.1 (1981), Part V. Additionally, the elevators shall comply with the following limitations:

1. The elevator shall be used only by a maximum of one disabled person and one attendant at a time. Where a disabled individual cannot operate the elevator in a manner which will ensure access to all operating controls and safety features, an attendant shall accompany the disabled individual.

2. The elevator shall be key-operated and shall not be capable of being called by buttons or switches but may be called by a key operator.

3. Keys to operate the elevator shall be in the control of the disabled person, the attendant or persons in positions of responsibility at the location.

4. A list shall be maintained at the location indicating the persons holding keys for the operation of the elevator.

5. Each landing and the elevator car shall be posted to indicate that the elevator is only for the use of disabled persons.

6. The travel distance of the elevator shall not exceed 50 feet.

[ARC 7840B, IAB 6/17/09, effective 7/22/09; ARC 1971C, IAB 4/29/15, effective 6/3/15]

875—73.22(89A) Escalators.

73.22(1) Each escalator shall be provided with an electrically released mechanically applied brake capable of stopping the up and down traveling escalator with any load up to and including the rated load. The brake shall be located either on the driving machine or on the main drive shaft.

73.22(2) Starting switches shall be of the key-operated type. Starting switches shall be located on or near the escalator.

73.22(3) Emergency stop buttons or other type manually operated switches having red buttons or handles shall be accessibly located at or near the bottom and top landings. The buttons or levers shall be protected to prevent accidental operation.

73.22(4) A broken step-chain device shall be provided on each escalator that will cause interruption of power to the driving machine if a step chain breaks or if excessive sag occurs in either step chain.

73.22(5) Each escalator shall have comb plates at top and bottom landings of the escalator. Comb-plate teeth shall be meshed with and set into slots in the tread surface of the steps so that the points of the teeth are always below the upper surface of the treads.

73.22(6) Each escalator balustrade or moulding on the balustrade shall have a smooth surface. Screwheads shall set flush with the surface or be of the oval head type without any burrs or rough places on their surface.

73.22(7) The clearance on either side of the steps between the step tread and the adjacent skirt panel shall be not more than 3/16 inch.

73.22(8) Step treads shall be illuminated throughout their run. The light intensity shall be not less than 2 foot-candles.

73.22(9) An enclosed fused disconnect switch or circuit breaker arranged to disconnect the power supply to the escalator shall be in each machine room or wherever the controller is located.

73.22(10) A stop switch shall be provided in each machinery space where means of access to the space is provided. The switch when opened shall cause electric power to be removed from the escalator driving-machine motor and brake. The switch shall be of the manually opened and closed type and shall be marked "STOP".

73.22(11) Hand or finger guards shall be provided at the point where the handrail enters the balustrade.

73.22(12) Where the clearance of the upper outside edge of the balustrade and a ceiling or scaffold is less than 12 inches or where the intersection of the outside balustrade and a ceiling or soffit is less than 24 inches from the centerline of the handrail, a solid guard shall be provided in the intersection of the angle of the outside balustrade and the ceiling or soffit. The vertical front edge of the guard shall project a minimum of 14 inches horizontally from the apex of the angle. The escalator side of the vertical face of the guard shall be flush with the face of the wellway. The exposed edge of the guard shall be rounded.

This rule is intended to implement Iowa Code chapter 89A.

875—73.23(89A) Moving walks. Rescinded IAB 6/17/09, effective 7/22/09.

875—73.24(89A) Dumbwaiters. All dumbwaiters whether electric or hand powered shall conform to ANSI A17.1, 1971, section 700. Exceptions: Required rules for hoistway construction as set forth in ANSI A17.1, 1971, shall not apply to existing installations.

875—73.25(89A) Sprinkler retrofits and shunt trip breakers. Rescinded IAB 6/17/09, effective 7/22/09.

875—73.26(89A) Safety bulkheads. Rescinded IAB 6/17/09, effective 7/22/09.

875—73.27(89A) Child entrapment safeguards. This rule applies to a passenger elevator unless it has a car door consisting of a solid panel.

73.27(1) For purposes of this rule, "distance with deflection between the doors or gates" means the distance between the closed car door or gate and the closed hoistway door or gate measured at the greatest perpendicular distance with deflection.

73.27(2) For purposes of this rule, measurements of door or gate deflection shall be made in the manner described by ASME A17.1, section 2.14.4.6.

73.27(3) Door or gate deflection shall not exceed .75 inch.

73.27(4) If the distance with deflection between the doors or gates exceeds 5 inches, a means shall be provided to disable the elevator if a person is in the space between the closed doors or gates.

[ARC 1972C, IAB 4/29/15, effective 6/3/15; ARC 2455C, IAB 3/16/16, effective 4/20/16]

875—73.28(89) Elevators in broadcast towers. This rule applies to special purpose elevators located in broadcast towers.

73.28(1) Anchorages. Anchorages compliant with 29 CFR 1926.502(d)(15) shall be attached inside the car and on the car top.

73.28(2) *Emergency stop switch.* An emergency stop switch compliant with ASME A17.1, Sections 2.26.2.8 and 5.7.19, shall be installed on the car top.

[ARC 2607C, IAB 7/6/16, effective 8/10/16]

These rules are intended to implement Iowa Code chapter 89A.

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