567—43.3(455B) PWS construction.

43.3(1) *PWS standards.*

a. Any PWS that does not meet the drinking water standards in 567—Chapters 41 and 43 shall make alterations necessary to comply with the drinking water standards in accordance with the construction standards contained in this rule unless the PWS has been granted a waiver from an MCL or TT as a provision of its operation permit pursuant to this chapter, provided that the PWS meets the schedule established pursuant to this chapter.

b. Any PWS that, in the opinion of the director, contains a potential hazard shall make alterations necessary to eliminate or minimize the hazard in accordance with the construction standards in this rule.

c. A PWS that is not operating within the construction 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 that does not address the current deficiencies.

43.3(2) *Construction standards.*

a. The construction standards for a drinking water project are the Ten States Standards, the AWWA Standards as adopted through 2023, and 43.3(7) through 43.3(9). In any conflict between the Ten States Standards, and the AWWA Standards, and 43.3(7) through 43.3(9), the Ten States Standards, 43.3(2), and 43.3(7) through 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 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) For CWS groundwater (GW) 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 GW systems, a single well is acceptable.

(3) Separation of water mains from sanitary and combined sewers.

1. Horizontal separation of water mains from gravity sanitary and combined sewers. Water mains shall be separated from gravity sanitary and combined sewer mains by a horizontal distance of at least ten feet measured edge to edge unless the bottom of the water main is at least 18 inches above the top of the sewer, and either:

- The water main is placed in a separate trench, or
- The water main is located on a bench of undisturbed earth at a minimum horizontal separation of three feet from the sewer.

If it is not possible to obtain a horizontal separation of three feet and a vertical separation of 18 inches between the bottom of the water main and the top of the sewer, a linear separation of at least three feet shall be provided, and one of the following shall be utilized:

- The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight end seals, or
- The sewer shall be constructed of water main materials.

The separation distance (SD) between the water main and the sewer shall be the maximum feasible in all cases.

2. Horizontal separation of water mains from sanitary sewer force mains. Water mains shall be separated from sanitary sewer force mains by a horizontal distance of at least ten feet measured edge to edge unless the sanitary sewer force main is constructed of water main materials and the water main is laid at least four feet horizontally from the sanitary sewer force main. The SD between the water main and the sanitary sewer force main shall be the maximum feasible in all cases.

3. Vertical separation of water mains from sanitary and combined sewer crossovers. Vertical separation of water mains crossing over any sanitary or combined sewers shall be at least 18 inches when measured from the bottom of the water main to the top of the sewer. If it is not possible to maintain the required vertical separation, one of the following shall be utilized:

- The bottom of the water main shall not be placed closer than six inches above the top of a sewer, or
- The top of the water main shall not be placed closer than 18 inches below the bottom of a sewer.

When a water main crosses below or less than 18 inches above a sanitary or combined sewer, one of the following shall be utilized within approximately ten feet measured edge to edge horizontally, centered on the crossing, with joints located as far as possible from the point of crossing:

- The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight ends, or
- Sewer pipe of water main material shall be installed.

The SD shall be the maximum feasible in all cases. Wherever a water main crosses a sanitary or combined sewer, the water main and sanitary or combined sewer pipes must be adequately supported. A low permeability soil shall be used for backfill material within ten feet of the point of crossing along the water main.

4. Horizontal separation of water mains from sanitary and combined sewer manholes. No water pipe shall pass through or come in contact with any part of a sanitary or combined sewer manhole. A minimum horizontal separation of three feet shall be maintained.

(4) Separation of water mains from storm sewers.

1. Horizontal separation of water mains from gravity storm sewers. Water mains shall be separated horizontally from gravity storm sewers by at least ten feet measured edge to edge. If it is not possible to maintain the required horizontal separation of ten feet, a minimum of three feet of separation shall be maintained and one of the following shall be utilized within ten feet measured edge to edge:

- The water main shall be constructed of ductile iron pipe with gaskets impermeable to hydrocarbons, or
- The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight end seals, or
- Storm sewer pipe of water main material shall be installed, or
- Reinforced concrete pipe storm sewers shall be constructed with gaskets manufactured in accordance with ASTM C443.

2. Vertical separation of water mains from storm sewer crossovers. Water mains shall be vertically separated from storm sewers by at least 18 inches between the outside edges of the water main and the storm sewer. The SD shall be the maximum feasible in all cases. In all cases where a water main crosses a storm sewer, the water main and storm sewer pipes must be adequately supported. A low permeability soil shall be used for backfill material within ten feet of the point of crossing along the water main. If it is not possible to obtain 18 inches of vertical separation where the water main crosses above a storm sewer, a minimum of 6 inches vertical separation shall be maintained and one of the following shall be utilized within ten feet measured edge to edge horizontally, centered on the crossing:

- The water main shall be constructed of ductile iron pipe with gaskets impermeable to hydrocarbons, or
- The water main shall be enclosed in watertight casing pipe with an evenly spaced annular gap and watertight end seals, or
- Storm sewer pipe of water main material shall be installed, or
- Reinforced concrete pipe storm sewers shall be constructed with gaskets manufactured in accordance with ASTM C443.

(5) All water mains, including those not designed to provide fire protection, shall be sized based on flow demands and pressure requirements. For regional water systems and for major distribution system upgrades, a hydraulic analysis may be required as part of the project submittal. Systems shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. The normal working pressure in the distribution system should be approximately 60 to 80 psi and should not be less than 35 psi.

b. When engineering justification satisfactory to the director is provided substantially demonstrating that a waiver from the construction standards will result in equivalent or improved effectiveness, a waiver may be granted by the director. A waiver denial may be appealed to the commission pursuant to 567—Chapter 7. Waiver 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 Iowa Code section 455B.183, except as provided in this chapter. Construction permits are not required for POU treatment devices installed by a noncommunity water system (NCWS), except for 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 PWS without a completed, department-approved viability assessment, which demonstrates that the system is viable pursuant to 567—43.8(455B).

a. Issuance conditions. A construction permit shall be issued by the director if the director concludes that the project will comply with department rules. Project construction must begin within one year from the permit issuance date; if it does not, the permit is no longer valid. If construction is ongoing and continuous (aside from weather delays) and the permitted project cannot be completed within one year, the permit shall remain valid until the project is completed. The department may extend a permit for a multiphase project, for a maximum two additional years.

b. Applications. A construction permit application for any project shall be submitted to the department at least 30 days prior to the proposed date for commencing construction or awarding contracts. This requirement may be waived when the department determines that an imminent health hazard exists to a PWS's consumers. 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 construction standards, 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. Fees. A nonrefundable fee, as noted in this paragraph, shall be submitted with a construction permit application.

(1) Construction permit fees. 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 $100; maximum $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 $100; maximum $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 fees. "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. The fee for water main projects permitted in accordance with 43.3(3)*"e"* shall be calculated in accordance with 43.3(3)*"c"*(1); however, the additional "as-built" fee of $200 shall not be assessed for these projects.

(3) Other fees. 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.

Other Categories	Rate
Change orders, addenda, and permit supplements for water mains	$0.10/ft. of additional water main, minimum: $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: $50
Request for time extension	$50

(4) Calendar year fee cap. The total amount of construction permit fees for a PWS 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 PWS 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 this chapter.

e. Minor water main construction permit. A PWS 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, extend, or replace new or 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 PWS by more than 5 percent over the duration of the permit.

The additional users must have been included in the system's approved hydraulic analysis. 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 approved standard specifications for water main construction filed 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 to the department 90 days before the anticipated first use of the permit. Construction shall not commence prior to the issuance of a permit.

(2) An application for minor water main construction permit shall include:

1. An up-to-date hydraulic analysis of the system, prepared by a licensed professional engineer (unless one is already on file with the department). The hydraulic basis of flow (gallons per minute per connection) used in the analysis must be acceptable to the department. A 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.

2. A completed Schedule 1b, Form 542-3151.

(3) The PWS must submit completed Schedule 2c, Form 542-3152, prior to the construction or replacement of each minor water main covered by a permit. Each water main covered by a 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, it must include all portions of the distribution system potentially affected by the new construction.

(4) By January 31 of the year following permit issuance, the PWS shall submit the following to the department:

1. A complete set of plans for all water main extensions constructed under the permit, prepared and submitted by a licensed professional engineer.
2. Completed Schedules 1a, 1c, and 2a.
3. The construction permit fee calculated in accordance with 43.3(3)*"c"*(1). The fee calculation shall be based upon the total length of water main constructed under a permit. For the purpose of calculating the total fee amount in accordance with 43.3(3)*"c"*(4), the fee shall be credited to the calendar year in which it was received by the department.

(5) A permit shall contain conditions deemed necessary by the director to ensure compliance with all applicable department rules.

(6) The director may modify a permit, in whole or in part, at any time. The director may suspend or revoke a 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 a permit includes but is not limited to:

1. Violation of any term or condition of a permit;
2. Misrepresentation of fact or failure to disclose fully all material facts in order to obtain a permit;
3. Failure to submit department-required records and information, both generally and as condition of a permit;
4. Failure to submit timely reports from previous permits; or
5. Failure to construct in accordance with either approved construction standards, in accordance with 43.3(2), or with the system's approved standard specifications.

(7) A minor water main construction permit expires on December 31 of the year in which it is issued.

(8) No waiver to the construction standards is allowed under a minor water main construction permit, except for AWWA C651 Section 5.1, Sampling Frequency. If a waiver to the construction 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 preparation of plans and specifications by a licensed professional engineer may be waived for the following types of projects, provided the proposed improvement complies with the construction standards. This waiver does not relieve the supplier of water from meeting the application and permit requirements of 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, 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 to determine if the simple chemical feed installation meets the applicable construction standards, pursuant to 43.3(2);

(4) The final installation is approved based on an on-site 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 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 psi;

(2) The plant is designed to serve no more than an average of 250 individuals per day;

(3) The supplier of water provides the department with a schematic of the installation, manufacturer's specifications, or other necessary information, sufficient to determine if the installation of the self-contained treatment unit will alleviate an MCL violation; and

(4) The final installation is approved based on an on-site inspection by department staff.

43.3(5) *Project planning and design basis.* An engineering report describing the project design basis must be submitted to the department either with the project or in advance of construction.

a. The report must contain information and data necessary to determine:

(1) Project conformance with the construction and operation standards in 43.3(2), and

(2) The adequacy of the project to supply water in sufficient quantity, at sufficient pressure, and of a quality that complies with drinking water standards in 567—Chapters 41 and 43.

b. The report must supply pertinent information as set forth in part one of the Ten States Standards.

c. The department may reject receipt or delay review of the plans and specifications until an adequate design basis 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.

a. An 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 PWSs specified in 43.3(2) are modified subsequent to an approval and the standard specifications would not be approvable under the modified standards.

b. Where approved specifications are on file, construction may commence 30 days following plan receipt 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 and monitoring requirements for new raw water source(s) and underground finished water storage facilities, and water supply separation distances (SDs).*

a. Site approval. The site for each proposed raw source or finished water below-ground level storage facility must be approved by the department prior to the submission of plans and specifications.

b. Site approval criteria. A site may be approved if the director concludes that the criteria in this paragraph are met.

(1) Groundwater (GW) source. GW wells shall be planned and constructed to adapt to the geologic and GW conditions of the proposed site to ensure production of water that is both microbially safe and free of substances that could cause harmful human health effects. GW wells must meet the following requirements:

1. Drainage must be directed away from a well in all directions for a minimum radius of 15 feet.

2. A well site must meet the minimum SDs from contamination sources specified in Table A in 43.3(7)*"d."*

3. After a well site has received preliminary department approval, the owner of the proposed well must submit, as part of the construction permit application, proof of legal control of the land for a 200-foot radius around the well, through purchase, lease, easement, ordinance, or other similar means. Legal control must be maintained by the PWS for the life of the well. The SDs specified in Table A in 43.3(7)*"d"* must be maintained for the life of the well as legal control allows. However, if the proposed well is for an existing NCWS and is replacing an existing well that either does not meet the current standards or is in poor condition, the 200-foot legal control requirement 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 PWS available to which the supply could connect.

4. No GW well shall be constructed within the projected plume of any known anthropogenic GW contamination without the department's written approval. The department may allow well construction within a contamination plume if an applicant can provide treatment that ensures all drinking water standards are met and ensures that the pumpage of the proposed well will not cause plume migration that

impacts the water quality of other nearby wells. An applicant must demonstrate, using a hydrogeologic model acceptable to the department, that the time of transport is greater than two years for any viral, bacterial, or other microorganism contaminant and greater than ten years for all chemical contaminants. The projected plume modeling must account for the proposed well pumpage rate. The department may require additional construction standards for these situations to ensure protection of the GW from contamination.

5. The department may require that an identification tag be applied to each GW 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 (SW) source.

1. An applicant must submit proof that a proposed SW source can, through readily available treatment methodology, comply with 567—Chapters 41 and 43, and that the SW 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 in 43.3(7)*"d."*

2. After a SW impoundment has received preliminary department approval for use as a raw water source, the owner of the PWS 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 specified in Table A in 43.3(7)*"d"* within the 400-foot distance. Proof of legal control should be submitted with the construction permit application and shall be submitted prior to issuance of a construction permit.

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 system classification. If multiple new sources are being added, sample compositing (within a single system) shall be allowed in accordance with the composite sampling requirements 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 system's operation permit monitoring schedule.

(2) GW sources. Water samples from GW sources shall be collected 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 and should 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) SW sources. Water samples from SW sources should be collected prior to the design of the SW treatment facility and shall be collected and analyzed prior to utilization of the source. 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. Samples shall be analyzed 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 (TOC), five-day biochemical oxygen demand, dissolved oxygen, surfactants, nitrogen series (organic, ammonia, nitrite, and nitrate), and phosphate.

d. Separation distances (SDs). The minimum lateral SDs between wells and belowground finished water storage facilities and structures or sources of contamination are specified below in Table A. Additional legal and conveyance-specific SD requirements are specified for public wells in 43.3(7)*"b"* and for water mains in 43.3(2)*"a"*(3) and *"a"*(4).

(1) There shall be no physical connection between a public or private potable water supply system and a sewer, or appurtenance thereto, that would permit the passage of any sewage into a potable water supply.

(2) When a proposed well is located in an existing well field and will withdraw water from the same aquifer as the existing well(s), the individual SDs listed in Table A may be waived if substantial historical data are available indicating that no contamination has resulted.

(3) Greater SDs than those listed in Table A may be required where necessary to ensure that no adverse effects to systems or the existing environment will result. Lesser SDs may be considered if detailed justification is provided by the applicant's engineer showing that no adverse effects will result from the lesser distance and the regional department field office staff recommend approval of the lesser distance. Such exceptions must be based on special construction techniques or localized geologic or hydrologic conditions.

TABLE A: PUBLIC WELL AND BELOWGROUND LEVEL FINISHED WATER STORAGE FACILITY SEPARATION DISTANCES

Structure or Source of Contamination	Required Minimum Lateral Distance, as Measured Horizontally on the Ground Surface, in feet		
	Public Wells		Belowground level finished water storage facility
	Deep Well[1]	Shallow Well[1]	
PRIVATE WELLS:			
Private wells (new or existing, deep or shallow)	200	400	50
GHEX loop boreholes[2]	200		50
WASTEWATER STRUCTURES:			
Land Disposal of Treated Wastes:			
Irrigation of wastewater	200	400	50
Land application of solid wastes[3]	200	400	50
Land application of septage[4]	500		50
Water treatment plant waste discharged to the ground surface	50		50
Other sanitary and industrial discharges to the ground surface	400		50
Wastewater Disposal Systems:			
Water treatment plant waste treatment structures[5]	50		50
PSDSs and onsite treatment systems – closed portion[6]	100	200	50
PSDSs and onsite treatment systems – open portion[6]	200	400	50
Lagoons[7]	400	1000	50
Mechanical wastewater treatment plants[8]	200	400	50
CHEMICALS:			
Transmission pipelines (including, but not limited to, fertilizer, liquid petroleum, or anhydrous ammonia)	200	400	50
Chemical applications to ground surface	100	200	50
Chemical and mineral storage, except for liquid propane gas (LPG)			
Above ground storage[9]	100	200	50
On or under ground storage	200	400	50
Liquid propane gas (LPG) storage tanks	15		15
ANIMALS:			
Animal pasturage	50		50
Animal enclosures (such as confinement buildings or open feedlots)	200	400	50
Earthen silage storage trenches or pits	100	200	50
Animal Wastes:			
Storage basins or lagoons or runoff control basins	400	1000	50
Solids stockpiles, solids settling facilities, or storage tanks	200	400	50
Land application of liquid, slurry, or solids	200	400	50
WATERBODIES:			

Structure or Source of Contamination	Required Minimum Lateral Distance, as Measured Horizontally on the Ground Surface, in feet		
	Public Wells		Belowground level finished water storage facility
	Deep Well[1]	Shallow Well[1]	
Flowing streams, ponds, lakes, reservoirs, wetlands, or drainage channels[10]	50		50
MISCELLANEOUS STRUCTURES:			
Basements, pits, or sumps[11]	10		10
Cemeteries	200		50
Cisterns	50	100	50
Railroads	100	200	50
Solid waste landfills and disposal sites[12]	1000		50
GRAVITY SANITARY SEWER MAINS AND STORM SEWERS[13] Includes sewers carrying water treatment plant wastes, building sewer service lines, and laterals[14]			
General gravity sanitary and storm sewer minimums	0-25: prohibited		0-25: prohibited
Water main materials[15]	25-75		25
Standard sanitary sewer materials[15]	75-200		50
SANITARY SEWER FORCE MAINS:[13]			
General sanitary sewer force main minimums	0-75: prohibited		0-50: prohibited
Water main materials[15]	75-400		50
Standard sanitary sewer materials[15]	400-1000		50
DRAINS:[13]			
General drains, including well house floor drains to sewers:			
General drain minimums	0-25: prohibited		0-25: prohibited
General drains - water main materials[15]	25-75		25-50
General drains - sanitary sewer materials[15]	75-200		50
Well house floor drains to surface:			
General well house floor drains to surface minimums	0-5: prohibited		0-5: prohibited
Standard sanitary sewer material[15]	5-50		5-50
MISCELLANEOUS CONVEYANCES:[13]			
Internal conveyance piping for water plant treatment process wastes treated onsite:			
Internal conveyance piping minimums	0-5: prohibited		0-5: prohibited
Standard sanitary sewer materials[15]	5-50		5-50

[1]Deep and shallow wells are defined in 567—40.2(455B).

[2]GHEX loop boreholes are defined in 567—49.2(455B).

[3]Solid wastes, for the purpose of land application, are those derived from the treatment of water or wastewater, including sewage sludge, as defined in 567—Chapter 67. Certain types of solid wastes from water treatment processes may be land-applied within the SD on an individual, case-by-case basis.

[4]Septage shall be land applied in accordance with 567—Chapter 68.

[5]The term "water treatment plant waste treatment structures" includes lagoons that are used solely to store wastes or wastewater from drinking water treatment plants, such as lime sludge storage lagoons.

[6]PSDS (private sewage disposal system) is defined in 567—subrule 69.1(2). "Onsite treatment system" includes any wastewater treatment system not included in the definition of a private sewage disposal system (i.e., provides treatment or disposal of domestic sewage from more than four dwelling units or 16 or more individuals on a continuing basis) that is utilizing onsite wastewater treatment technologies described in 567—Chapter 69 to treat domestic waste. Closed portion refers to the part of a treatment system that is fully contained and does not allow effluent or pretreated effluent to enter soil or groundwater (e.g., septic tank or impervious vault toilet). Open portion refers to the part of a treatment system that allows effluent or pretreated effluent to discharge into soil or groundwater for treatment or disposal (e.g., soil absorption system or unlined ISSF system). These SDs also apply to septic systems that are not considered privately owned.

[7]The term "lagoons" includes aerated lagoon systems, advanced aerated lagoon systems, and waste stabilization lagoons as defined in 567—subrule 81.1(1) and holding ponds, equalization basins, and sludge digestion or holding tanks as described in the

IWFDS. The term does not include lagoons used to dispose of water treatment plant wastes and anaerobic lagoons used for animal wastes. The SD from lagoons shall be measured from the water surface.

[8]The term "mechanical treatment plants" include activated sludge systems and fixed film biological treatment systems, as defined in 567—subrule 81.1(1), and any other wastewater disposal system that is not a PSDS, an onsite treatment system, or a lagoon.

[9]The minimum SD for liquid fuel storage associated with standby power generators shall be 50 feet if secondary containment is provided. Secondary containment shall provide for a minimum of 110 percent of the liquid fuel storage capacity. Double-walled storage tanks shall not be considered as secondary containment. Electrical power transformers mounted on a single utility pole are exempt from the SD requirements.

[10]Includes drainage channels that may have a direct connection to the groundwater table or a surface water.

[11]The SDs from basements, pits, and sumps must be met in order for a well to be considered a protected source for the purposes of the coliform sampling frequency determination in 567—subparagraph 41.2(1)*"e"*(4).

[12]Solid waste, when referring to landfills and disposal sites, 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.

[13]The SDs are dependent upon the two following factors: the type of piping that is in the existing sewer or drain, as noted in the table, and whether the piping was properly installed in accordance with the standards.

[14]The distances for building sewer service lines and laterals shall be considered the minimum distances when constructing sewer lines and shall be increased where possible to provide better protection.

[15]These are the type of materials or pipe used to construct the type of sewer, main, or drain as specified in accordance with 43.3(2) and Section 2.4 of the IWFDS.

43.3(8) *Drinking water system components.* Drinking water system components that come into contact with raw, partially treated, or finished water must be suitable for the intended use in a potable water system. Components must be certified by an American National Standards Institute (ANSI) accredited third party for conformance with ANSI/NSF Standard 61 and ANSI/NSF lead-free (through annex G of 372) specifications, if such specification exists for the particular product, unless approved components are not reasonably available for use. Component materials generally excluded from ANSI/NSF 61 requirements include concrete, stainless steel, and aluminum. If the component does not meet the ANSI/NSF Standard 61 and lead-free specifications or no specification is available, the person seeking to supply or use the component must prove to the department's satisfaction that the component is not toxic or otherwise a potential hazard in a potable PWS.

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 that allow filter media sizes greater than 0.55 mm.

43.3(10) *Best available treatment (BAT) technology.*

a. BATs for organic compounds. The table in 40 CFR §141.61(b) identifies either granular activated carbon (GAC), packed tower aeration (PTA), or oxidation (OXID) as the BAT, TT, or other means available for achieving compliance with the MCL for organic contaminants identified in 567—paragraph 41.5(1)*"b."* When setting MCLs for synthetic organic chemicals (SOCs), any BAT must be at least as effective as GAC.

b. BATs for inorganic chemicals (IOCs) and radionuclides.

(1) IOCs. The BAT for Inorganic Compounds table in 40 CFR §141.62(c) identifies the BAT technology, TT, or other means available for achieving compliance with the MCLs for the IOC contaminants listed in 567—paragraph 41.3(1)*"b,"* except fluoride.

(2) Arsenic. The Small System Compliance Technologies for Arsenic table in 40 CFR §141.62(c) identifies the affordable technology, TT, or other means available to systems serving 10,000 or fewer persons for achieving compliance with the arsenic MCL.

(3) Radionuclides.

1. Table B in 40 CFR §141.66(g) identifies the BAT for achieving compliance with the radionuclide MCL.

2. Table D in 40 CFR §141.66(h) identifies the radionuclides BATs for systems serving 10,000 or fewer people.

c. BATs for disinfection byproducts (DBPs) and disinfectants. The BATs for achieving compliance with the MCLs for the DBPs listed in 567—paragraph 41.5(2)*"b"* and the MRDLs listed in 567—paragraph 41.5(2)*"c"* are identified in 40 CFR §141.64.

d. Requirement to install the BAT. The department shall require CWSs and NTNCs 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 43.3(10)*"e."* If, after installation of the treatment method, a system cannot meet the MCL, it shall be eligible for a compliance schedule with an interim contaminant level granted under 567—subrule 40.5(9) and 567—43.2(455B).

e. Engineering assessment option. If a system can demonstrate through comprehensive engineering assessments, which may include pilot plant studies at the department's discretion, that the treatment methods identified in 43.3(10) would only achieve a de minimis reduction in contaminants, the department may establish a compliance schedule that requires the system being granted the waiver 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 a system to install or use a treatment method in connection with a compliance schedule established under 567—40.5(9) and 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). To avoid an URTH, the department may require a PWS to use bottled water, POU devices, POE devices, or other means as a condition of granting a waiver or an exemption from the requirements of 43.3(10) or as a condition of a compliance schedule.

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