

CHAPTER 55
AQUIFER STORAGE AND RECOVERY:
CRITERIA AND CONDITIONS FOR AUTHORIZING STORAGE,
RECOVERY, AND USE OF WATER

567—55.1(455B) Statutory authority. The authority for the department of natural resources to permit persons to inject, store, and recover treated water for potable use is given by Iowa Code sections 455B.261, 455B.265 and 455B.269. This permit requirement applies to any aquifer storage and recovery (ASR) system, including projects involving border streams. The person or water system seeking an aquifer storage and recovery permit must review the criteria for ASR permits and contact the department if a permit is required.

567—55.2 Reserved.

567—55.3(455B) Purpose. The aquifer storage and recovery rules are intended to describe aquifer storage and recovery, including defining the affected area within the aquifer, creating a permit program with technical criteria for evaluating ASR projects, and incorporating technical additions for the practice of treated water recovery. Legal rights and obligations affecting ASR permit holders are defined.

567—55.4(455B) Definitions. The following definitions shall apply to this chapter:

“Aquifer storage and recovery (ASR)” means the injection and storage of treated water in an aquifer through a permitted well during times when treated water is available and withdrawal of the treated water from the same aquifer through the same well during times when treated water is needed.

“Contiguous” means directly adjacent or touching along all or part of one side of a legally defined piece of property. Tracts of land involved in the same water supply and separated only by separators such as roads, railroads, or bike trails are deemed contiguous tracts.

“Displacement zone” means the three-dimensional area of dispersion into which treated water is injected for storage, subject to later recovery.

“Drawdown” means the decrease in water level at a pumping well due to the action of the pump.

“Limited registration” means a one-year written authorization for a nonrecurring use of water for the purpose of forecasting and testing the ASR well system, to include cyclic test pumping as necessary.

“Mechanical integrity” means any structural or material defect in the ASR well or well casing or appurtenances which will prevent or materially impair the injection or pumping of water (to and from) within an aquifer or contribute to aquifer contamination or impairment.

“Permit” means a written authorization issued to a permittee by the department for the storage of treated water in an existing aquifer or the subsequent withdrawal of treated water from an existing aquifer. The permit specifies the quantity, duration, location, and instantaneous rate of this storage or withdrawal.

“Permittee” means a water supply system which obtains a permit from the department authorizing the injection of and possession by storage of treated water in an aquifer, withdrawal of this water at a later date, and the actual beneficial use of the water.

“Receiving aquifer” means the aquifer into which treated water is injected under terms of an ASR permit.

“Recovered water” means water which is recovered from storage within the displacement zone under terms of an ASR permit.

“Stored water” means injected treated potable water which is stored in a receiving aquifer within the displacement zone under terms of an ASR permit.

“Treated water” for the purposes of this chapter means water which has been physically, chemically, or biologically treated to meet national primary and secondary drinking water standards and is fit for human consumption as defined in 567—Chapters 40 to 43, Iowa Administrative Code.

“Zone of influence” means a circular area surrounding a pumping water well where the water table has been measurably lowered due to the action of the pump.

567—55.5(455B) Application processing.**55.5(1) Application.**

a. Initial application for approval of an aquifer storage and recovery (ASR) project. A permit shall be required for the storage of all treated water in an aquifer for later recovery for potable uses. New permit applications (a request for a new permit, as distinguished from modification or renewal of an existing permit) shall be made on a form obtained from the department. An application form must be submitted by or on behalf of the water supply system owner, lessee, easement holder, or option holder of the area where the water is to be stored and recovered from an aquifer. An application must be accompanied by a map portraying:

- (1) The points of injection and withdrawal,
- (2) The immediate vicinity (topography) of the receiving aquifer,
- (3) Any production, test or other observation wells within the aquifer, and
- (4) The area of water storage.

The application must also include a description of the land where wells are located and water will be injected, withdrawn and used, oriented as to quarter section, section, township, and range. One application will be adequate for all uses on contiguous tracts of land. A water supply construction permit issued pursuant to 567—Chapter 43 will also be required for all injection/recovery wells.

b. Limited registration. The department's response to an initial application will be to issue a limited registration to initiate an ASR pretesting program pursuant to paragraph 55.6(1) "a"; only after approval of and completion of an ASR pretesting program with appropriate public notification pursuant to subrule 55.5(3) and proper evaluation of the test results will the department issue an ASR permit.

c. A request for modification or renewal of a permit shall be made in a similar manner. This application does not need to reiterate map and location information as previously submitted to the department (unless the information has changed). The limited registration requirement for aquifer pretesting does not apply to modified or renewed ASR permit requests (unless required by the department).

55.5(2) Application fee. A nonrefundable fee in the form of a credit card, check, or money order in the amount of \$200 payable to the Department of Natural Resources must accompany an application for a permit (and limited registration for aquifer pretesting) for aquifer storage and recovery. A \$200 fee must accompany an application for modification or renewal of an ASR permit.

55.5(3) Published notice—applicant limited registration. The department will issue a limited registration allowing the applicant to conduct test pumping of an ASR site pursuant to paragraph 55.6(1) "a." The applicant shall first publish notice of intent to test the injection and water pumpage/recovery equipment prior to receiving the limited registration. Publication shall be in a form and manner acceptable to the department, in the newspaper of largest circulation in the county where the ASR project is located, and proof of publication shall be submitted to the department. The department will then issue the limited registration, and the applicant shall notify contiguous landowners by U.S. mail of the receipt of the limited registration and the intent to test an ASR site.

55.5(4) Published notice—departmental intent to issue a final ASR permit. Before issuance of a final ASR permit, the department shall publish notice of proposed decision to issue an ASR permit or deny the ASR application. Publication shall be in the newspaper of largest circulation in the county where the ASR project is located. This publication shall summarize the department's findings on whether the application conforms to relevant criteria as outlined in subrule 55.6(1). An engineering or hydrogeological summary report prepared by department staff may be attached to the published summary of findings. Copies of the proposed decision shall be mailed to the applicant, any person who commented, and any other person who requests a copy of the decision. The decision shall be accompanied by a certification of the date of mailing. A proposed decision becomes the final decision of the department unless a timely notice of appeal is filed in accordance with 55.5(6).

55.5(5) Form of department decision. The decision on an application shall be a permit or denial letter issued by the department. Each permit shall include appropriate standard and special conditions consistent with Iowa Code sections 455B.261 to 455B.274 and 455B.281 and 567—Chapters 52 to 55.

The decision may incorporate by reference and attachment the summary report described in 55.5(4). Each decision shall include the following:

- a. Determinations as to whether the project satisfies all relevant criteria not addressed in an attached summary report.
- b. An explanation of the purpose for imposing each special condition.
- c. An explanation of consideration given to all comments submitted pursuant to 55.5(3) and 55.5(4) unless the comments are adequately addressed in the attached summary report.

55.5(6) *Appeal of department decision.* Any person aggrieved by an initial ASR permit decision may appeal the action. The person must submit a request for appeal in writing to the director within 30 days of the date of issuance of the final decision made by the department. A decision by the director on an appeal may be further appealed to the environmental protection commission (EPC). The form of appeal and appeal procedures are governed by 567—Chapter 7. The department shall mail a copy of the notice of appeal to each person who commented on the application.

55.5(7) *ASR permit public hearing.* Reserved.

567—55.6(455B) Aquifer storage and recovery technical evaluation criteria.

55.6(1) *Requirements.* Injections into aquifers for the purpose of treated water storage and subsequent withdrawals from the receiving aquifers intended for potable uses shall be subject to the following requirements:

a. *Aquifer pretesting.* Procurement of a limited registration for aquifer pretesting as outlined in subrule 55.5(1). The limited registration shall be for the period of one year and may be renewed for two additional one-year periods, for a total cumulative registration time not to exceed three years at the discretion of the department should the project require more than one year to be completed. The limited registration shall allow initial aquifer testing for determining the feasibility of aquifer storage and recovery, including placement of pumping and storage/extraction equipment. The testing approach shall be designed to provide information as needed to evaluate the ultimate capacity anticipated for the ASR project and provide assurance that the ASR site shall not restrict other uses of the aquifer. The testing program shall include injection rates and schedules, water storage volumes, recovery rates and schedule, and a final testing report.

b. *Engineering report.* An engineering evaluation of the technical feasibility of the proposed water injection and the probable percentage of recovery of treated water when pumped for recovery shall be submitted to the department. The engineering report shall include preliminary information from conceptual evaluations and aquifer pretesting such as:

- (1) Injection rates and schedules,
- (2) Water storage volumes,
- (3) The length of time the injected water will be stored,
- (4) The projected recovery rate,
- (5) Water quality data necessary to demonstrate the percentage of recovered water and that the water meets national drinking water standards,
- (6) Water level monitoring data including the location of observation wells, if any,
- (7) A plan detailing what to do with the recovered water if the intended use is not possible, and
- (8) A final testing protocol.

If the report can demonstrate by field test results or by a conceptual or mathematical hydrogeologic modeling that the injection, storage, and subsequent recovery will not adversely affect nearby users, the ASR project may be permitted after review by the department. A displacement zone containing the stored volume of water will not be allowed if it adversely affects another user's zone of influence. If the department finds through hydrogeologic modeling or during pretesting that the proposed displacement zone may impact the zone of influence of another user's existing well, additional testing will be required. The department may require the applicant to construct observation wells between the ASR site and nearby wells and may designate project-specific monitoring and reporting requirements at the observation wells.

c. Hydrogeologic evaluation. Hydrogeologic investigation of the site to evaluate potential quantitative and qualitative impacts to the aquifer, including changes to localized aquifer geochemistry, shall be part of the engineering report. Preliminary hydrogeologic information shall include:

- (1) The local geology,
- (2) A hydrogeologic flow model of the areal flow patterns,
- (3) A description of the aquifer targeted for storage,
- (4) Estimated flow direction and rate of movement,
- (5) Both permitted and private wells within the area affected by ASR wells, including best estimates of respective zones of influence,
- (6) Basis for estimating the displacement zone,
- (7) Anticipated changes to the receiving aquifer geochemistry due to the proposed ASR testing and use, and
- (8) Potable water quantity recovery estimates.

d. Protection of nearby existing water uses. The aquifer storage and recovery permit applicant shall demonstrate that the ASR site shall not restrict other uses of the aquifer by nearby water use permittees. An ASR applicant shall conduct and submit an inventory of nearby wells. The department, after considering the rate and amount of the ASR injections and withdrawals and the characteristics of the aquifer, will determine the extent of the inventory and the appropriate radius from the proposed ASR site. The department shall provide a map specifying the area in which the inventory is needed and forms specifying information to be gathered. The ASR permit applicant shall make a good-faith effort in obtaining available information from public records to identify nearby landowners and occupants and from drilling contractors identified by a landowner or occupant who responds to the inventory. The ASR applicant shall immediately notify the department of all objections raised by nearby landowners or other on-site problems such as the structural integrity of the injection equipment. Well interference conflicts arising from the proposed ASR site/project shall be resolved as outlined in 567—Chapter 54 or as otherwise specified by the department. Water recovery from an ASR site will not be permitted to any user other than the ASR permittee.

e. MCL exceedance limitation. No permit shall allow injected water to contain contaminants in excess of the maximum contaminant levels (MCLs) established by the department in 567—Chapters 40 to 43. Chemicals associated with disinfection of the water may be injected into the aquifer up to the standards established under 567—Chapters 40 to 43 or as otherwise specified by the department.

f. Reporting and record keeping. The permittee shall maintain a monthly record of injection and recovery, including the total number of hours of injection and recovery and the total metered quantity injected and recovered. The records must be submitted to the department annually. Project records including water quality testing records must be kept by the applicant for a period of five years. Water quality monitoring shall be at the frequency required by 567—Chapters 40 to 43 and as identified in the water system's public water supply operation permit. The applicant shall keep project records for a period of three years after termination of an ASR project and closure of the recovery wells.

g. Follow-up analysis by permittee. Reserved.

h. Vacating a permit for failure to construct and nonuse. The department may vacate the permit if the applicant fails to construct injection and water pumpage/recovery and ancillary equipment within three years of issuance of the permit (or subsequent permit modifications or renewals). The permit may also be vacated if the applicant does not use the storage system within three years of acquisition of the permit. A site abandonment plan including the physical removal of injection and water recovery equipment and the abandonment of all injection/recovery and observation wells pursuant to 567—Chapter 39 will be required of the applicant if the permit is vacated. A permittee whose permit is vacated may request a formal review of the action. The permittee must submit a request for review in writing to the director within 30 days of the date of notification of the final decision made by the department. A decision by the director in a formal review case may be further appealed to the environmental protection commission (EPC).

i. Mechanical integrity. Other conditions that are necessary to ensure adequate protection of water supplies may be imposed for mechanical integrity checks of the injection and treated water recovery well.

j. Revocation. The department may revoke or modify a permit to prevent or mitigate injury to other water users or otherwise protect aquifer water quality. The department may, based upon valid scientific data, further restrict certain chemicals in the injection source water if the department finds the constituents will interfere with or pose a threat to the maintenance of the water resources of the state for present or future beneficial uses.

k. Nonpotable uses. Reserved.

55.6(2) *Duration of permit, conditions of permit, and applicant property rights.* Permits for aquifer storage and recovery shall be issued for 20 years.

a. Conditions of permit. The permit will specify the maximum allowable injection rate at each well, the maximum allowable annual quantitative storage volume, and the maximum allowable instantaneous water withdrawal rate at each well.

b. Property of permittee. The department shall not authorize withdrawals of treated water from an aquifer storage and recovery site by anyone other than the permittee during the period of the permit and each subsequent renewal permit. Treated water injected into a receiving aquifer (and thereby comprising the “displacement zone”) as part of an ASR permit is the property of the permittee. Treated water which is recovered from storage within a displacement zone under terms of a permit shall be referred to as “recovered water” and shall be the property of the permittee. If a permit is revoked or otherwise surrendered, the ownership of the injected water within the aquifer (the water considered as “property”) reverts to the state of Iowa.

c. Restrictions on other wells within displacement zone. Existing wells within the displacement zone shall be plugged pursuant to 567—Chapter 39. No new private water wells, injection/withdrawal wells, observation wells, or public water supply wells shall be permitted by any governmental entity within the ASR displacement zone while the ASR permit is in effect. An ASR permit shall be filed with the appropriate county recorder to give constructive notice to present and future landowners of all conditions or requirements imposed by the final decision on an ASR application, including the well prohibition condition.

These rules are intended to implement Iowa Code sections 455B.261, 455B.265 and 455B.269.

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