

The Texas Commission on Environmental Quality (TCEQ, agency, or commission) adopts the amendments to §§331.2, 331.7, 331.11, and 331.181 - 331.186.

The amendments to §331.7 and §§331.182 - 331.186 are adopted *with changes* to the proposed texts as published in the December 25, 2015, issue of the *Texas Register* (40 TexReg 9552). The amendments to §§331.2, 331.11, and 331.181 are adopted *without changes* to the proposed text and, therefore, will not be republished.

Background and Summary of the Factual Basis for the Adopted Rules

This rulemaking implements House Bill (HB) 655, 84th Texas Legislature, 2015, addressing the commission's regulation of aquifer storage and recovery (ASR) projects in Texas. ASR involves the use of one or more injection wells for the purpose of placing a water supply into a subsurface geologic formation, or aquifer, for storage so that the water may be subsequently recovered and used by the project operator. ASR allows the operator to utilize an existing aquifer as a storage reservoir rather than using aboveground storage options. The stored water can be available for public or private drinking water supplies, agriculture, or industrial uses. The operator must assure that the aquifer formation receiving the injected water has appropriate geologic and hydrologic properties that are amenable to injection and will allow the control or containment of the injected water. The operator must assure that injection will not endanger any drinking water source that supplies or can reasonably be expected to supply any public water system. Such a drinking water source is endangered if injection may result in the presence of any contaminant that

may result in the system not being compliant with any national primary drinking water regulation, or if injection may otherwise adversely affect the health of persons. TCEQ's Underground Injection Control (UIC) program regulates the authorization, construction, operation, and closure of the injection wells used for ASR projects. Because ASR injection wells inject fluids into a formation that is considered an underground source of drinking water, ASR injection wells are classified as Class V injection wells. Other TCEQ regulatory programs, such as the Water Rights program or the Public Drinking Water program, may also be involved with ASR projects, depending on the original source of the injected water or the final use of the recovered water. Projects situated within a groundwater conservation district may be subject to the requirements of that district as provided in HB 655.

HB 655 amended Texas Water Code (TWC) to revise the requirements that apply to authorization for ASR projects. TWC, §11.153 was amended to allow the injection of appropriated water for an ASR project without obtaining any additional authorizations under TWC, Chapter 11, and to specify that commission approval of an ASR project is not contingent on the continuous availability of historic, normal stream flow. TWC, §11.155 was amended to remove the requirement for a pilot project prior to approval of an ASR project. TWC, Chapter 27 was amended to add TWC, Chapter 27, Subchapter G, Aquifer Storage and Recovery Projects, §§27.151 - 27.157. Under new TWC, §27.151, definitions were provided for the following terms: "Aquifer storage and recovery project," "ASR injection well," "ASR recovery well," "Native groundwater," and "Project operator." Under new TWC, §27.152, the commission is granted exclusive jurisdiction over the regulation and

permitting of ASR injection wells. Under new TWC, §27.153, the commission may authorize the use of a Class V ASR injection well by rule, individual permit, or under a general permit. Under new TWC, §27.153(b), in adopting rules or when issuing a permit for an ASR injection well, the commission shall consider if the injection of water will comply with the standards of the federal Safe Drinking Water Act, the amount of injected water that can be recovered, the effect of the ASR project on existing water wells, and the effect of the injected water on the physical, chemical, or biological quality of the native groundwater that would render the water produced harmful or detrimental to people, vegetation, or property. All wells associated with a single ASR project must be located within a continuous perimeter boundary. The commission is required to provide for public notice and comment on a proposed general permit, and the applicant for an individual permit is required to provide first class mailed notice to any groundwater conservation district in which the ASR wells will be located, and is required to publish notice in a newspaper of general circulation in the county in which the well will be located. Under new TWC, §27.154, the commission is directed to adopt technical standards governing the approval of the use of a Class V injection well as an ASR injection well. For an ASR project located within the jurisdiction of a groundwater conservation district or other special purpose district with authority to regulate groundwater withdrawal, the volume of groundwater recovered at an ASR project is limited to the volume of water injected. If the commission determines that a loss of injected water or loss of native water will occur, the commission shall impose additional restrictions on the amount of water that may be recovered to account for the loss. The commission may not deny a permit based on a determination that

such a loss will occur. The commission shall prescribe by rule construction and completion standards, metering, and reporting requirements for ASR injection and recovery wells. The commission may not adopt or enforce groundwater protection standards for the quality of water injected that are more stringent than federal standards. New TWC, §27.155 requires an ASR project operator to install a meter on each ASR injection and recovery well associated with the ASR project. The project operator also must provide monthly reports to the commission on the volume of water injected, and the volume of water recovered for beneficial use. New TWC, §27.156 requires an ASR operator to perform annual water quality testing on water to be injected and on recovered water, and to provide testing results to the commission. New TWC, §27.157 provides that new TWC, Chapter 27, Subchapter G does not affect the ability to regulate an ASR project under specific legislation applicable to the Edwards Aquifer Authority, the Harris-Galveston Subsidence District, the Fort Bend Subsidence District, the Barton Springs Edwards Aquifer Conservation District, or the Corpus Christi Aquifer Storage and Recovery Conservation District. New TWC, Chapter 27, Subchapter G, does not affect the commission's authority regarding recharge projects in certain portions of the Edwards underground reservoir under TWC, §11.023 or injection wells that transect or terminate in certain portions of the Edwards Aquifer under TWC, §27.0516.

In corresponding rulemaking published in this issue of the *Texas Register*, the commission also adopts revisions to 30 TAC Chapter 39, Public Notice; 30 TAC Chapter 295, Water Rights, Procedural; and 30 TAC Chapter 297, Water Rights, Substantive.

Section by Section Discussion

In addition to adopting amendments to implement HB 655, the commission adopts grammatical, stylistic, and various other non-substantive changes to update the rules in accordance with current *Texas Register* style and format requirements, improve readability, and establish consistency in the rules. These non-substantive changes are not intended to alter the existing rule requirements in any way and are not specifically discussed in this preamble.

§331.2, Definitions

The commission adopts an amendment to §331.2 to implement HB 655 new definitions established in TWC, §27.151. Section 331.2 is amended to add definitions for the following terms: "Aquifer storage and recovery injection well," "Aquifer storage and recovery production well," "Aquifer storage and recovery project," "Native groundwater," and "Project operator." The existing definition for the term "Aquifer storage well" is amended to "Aquifer storage and recovery," as the amended definitions for the terms "Aquifer storage and recovery injection well" and "Aquifer storage and recovery production well" now supersede the existing definition for "Aquifer storage well." Existing definitions in this section are renumbered accordingly.

§331.7, Permit Required

The commission adopts the amendment to §331.7 to add subsection (h), under which a

Class V injection well associated with an ASR project may be authorized by permit, general permit, or authorization by rule. Adopted §331.7(h) implements TWC, §27.153(a). The commission expects that most ASR projects can be authorized by rule as provided in HB 655 and as allowed for Class V injection wells under the commission's UIC program approved by the United States Environmental Protection Agency (EPA) under the federal Safe Drinking Water Act. Under existing authority in §331.9(c), the executive director may require the owner or operator of an injection well otherwise authorized by rule to apply for and obtain an injection well permit. The executive director may use this authority, on a case-by-case basis, to require that an owner or operator of ASR project seek authorization under a permit rather than by rule. Because the commission expects that most ASR projects can be authorized by rule, the commission does not plan to develop a general permit for ASR at this time.

Based on comments received, the proposed rule is amended to refer to "individual permit" in the adopted rule, as the term "individual permit" is consistent with TWC, §27.153(a)(2). Additionally, based on comments received, adopted §331.7(h) includes the requirements that the executive director inform a groundwater conservation district of any ASR project proposed to be authorized by rule for a project that is located within that district. Lastly, proposed §331.7(h) was amended at adoption to state that Class V injection well associated with an ASR project may be "authorized by individual permit, general permit, or by rule" rather than "authorized by permit, general permit, or by permit-by-rule." "Permit-by-rule" is not a term used to describe authorizations under Chapter 331. This change will make the

adopted rule consistent with TWC, §27.153(a)(1).

§331.11, Classification of Injection Wells

The commission adopts the amendment to §331.11(a)(4)(L) to refer to wells used for the injection of water for storage and subsequent retrieval for beneficial use as part of an ASR project. Revision of the description of this type of Class V well addresses the adopted definition for the term "Aquifer storage and recovery injection well" at §331.2(9).

Subchapter K, Additional Requirements for Class V Injection Wells Associated with Aquifer Storage and Recovery Projects

The commission adopts amending the title of Subchapter K from "Additional Requirements for Class V Aquifer Storage Wells" to "Additional Requirements for Class V Injection Wells Associated with Aquifer Storage and Recovery Projects." This adopted amendment is necessary for consistency with the adopted definition for the term "Aquifer storage and recovery injection well."

§331.181, Applicability

The commission adopts the amendment to §331.181 to refer to "Class V aquifer storage and recovery injection wells" instead of "aquifer storage wells" to be consistent with the adopted definition for "Aquifer storage and recovery injection well" at §331.2(9) and with the adopted amendment to §331.11(a)(4)(L) regarding the classification of Class V wells used for ASR.

§331.182, Area of Review

The commission adopts the amendment of §331.182 to remove the area of review determination for a Phase I Class V aquifer storage well, as the requirement for a pilot project (Phase I) was repealed from TWC, §11.153(b) and (c) under HB 655. The area of review requirements that applied to the Phase II aquifer storage well is retained and will apply to an ASR project. The commission adopts §331.182(4) to require an applicant for an authorization to provide all of the information to the executive director that is required under adopted §331.186(a) to implement TWC, §27.153(b), as amended by HB 655.

Based on comments received, the commission revised the rule to specify that the area of review for an ASR project is the area determined by a radius of 1/2 mile from the proposed ASR injection well. For an ASR project that includes more than one proposed injection well, the area of review in the adopted rule is the area determined by a radius of 1/2 mile from the centroid of the injection well field. In a case where the extent of the underground stored water of the ASR project will exceed the area determined by the 1/2 mile radius, the adopted rule includes the requirement that the area of review is the area determined by the projected extent of the underground stored water as calculated by using site-specific hydrogeologic information. Additionally, based on comments received, the adopted rule refers to "water" rather than "state water."

§331.183, Construction and Closure Standards

The commission adopts the amendment to §331.183 to refer to "aquifer storage and recovery injection wells" rather than "aquifer storage wells" to be consistent with the adopted definition for "Aquifer storage and recovery injection wells" at §331.2(9) and with the adopted amendment to §331.11(a)(4)(L) regarding the classification of Class V injection wells used for ASR. The commission also adopts an amendment to this section to revise the term "operator" to "project operator" to be consistent with the latter term as it is defined in adopted §331.2(92). Lastly, the commission adopts §331.183(4) and (5). Under adopted §331.183(4), an ASR injection well may be used as an ASR production well, as specified in TWC, §27.154(c), as added by HB 655. To maintain consistency with existing 30 TAC §290.41, which applies to water wells that are used to supply water to a public water system, adopted paragraph (4) includes the requirement that an ASR injection well that also is used as an ASR production well must be constructed and operated in accordance with the requirements in §290.41 if the recovered water will serve a public water system.

Adopted §331.183(5) addresses TWC, §27.153(c), as added by HB 655, under which all wells associated with an ASR project must be within a continuous perimeter boundary of one parcel of land, or within two or more adjacent parcels of land under the common ownership, lease, joint operating agreement, or contract.

Based on comments received, proposed §331.183(4) was amended to apply to all ASR production wells, not just those that serve as both an ASR injection well and an ASR production well.

§331.184, Operating Requirements

The commission adopts the amendment of §331.184 to refer to "aquifer storage and recovery injection wells" rather than "aquifer storage wells" to be consistent with the adopted definition for "Aquifer storage and recovery injection wells" at §331.2(9) and with the adopted amendment to §331.11(a)(4)(L) regarding the classification of Class V wells used for ASR. The commission adopts the amendment of §331.184(e) to remove the requirement that water injected for storage and subsequent recovery for beneficial use must meet the water quality standards in 30 TAC Chapter 290, Public Drinking Water.

The commission adds §331.184(f), under which all ASR injection and production wells must be installed with a flow meter for measuring the volume of water injected and the volume of the water recovered or produced. Section 331.184(f) implements TWC, §27.155(a), as added by HB 655.

The commission adds §331.184(g) to address the requirements of TWC, §27.154(b), as added by HB 655. Under adopted §331.184(g), the requirements of TWC, Chapter 36, Subchapter N apply to an ASR project that is within the jurisdiction of a groundwater conservation district or other special-purpose district with the authority to regulate the withdrawal of groundwater. For ASR projects located within the jurisdiction of a district, the commission will not authorize the recovery of a volume of water that exceeds the volume of water injected as provided in TWC, §27.154(b). Under TWC, Chapter 36,

Subchapter N, an ASR operator is subject to a district's requirements for registration and reporting of ASR production wells; reporting of injection and production volumes; reporting of volume of water produced that exceeds the volume injected; district permitting, spacing, and production requirements for volume of produced water that exceeds the volume of water injected; and the district's requirements regarding fees and surcharges, as they apply to the volume of water produced that exceed the volume of water injected.

Based on comments received, several revisions were made to this section. Section 331.184(a) was revised to remove the reference to pollution. In adopted §331.184(a), all Class V ASR injection wells must be operated in a manner to assure that injection will not endanger drinking water sources if it may result in the presence in underground water which supplies or can reasonably be expected to supply any public water system of any contaminant, and if the presence of such contaminant may result in such system's not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons. This change makes §331.184(a) consistent with HB 655, as the revised language is consistent with the federal Safe Drinking Water Act, §1421(d)(2). Second, §331.184(e) was revised to remove the requirements regarding treatment of water prior to injection when such treatment was considered to be necessary to avoid pollution of native groundwater. Section 331.184(e) was revised in the adopted rule to reference the requirements of §331.186(a)(1). As discussed in the Response to Comments section of this preamble, this change was made to make the adopted rule consistent with HB 655. The

requirement of subsection (e) that water that will be recovered from an ASR and provided to a public water system be subject to applicable requirements of Chapter 290 is retained in the adopted rule. Section 331.184(g)(1) was revised at adoption to specify that an authorization or permit issued under Chapter 331 may not authorize a volume of water to be recovered that exceeds the volume of water that is injected, or the volume of injected water that the commission determines can be recovered, whichever is less. Section 331.184(g)(2) was revised also to specify that the requirements of TWC, Chapter 36, Subchapter N apply to the volume of water recovered from an ASR project that exceeds the volume of water the commission determines can be recovered, and otherwise as applicable. Section 331.184(g)(3) was deleted.

§331.185, Monitoring and Reporting Requirements

The commission adopts the amendment of §331.185(a) to replace the requirement for quarterly reporting to the TCEQ with monthly reporting. The commission amends subsection (a) to include requirements for reporting of the volume of water injected for storage, and for the reporting of the volume of water produced for beneficial use, as required under TWC, §27.155, as added by HB 655. Reporting of monthly average injection pressures and reporting of other information, as required by the executive director, necessary for protection of underground sources of drinking water are retained. The commission adopts amendments to remove the existing requirement in §331.185(a)(4) for monthly reporting of water quality analyses of injected water. TWC, §27.156, added by HB 655, requires water quality testing on an annual basis, which is now required under the

adopted amendment to §331.185(b), discussed in this Section by Section Discussion.

The commission adopts the amendment to §331.185(b) to remove reference to the report required for Phase I of an ASR project, as this requirement has been removed from TWC, §11.153(b) and (c). The commission also amends §331.185(b) to require annual water quality testing and reporting as required under TWC, §27.156, as added by HB 655.

Based on comments received, the proposed rule is amended to refer to "individual permit" in the adopted rule, as the term "individual permit" is consistent with TWC, §27.153(a)(2).

§331.186, Additional Requirements

Existing requirements for regulating an ASR project in two phases (initial and final) was removed from TWC, §11.153(b) and (c) under HB 655. TCEQ now can authorize by rule, or issue individual or general permit for an ASR project without requiring a pilot project (Phase I). For this reason, the commission amends the title of §331.186 and deletes the requirement in §331.186 for submission of the information obtained during the first phase of an ASR project. The commission also adopts the amendment of §331.186 to refer to "aquifer storage and recovery injection wells" rather than "aquifer storage wells" to be consistent with the adopted definition for "Aquifer storage and recovery injection wells" at §331.2(9) and with the adopted amendment to §331.11(a)(4)(L) regarding the classification of Class V injection wells used for ASR. The commission adopts amendments to reorganize the sequence of existing §331.186 so that the information that was previously required to

be provided after Phase I is now provided to the executive director after the completion of the injection well in adopted §331.186(b).

The commission amends §331.186 by creating a subsection (a) to include factors the TCEQ (either the executive director when considering applications for individual, general permit, or authorizations by rule; or the commission when considering contested applications) shall consider when issuing a new permit for an ASR project. TCEQ must consider whether the injection of the water will comply with the standards set forth in the federal Safe Drinking Water Act; the extent to which the cumulative volume of water injected for storage can be recovered; the effect of the ASR project on existing water wells; and whether the introduction of water in the subsurface will alter the physical, chemical or biological quality of the native groundwater to a degree that would render produced water harmful or detrimental, or would require an unreasonable higher level of treatment to render the produced water suitable for beneficial use. Section 331.186(a) was revised to include the executive director's consideration of the factors specified in TWC, §27.153(a) and (b).

Adopted §331.186(a) implements TWC, §27.153(a) and (b), as added by HB 655.

Based on comments received, the proposed rule is amended to refer to "individual permit" in the adopted rule, as the term "individual permit" is consistent with TWC, §27.153(a)(2).

Final Regulatory Impact Analysis Determination

The commission reviewed the adopted rulemaking action in light of the regulatory analysis

requirements of Texas Government Code, §2001.0225, and determined that the action is not subject to Texas Government Code, §2001.0225 because it does not meet the definition of a "major environmental rule" as defined in the statute. "Major environmental rule" means a rule, the specific intent of which is to protect the environment or reduce risks to human health from environmental exposure and that may adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The adopted action implements legislative requirements in HB 655, which revises the requirements for the commission's regulation of injection wells associated with ASR projects. The adoption does not meet the definition of "major environmental rule" because the rulemaking does not adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment or public health and safety of the state or a sector of the state. Prior to the enactment of HB 655, the commission had previously authorized only two ASR projects and does not expect a great number of new projects. The adopted rules implement the legislative directives of HB 655 and do not impose additional regulatory burdens that would affect the economy or a sector of the economy in a material way.

Furthermore, the adopted rules do not meet any of the four applicability requirements listed in Texas Government Code, §2001.0225(a). The adopted rules do not exceed a standard set by federal law, because the adopted rules are consistent with applicable federal standards for Class V ASR injection wells. The adopted rules do not exceed an

express requirement of state law because the adopted rules are consistent with the express requirements of HB 655 and TWC, Chapter 27, Subchapter G. The adopted rules do not exceed requirements set out in the commission's UIC program authorized for the state of Texas under the federal Safe Drinking Water Act. The rulemaking is not adopted under the general powers of the agency, but is adopted under the express requirements of HB 655 and TWC, §§27.019, 27.153, and 27.154.

The commission invited public comment regarding the Draft Regulatory Impact Analysis Determination during the public comment period. No comments were received on the Draft Regulatory Impact Analysis Determination for the Chapter 331 rules.

Takings Impact Assessment

The commission evaluated this rulemaking action and performed a preliminary assessment of whether Texas Government Code, Chapter 2007 is applicable. The adopted action implements legislative requirements of HB 655, which revises the requirements for the commission's regulation of injection wells associated with ASR projects.

The adopted rules would be neither a statutory nor a constitutional taking of private real property. The adopted rules would establish conditions and requirement for certain injection activities associated with ASR projects, consistent with the requirements of HB 655. The adopted rulemaking does not affect a landowner's rights in private real property because this rulemaking action does not burden (constitutionally), nor restrict or limit, the

owner's right to property and reduce its value by 25% or more beyond which would otherwise exist in the absence of the regulations.

Consistency with the Coastal Management Program

The commission reviewed the adopted rules and found that they are neither identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(b)(2) or (4), nor will they affect any action/authorization identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11(a)(6). Therefore, the adopted rules are not subject to the Texas Coastal Management Program (CMP).

The commission invited public comment regarding the consistency with the CMP during the public comment period. No comments were received regarding the consistency with the CMP during the public comment period.

Public Comment

The commission held a public hearing on January 22, 2016. The comment period closed on February 8, 2016. The commission received comments from Benbrook Water Authority (Benbrook); Brazos Valley Groundwater Conservation District (Brazos Valley GWCD); Clearwater Underground Water Conservation District (Clearwater Underground WCD); Hemphill Underground Water Conservation District (Hemphill Underground WCD); High Plains Underground Water Conservation District (High Plains Underground WCD); the Honorable Lyle Larson, Texas State Representative, District 122, who authored HB 655

(Representative Larson); Llano Estacado Underground Water Conservation District (Llano Estacado Underground WCD); Lone Star Groundwater Conservation District (Lone Star GWCD); Mesa Underground Water Conservation District (Mesa Underground WCD); Permian Basin Underground Water Conservation District (Permian Basin Underground WCD); Prairielands Groundwater Conservation District (Prairielands GWCD); Sandy Land Underground Water Conservation District (Sandy Land Underground WCD); Sledge Law and Public Strategies (Sledge Law); South Plains Underground Water Conservation District (South Plains Underground WCD); Texas Alliance of Groundwater Districts; Texas Farm Bureau; and the Upper Trinity Groundwater Conservation District (Upper Trinity GWCD).

All commenters generally were in support of the proposed rules, although there were numerous suggested changes, as detailed in the Response to Comments section of this preamble. A common comment was that certain rules were not consistent with HB 655.

Response to Comments

General

Comment

Representative Larson, Hemphill Underground WCD, High Plains Underground WCD, Llano Estacado Underground WCD, Mesa Underground WCD, Permian Basin Underground WCD, Sandy Land Underground WCD, South Plains Underground WCD, Upper Trinity GWCD, Texas Farm Bureau, Prairielands GWCD, Upper Trinity GWCD,

Sledge Law, Benbrook, Texas Alliance of Groundwater Districts, and Lone Star GWCD commented that the proposed rules should be revised to ensure consistency with HB 655.

Response

The commission agrees that the adopted rules should be consistent with the provisions of HB 655. To ensure that these rules are consistent with HB 655, all comments were carefully reviewed, and, as detailed in the responses, changes to the proposed rules were made, as appropriate, to maintain consistency with HB 655.

Comment

Sledge Law commented that the preamble to this rulemaking did not include the Corpus Christi Aquifer Storage and Recovery Conservation District as an entity that new TWC, Chapter 27, Subchapter G does not affect regarding that districts ability to regulate groundwater.

Response

The commission agrees with this comment, as this entity was included in TWC, §27.157. The preamble to the adopted rules has been amended to include the Corpus Christi Aquifer Storage and Recovery Conservation District.

Subchapter A: General Provisions

§331.2, Definitions

Comment

The Hemphill Underground WCD, High Plains Underground WCD, Llano Estacado Underground WCD, Mesa Underground WCD, Permian Basin Underground WCD, Sandy Land Underground WCD, South Plains Underground WCD, and Upper Trinity GWCD commented that the commission did not use the exact terms in TWC, §27.151(2) and (3), as amended by HB 655, for the new definitions at §331.2(9) and (10), respectively, for the terms "ASR recovery well" and "ASR production well." Commenters suggested that to be consistent with HB 655, the commission use the terms in TWC, §27.151(2) and (3) in the new definitions, and that the terms in TWC, §27.151(2) and (3) be used throughout the Chapter 331 adopted rules.

Response

The commission acknowledges that the terms defined at §331.2(9) and (10) are not the exact terms used at TWC, §27.151(2) and (3), respectively, although the rule definition for each term is identical to the respective definition in TWC, §27.151(2) and (3). The proposed rule defined the term "Aquifer storage and recovery injection well" instead of the term "ASR injection well," used in TWC, §27.151(2). Similarly, the proposed rule defined the term "Aquifer storage and recovery production well" instead of the term "ASR recovery well," used in TWC, §27.151(3). The commission made these modifications to avoid a possible reference to an "aquifer storage and recovery recovery well."

The double "recovery" in this term could create confusion when the ASR acronym is stated in full. This modification does not deviate from the intent of the definitions at TWC, §27.151(2) and (3), as the actual definitions in the rules are identical to the respective definitions in TWC, §27.151(2) and (3). No changes were made in response to this comment.

§331.7, Permit Required

Comment

The Hemphill Underground WCD, High Plains Underground WCD, Llano Estacado Underground WCD, Mesa Underground WCD, Permian Basin Underground WCD, Sandy Land Underground WCD, and the South Plains Underground WCD commented that proposed §331.7(h) be revised to refer to "individual permit" rather than to "permit."

Response

The commission agrees with this comment, as the term "individual permit" is used in TWC, §27.153(a)(2). Adopted §331.7(h) is amended to refer to "individual permit" rather than to "permit." Additionally, as discussed in corresponding rulemaking for 30 TAC Chapter 39 published in this issue of the *Texas Register*, proposed §331.7(h) was amended at adoption to require that the executive director inform a groundwater conservation district of any ASR project proposed to be authorized by rule for a project that is located within that district. Lastly, proposed §331.7(h) was amended at adoption to

state that the commission may authorize an ASR project by individual permit, general permit, or by rule, rather than by individual permit, general permit, or permit-by-rule. This change will make the adopted rule consistent with TWC, §27.153(a), under which the commission may authorize the use of a Class V injection well as an ASR injection well under an individual permit, under a general permit, or by rule.

Subchapter K: Additional Requirements for Class V Injection Wells Associated With Aquifer Storage and Recovery Projects

§331.182, Area of Review

Comment

The Prairielands GWCD, Upper Trinity GWCD, Benbrook, Lone Star GWCD, and Sledge Law commented that proposed §331.182 should refer simply to "water" rather than to "state water," as management of water at an ASR project is not restricted to state water.

Response

The commission agrees with this comment. At TWC, §27.151(1), the term "aquifer storage and recovery project" is defined as a project involving the injection of *water* (emphasis added) into a geologic formation for the purpose of subsequent recovery and beneficial use by the project operator. As discussed in the following response to comments, proposed §331.182 has been revised to address how the area of review is determined. Based on those

comments, the reference to "state water" is amended to "water."

Comment

Benbrook commented that the proposed rule language at §331.182 regarding the area of review was unclear, and suggested the proposed rule be amended to adopt a default area of review, which they described as "a circle of a 1/2 mile radius." Benbrook commented that a typical ASR project has a radius of 200 feet. Benbrook further commented that if information submitted in the application indicated the extent of stored water was greater than the area described by a radius of 1/2 mile, the area of review could be extended. Benbrook stated that this recommendation is based on the difficulty and costs associated with determining the location of the "buffer zone" in order to establish a 1/4 mile area of review from the buffer zone.

Response

Prior to amendment of TWC by HB 655, the area of review was described in §331.182 as the area determined by a radius of 1/4 mile from the perimeter of a buffer zone as described under 30 TAC §295.22(e)(5). Under §295.22(e)(5), an application for an ASR project had to include "the location of a buffer zone surrounding the land surface area under which the underground storage of state water will occur and beyond which pumpage by other wells will not interfere or significantly affect the movement or storage of the state water." In a corresponding rulemaking for 30 TAC Chapter 295, published in this issue

of the *Texas Register*, the commission repeals §295.22. Although §295.22 was repealed, HB 655 did not remove the requirements that are in §331.182 regarding information in §331.182(1) - (3), which pertain to the area of review. That is to say, HB 655 did not remove the requirement for an area of review under existing §331.182. Additionally, an area of review is required to address the requirement at TWC, §27.153(b)(3), under which the commission shall consider the effect of the ASR project on existing water wells. In their comments, Benbrook stated that at a typical ASR project, the extent of the stored water is within an area with a radius of about 200 feet. Benbrook also stated that determination of a buffer zone is difficult and expensive, and that the area of review should be a circle of 1/2 mile radius (presumably centered on an ASR well or wells). The commission agrees that the area of review should be based on a distance from an identifiable feature; in this case, an ASR injection well, or, in the case of an ASR project for which there will be more than one injection well, the centroid of the injection well field. Benbrook also stated that the radius of a typical ASR project is approximately 200 feet. In consideration of this fact, the adopted rule identifies an area of review, defined as the area described by a radius of 1/2 mile from either the ASR injection well or from the centroid of the injection well field, as applicable. This requirement will address the existing requirements in §331.182, as well as the requirements in TWC, §27.153(b)(3). Based on comments from Benbrook, the adopted rule also is amended to specify that should the area of

injected water exceed an area determined by a radius of 1/2 mile from the ASR injection well or the well field centroid, the area of review will be determined by the projected extent of the underground stored water as calculated by using site-specific hydrogeologic information.

§331.183, Construction and Closure Standards

Comment

The Texas Farm Bureau commented that although the proposed rules adequately address injection of water, they do not address issues associated with production of water, and asked what mechanism will be used for monitoring production of water at an ASR project to ensure that native groundwater is not withdrawn. Prairielands GWCD commented that the proposed rules did not address regulation of ASR production wells, and that the adopted rules should include requirements for such wells. Upper Trinity GWCD commented that under HB 655, the commission was granted authority to regulate both ASR injection wells and ASR production wells. Benbrook and Lone Star GWCD commented that although the proposed rules address regulation of a well that serves as both an injection and production ASR well, they do not address requirements for wells that are only for production. The Brazos Valley GWCD commented that the commission now has authority over both ASR injection and production wells, and that this authority should be addressed in the rules.

Response

Standards for water wells are found in existing §290.41, and include construction and operating requirements. Under proposed §331.183(4), an ASR injection well that also serves as an ASR production well must comply with the applicable requirements in §290.41. To address this comment, adopted §331.183(4) has been revised to apply the requirements in §290.41 to all ASR production wells.

Comment

The Hemphill Underground WCD, High Plains Underground WCD, Llano Estacado Underground WCD, Mesa Underground WCD, Permian Basin Underground WCD, Sandy Land Underground WCD, and the South Plains Underground WCD commented that the qualifier "within" in proposed §331.183(5)(A) and (B) be removed and placed at the beginning of §331.183(5).

Response

Section 331.183(5)(A) and (B) is adopted to address the requirement at TWC, §27.153(c) that "all wells associated with a single aquifer storage and recovery project must be located within a continuous perimeter boundary of one parcel of land, or two or more adjacent parcels of land under common ownership, lease, joint operating agreement, or contract." The commission responds that the placement of the qualifier "within" at §331.183(5) adequately conveys the intent of TWC, §27.153(c). No changes were made in response to this

comment.

Comment

Brazos Valley GWCD commented that the proposed rules do not address a method to determine the amount of land required to be owned or controlled by an ASR operator.

Brazos Valley GWCD commented that the proposed rules should include a definitive method to address this issue, including determination of a buffer zone. Otherwise, according to Brazos Valley GWCD, the commission may have a situation involving "underground trespass." Lastly, Brazos Valley GWCD commented that ASR project operators need assurance that their injected water is protected from extraction by adjacent landowners.

Response

In accordance with proposed §331.183(5)(A) and (B), all ASR injection wells and all ASR production wells must be located within a continuous boundary of one parcel of land, or two or more adjacent parcels of land under common ownership, lease, joint operating agreement, or contract. An applicant for an ASR project will have to provide proof that this requirement is satisfied. Such information will be required in an ASR project application form. It is the responsibility of the applicant to ensure he or she has control of an adequate amount of property such that the planned ASR project is contained within that parcel of land. Given the importance of the injected water to an ASR

operator, it is in the interest of the ASR project manager to limit loss of any injected water and to acquire sufficient acreage for the ASR project to ensure, to the greatest extent possible, that his or her injected water does not migrate out of the ASR project, or that the injected water is not captured by an adjacent landowner. The commission notes that the purpose of the area of review requirements at amended §331.182 is to address issues related to operation of an ASR project. No change was made in response to this comment.

§331.184, Operating Requirements

Comment

Representative Larson commented that with respect to TWC, §27.153(b) and §27.154(d) regarding assessment of water quality impacts, the commission rules should allow for consideration of natural processes that occur in an aquifer, as such a consideration is consistent with EPA policy and reasonable interpretations of federal law. Representative Larson further commented that the rules should provide flexibility to evaluate drinking water standards at a logical distance from an ASR injection well. Representative Larson stated that an ASR project manager should be allowed to propose monitoring and testing to evaluate the effects injected water may have on groundwater. Such testing and monitoring would enable the operator to consider microbial, geochemical, and physical processes that occur in the aquifer when assessing whether or not injection will cause a violation of TWC, §27.153(b)(4). Prairielands GWCD commented that proposed

§331.184(e) should be amended to be consistent with the statutory test regarding commission consideration of water quality impacts established in TWC, §27.153(b). Sledge Law, Benbrook, Clearwater Underground WCD, and the Upper Trinity GWCD commented that proposed §331.184(a) and (e) are inconsistent with the statutory test set forth in HB 655, and that the terms "pollution" and "pathogens and other organisms" are not used in HB 655. Upper Trinity GWCD, Texas Alliance of Groundwater Districts, and Clearwater Underground WCD commented that proposed §331.184(a) and (e) should be amended to be consistent with the statutory test established in TWC, §27.153(b)(4) and §27.154(d). Sledge Law commented that there have been recent public written interpretations by the EPA regarding standards for ASR projects, and that these comments were carefully considered by the Texas Water Conservation Association Committee and the Texas Legislature in development of HB 655. Sledge Law further commented that the demonstration an applicant for an ASR project must make is in TWC, §27.154(d). Benbrook commented that the rules should allow applicants for an ASR project the flexibility to propose monitoring and testing of water quality impacts, with consideration of natural processes, including microbial, geochemical, and geophysical processes that occur underground that provide treatment of injected water. Benbrook commented that this approach is consistent with current EPA policy and also is a reasonable interpretation of federal laws that apply to UIC. Additionally, Benbrook commented that state rules regarding regulation of ASR projects should not be more stringent than federal requirements regarding water quality testing for ASR projects. Benbrook commented that the commission should allow, as does EPA, for situations to be addressed on a case-by-case

basis to allow for ASR project operations that may cause a violation of primary drinking water regulations under 40 Code of Federal Regulations (CFR) Part 142 on the ASR site, but that are managed in such a manner as to prevent any off-site endangerment as described in the federal Safe Drinking Water Act at §1421(d)(2). Lone Star GWCD commented that proposed §331.184(e) be amended to be consistent with HB 655 regarding water quality impacts.

Response

The commission acknowledges that the term "pollution" is not used in HB 655. In response to this comment, the commission revised the language in §331.184(a) to mirror the language in the federal Safe Drinking Water Act §1421(d)(2). Section 331.184(e) has also been revised.

With regards to the comment that the commission should allow, as does the EPA, for situations to be addressed on a case-by-case basis to allow for ASR project operations that may cause a violation of primary drinking water regulations under 40 CFR Part 142 on the ASR site, but that are managed in such a manner as to prevent any off-site endangerment as described in the federal Safe Drinking Water Act at §1421(d)(2), the commission accepts the findings in the September 27, 2013, letter to Mr. Mark Thomasson, Director of the Division of Water Resource Management of the Florida Department of Environmental Protection from Dr. Peter Grevatt, Director of the EPA's Office

of Ground Water and Drinking Water. This letter addresses the situation in Florida where injection of treated drinking water at ASR facilities has resulted in leaching of arsenic from the formation material of the aquifer in which the water was injected. In this letter, Dr. Grevatt states that this situation, which technically is a violation of a primary drinking water standard, is allowed under federal regulations provided the ASR operator institutes controls to restrict the occurrence and migration of the arsenic. As noted by Dr. Grevatt in this letter, this situation should be addressed by issuance of a Class V UIC permit for the Class V UIC wells associated with the ASR project.

The commission accepts the findings in Dr. Grevatt's letter, and notes in his conclusion he states that the purpose of the letter is to explain how Safe Drinking Water Act and UIC regulations allow states to address water shortages and at the same time protect the quality of future water supplies. Further, although this letter does not address the specific case presented by the commenter regarding reliance of natural attenuation and geochemical processes in the subsurface to control certain constituents in the injected water, the commission agrees that these processes may be considered in authorizing an ASR project. On a case-by-case basis, the commission may consider the effects of natural processes including microbial, geochemical, and geophysical process in the subsurface. To evaluate the effects of these processes, the commission may require controls such as monitoring and

testing of the injected water. To provide maximum flexibility to operators regarding consideration of these processes, the commission will rely on adopted §331.186(a)(1). The commission, before issuing an individual permit, general permit, or authorization by rule for an ASR project, will consider whether the injection of water will comply with the standards set forth under the federal Safe Drinking Water Act (42 United States Code, §§300f, *et seq.*). This approach allows flexibility in the ASR authorization process to consider the factors presented by commenters, and to consider other factors that may be appropriate on a case-by-case basis. Finally, the adopted rule is consistent with TWC, §27.153(b) and §27.154(d), as amended by HB 655.

The commission is amending §331.184(e) in the adopted rule to remove reference to "pathogens," and to include the requirements in TWC, §27.153(b), in which the federal Safe Drinking Water Act (42 USC, §§300f *et seq.*); is specifically referenced. By doing this, the commission may, on a case-by-case basis, consider proposed ASR projects with respect to determinations of how the requirements of §331.5 and 40 CFR §144.12(a) are met. In making such a determination, the commission may rely on EPA policy memoranda, EPA guidance, or case law.

Comment

The Texas Farm Bureau commented that for an ASR project located with the jurisdiction of

a groundwater conservation district, that district should receive all water quality data required by the commission. Additionally, the Texas Farm Bureau commented that any adjacent district also should receive these data. Benbrook commented that local authority (presumably the groundwater conservation district) should receive monthly water quantity and water quality reports.

Response

In accordance with TWC, §36.453(b), for an ASR project within the jurisdiction of a groundwater conservation district, if an ASR project operator produces more water than was authorized by TCEQ, that operator must report to the district the volume of water produced that exceeds the volume authorized to be recovered. The ASR operator also must provide a monthly report that includes the information required under TWC, §27.155. These requirements are addressed in adopted §331.184(g), under which an ASR project is subject to TWC, Chapter 36, Subchapter N. With regards to reporting of water data to an adjacent groundwater conservation district, no such requirement is included in HB 655. No changes were made in response to this comment.

Comment

The Texas Farm Bureau and Upper Trinity GWCD commented that all ASR production wells within the jurisdiction of a groundwater conservation district, not just those that

produce a volume of water in excess of the volume of water injected, must comply with the requirements of TWC, Chapter 36, Subchapter N.

Response

Enforcement of the specific requirements in TWC, Chapter 36, Subchapter N (or any provisions in TWC, Chapter 36, for that matter) is the responsibility of the individual groundwater conservation districts, not the commission. The commission does not have the authority to compel an ASR project operator to pay fees imposed by a district, for example. With regards to application of TWC, Chapter 36, Subchapter N, the commission cannot prohibit the production of native groundwater by an ASR project if the production complies with TWC, Chapter 36, Subchapter N. To address this consideration, the commission proposed §331.184(g). No changes were made in response to this comment.

Comment

The Hemphill Underground WCD, High Plains Underground WCD, Llano Estacado Underground WCD, Mesa Underground WCD, Permian Basin Underground WCD, Sandy Land Underground WCD, and the South Plains Underground WCD commented that proposed §331.184(g)(3) be amended to specify that a project manager of an ASR project "shall," rather than "may" be subject to registration, reporting, fee or other requirements of a groundwater conservation district or other special-purpose district with the authority to

regulate the withdrawal of water. Lone Star GWCD commented that §331.184(g) should be clarified that an ASR project in the jurisdiction of a groundwater conservation district or other special-purpose district with authority to regulate withdrawal of groundwater is subject to the requirements of TWC, Chapter 36, Subchapter N.

Response

Section 331.184(g)(3) was proposed to address the requirement in TWC, §27.154(b), under which an ASR project located within the jurisdiction of a groundwater conservation district or other special-purpose district with authority to regulate the withdrawal of water is subject to the requirements of TWC, Chapter 36, Subchapter N. The proposed rule was intended to summarize certain TWC, Chapter 36, Subchapter N requirements. However, based on this comment, the commission has revisited this rule, and finds it does not adequately capture the intent of TWC, Chapter 36, Subchapter N. Therefore, in the adopted rule, §331.184(g)(3) is removed, and §331.184(g)(2) references TWC, Chapter 36, Subchapter N. Additionally, §331.184(g)(2) is revised to apply to the volume of water recovered that exceeds the volume of water the commission determines can be recovered. These revisions will remove any ambiguity regarding the requirements for an ASR project located within the jurisdiction of a groundwater conservation district or other special-purpose district with authority to regulate the withdrawal of water.

§331.185, Monitoring and Reporting Requirements

Comment

The Texas Farm Bureau commented by asking what is the mechanism for monitoring withdrawals from ASR projects to ensure that injected water and not native groundwater is being withdrawn. The Farm Bureau further commented that this is a critical question because withdrawal of native groundwater subject to the rules of a groundwater conservation district or other special-purpose district with authority to regulate withdrawal of groundwater. Lastly, the Texas Farm Bureau commented that monitor wells, operated by local groundwater districts, should be required within a buffer zone of an ASR project. Clearwater Underground WCD and Texas Alliance of Groundwater Districts commented that a mechanism or protocol by which a groundwater conservation district's groundwater monitoring network might be leveraged to detect injected water migration should be strongly considered by the commission

Response

The monitoring of the amount of water produced in association with an ASR project is addressed in proposed §331.185(a)(1) and (2). Under these rules, an ASR operator must report to the commission the volume of water injected for storage and the volume of water recovered for beneficial use. Also, under §331.184(g)(2), an operator of an ASR project that is within the jurisdiction of an groundwater conservation district is subject to TWC, Chapter 36, Subchapter N for the amount of water produced that exceeds the volume of

water that the commission determines can be recovered. With regards to monitor wells completed on the periphery of an ASR project, with the purpose of detecting movement of injected water that may migrate offsite, the commission could require such monitor wells as part of an ASR project in cases where such monitoring may be needed. However, the requirement for an ASR operator to install and operate such wells would be determined on a case-by-case basis, depending on local geology and hydrogeology. Any monitor wells installed as part of an ASR project would be operated by the ASR operator, not a groundwater conservation district. No changes were made in response to this comment.

Comment

The Hemphill Underground WCD, High Plains Underground WCD, Llano Estacado Underground WCD, Mesa Underground WCD, Permian Basin Underground WCD, Sandy Land Underground WCD, and the South Plains Underground WCD commented that proposed §331.185(b) should refer to an "individual permit" rather than to a "permit," and also should refer to an "authorization by rule" rather than to an "authorization."

Response

The commission agrees with these suggested changes, and the adopted rule was revised to refer to an "individual permit" rather than to a "permit," and to an "authorization by rule" rather than to an "authorization."

§331.186, Additional Requirements

Comment

Upper Trinity GWCD, Sledge Law, and Brazos Valley GWCD commented that proposed §331.186 (regarding the factors the commission shall consider before authorizing an ASR project) applied to applications for individual permits and for authorization under a general permit, but not to an application for authorization of an ASR project by rule. These entities commented that the requirements of §331.186 should also apply to an application for authorization of an ASR project by rule.

Response

The commission agrees with this comment. The factors the commission or executive director must consider regarding authorization of an ASR project apply to permits (individual and general) and to an authorization by rule (TWC, §27.153(b)). Based on this comment, adopted §331.186(a) is amended to apply to an application for an individual permit, a general permit, or an authorization by rule and includes the executive director's consideration.

Comment

Prairielands GWCD, Lone Star GWCD, and Upper Trinity GWCD commented that the proposed rules in Chapter 331 should be revised to require the commission to make a determination of how much of the injected water can be recovered by an ASR project

operator to account for any loss of injected water. Prairieland GWCD commented that this accounting by the commission is important to ensure that native groundwater is not produced without complying with local district restriction, and that such an accounting should be consistently reflected in the rules.

Response

As discussed subsequently in this Response to Comments, proposed §331.186(a) has been revised to require the commission, prior to authorizing an ASR project by individual permit, general permit, or by rule, shall consider the extent to which the cumulative volume of water injected for storage in the receiving geologic formation can be successfully recovered from the geologic formation for beneficial use, taking into account that the injected water may be comingled to some degree with native groundwater. The commission responds that in considering these factors, it is in fact making the determination required in TWC, §27.154(b). The commission notes that this determination will be made on information provided by the applicant, and that no determination will be made until sufficient information is provided by the applicant. For projects within the jurisdiction of a groundwater conservation district, §331.184(g)(1) was revised to provide that an authorization or permit may not authorize a volume of water to be recovered that exceeds the volume of water that is injected or the volume of injected water that the commission determines can be recovered.

Comment

Upper Trinity GWCD commented that the proposed rules require that ASR production wells be included in an ASR project permit or authorization by rule.

Response

At TWC, §27.154(c), the commission is directed to adopt rules for the construction and completion standards and metering and reporting requirements for ASR injection wells and ASR recovery wells, including an ASR injection well that also serves as an ASR production well. Construction and completion of an ASR injection well are addressed in existing Chapter 331, Subchapter H (Standards for Class V Wells). Standards for construction and completion of an ASR production well are addressed in existing §290.41, and are referenced in adopted §331.183(4), as are ASR injection wells that also serve as an ASR production well. The commission notes that ASR injection wells will be authorized under a Class V UIC individual permit, general permit, or by rule. While TCEQ has exclusive jurisdiction over ASR injection wells under TWC, §27.152, other regulatory entities, such as the Texas Department of Licensing and Regulation, may be involved with the regulation of water wells. ASR production wells associated with a Class V ASR permit or authorization by rule will be identified in that permit or authorization. No changes were made in response to this comment.

Comment

Clearwater Underground WCD and Texas Alliance of Groundwater Districts commented that regular water quality monitoring that includes geochemical analysis and project evaluation should be required. Clearwater Underground WCD also commented that sufficient water quality testing should be considered for the receiving aquifer prior to ASR project authorization.

Response

In accordance with TWC, §27.156, an ASR project manager shall perform annual water quality testing on water to be injected and on produced water. This requirement is included in adopted §331.185(b). The commission agrees that the quality of the groundwater in the receiving aquifer should be adequately characterized prior to any injection. No changes were made in response to this comment.

Comment

Clearwater Underground WCD and Texas Alliance of Groundwater Districts commented that regular monitoring and modeling of water migration is necessary in order to define jurisdictional boundaries between ASR recovery and neighboring groundwater production.

Response

TCEQ has exclusive jurisdiction over the regulation and permitting of ASR injection wells. Well location requirements for an ASR project are established under adopted §331.183(5). A project operator will be required to demonstrate the extent to which the cumulative volume of water injected for storage in the receiving formation can be successfully recovered, taking into account that injected water may be commingled to some degree with native groundwater. If that ASR project is within the jurisdiction of a groundwater conservation district or other special-purpose district with authority to regulate withdrawal of water, then the applicable requirements of TWC, Chapter 36, Subchapter N apply. No changes were made in response to this comment.

SUBCHAPTER A: GENERAL PROVISIONS

§§331.2, 331.7, 331.11

Statutory Authority

The amendments are adopted under Texas Water Code (TWC), §5.103, which provides the commission the authority to adopt any rules necessary to carry out its powers and duties under TWC and other laws of this state; TWC, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; TWC, §5.120, which authorizes the commission to administer the law so as to promote the judicious use and maximum conservation and protection of the environment and natural resources of the state; TWC, §27.019, which requires the commission to adopt rules reasonably required for the regulation of injection wells; TWC, §27.153, which requires the commission to adopt rules for authorization of aquifer storage and recovery injection wells by rule or by permit; and TWC, §27.154, which requires the commission to adopt technical standards for aquifer storage and recovery injection wells.

The adopted amendments implement House Bill 655, 84th Texas Legislature, 2015, and TWC, Chapter 27, Subchapter G, which confers commission jurisdiction and establishes requirements for injection wells associated with aquifer storage and recovery projects.

§331.2. Definitions.

General definitions can be found in Chapter 3 of this title (relating to Definitions).
The following words and terms, when used in this chapter, have the following meanings.

(1) Abandoned well--A well which has been permanently discontinued from use or a well for which, after appropriate review and evaluation by the commission, there is no reasonable expectation of a return to service.

(2) Activity--The construction or operation of any of the following:

(A) an injection well for disposal of waste;

(B) an injection or production well for the recovery of minerals;

(C) a monitor well at a Class III injection well site;

(D) pre-injection units for processing or storage of waste; or

(E) any other class of injection well regulated by the commission.

(3) Affected person--Any person who has a personal justiciable interest related to a legal right, duty, privilege, power, or economic interest affected by the proposed injection operation for which a permit is sought.

(4) Annulus--The space in the wellbore between the injection tubing and the long string casing and/or liner.

(5) Annulus pressure differential--The difference between the annulus pressure and the injection pressure in an injection well.

(6) Aquifer--A geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.

(7) Aquifer restoration--The process used to achieve or exceed water quality levels established by the commission for a permit/production area.

(8) Aquifer storage and recovery--The injection of water into a geologic formation, group of formations, or part of a formation that is capable of underground storage of water for later retrieval and beneficial use.

(9) Aquifer storage and recovery injection well--A Class V injection well used for the injection of water into a geologic formation as part of an aquifer storage and recovery project.

(10) Aquifer storage and recovery production well--A well used for the production of water from a geologic formation as part of an aquifer storage and recovery project.

(11) Aquifer storage and recovery project--A project involving the injection of water into a geologic formation for the purpose of subsequent recovery and beneficial use by the project operator.

(12) Area of review--The area surrounding an injection well described according to the criteria set forth in §331.42 of this title (relating to Area of Review) or in the case of an area permit, the project area plus a circumscribing area the width of which is either 1/4 mile or a number calculated according to the criteria set forth in §331.42 of this title.

(13) Area permit--A permit that authorizes the construction and operation of two or more similar injection, production, or monitoring wells used in operations associated with Class III well activities within a specified area.

(14) Artificial liner--The impermeable lining of a pit, lagoon, pond, reservoir, or other impoundment, that is made of a synthetic material such as butyl rubber, chlorosulfonated polyethylene, elasticized polyolefin, polyvinyl chloride (PVC), other manmade materials, or similar materials.

(15) Baseline quality--The parameters and their concentrations that describe the local groundwater quality of an aquifer prior to the beginning of injection operations.

(16) Baseline well--A well from which groundwater is analyzed to define baseline quality in the permit area (regional baseline well) or in the production area (production area baseline well).

(17) Bedded salt--A geologic formation, group of formations, or part of a formation consisting of non-domal salt that is layered and may be interspersed with non-salt sedimentary materials such as anhydrite, shale, dolomite, and limestone. The salt layers themselves often contain significant impurities.

(18) Bedded salt cavern disposal well--A well or group of wells and connecting storage cavities which have been created by solution mining, dissolving or excavation of salt bearing deposits or other geological formations and subsequently developed for the purpose of disposal of nonhazardous drinking water treatment residuals.

(19) Blanket material or blanket pad--A fluid placed within a salt cavern that is lighter than the water in the cavern and will not dissolve the salt or any mineral impurities that may be contained within the salt. The function of the blanket is to prevent unwanted leaching of the salt cavern roof, prevent leaching of salt from around the

cemented casing, and to protect the cemented casing from internal corrosion. Blanket material typically consists of crude oil, mineral oil, or some fluid possessing similar noncorrosive, nonsoluble, low density properties. The blanket material is placed between the salt cavern's outermost hanging string and innermost cemented casing.

(20) Buffer area--The area between any mine area boundary and the permit area boundary.

(21) Caprock--A geologic formation typically overlying the crest and sides of a salt stock. The caprock consists of a complex assemblage of minerals including calcite (CaCO_3), anhydrite (CaSO_4), and accessory minerals. Caprocks often contain lost circulation zones characterized by rock layers of high porosity and permeability.

(22) Captured facility--A manufacturing or production facility that generates an industrial solid waste or hazardous waste that is routinely stored, processed, or disposed of on a shared basis in an integrated waste management unit owned, operated by, and located within a contiguous manufacturing complex.

(23) Casing--Material lining used to seal off strata at and below the earth's surface.

(24) Cement--A substance generally introduced as a slurry into a wellbore which sets up and hardens between the casing and borehole and/or between casing strings to prevent movement of fluids within or adjacent to a borehole, or a similar substance used in plugging a well.

(25) Cementing--The operation whereby cement is introduced into a wellbore and/or forced behind the casing.

(26) Cesspool--A drywell that receives untreated sanitary waste containing human excreta, and which sometimes has an open bottom and/or perforated sides.

(27) Commercial facility--A Class I permitted facility, where one or more commercial wells are operated.

(28) Commercial underground injection control (UIC) Class I well facility-- Any waste management facility that accepts, for a charge, hazardous or nonhazardous industrial solid waste for disposal in a UIC Class I injection well, except a captured facility or a facility that accepts waste only from other facilities owned or effectively controlled by the same person.

(29) Commercial well--An underground injection control Class I injection well which disposes of hazardous or nonhazardous industrial solid wastes, for a charge,

except for a captured facility or a facility that accepts waste only from facilities owned or effectively controlled by the same person.

(30) Conductor casing or conductor pipe--A short string of large-diameter casing used to keep the top of the wellbore open during drilling operations.

(31) Cone of influence--The potentiometric surface area around the injection well within which increased injection zone pressures caused by injection of wastes would be sufficient to drive fluids into an underground source of drinking water or freshwater aquifer.

(32) Confining zone--A part of a formation, a formation, or group of formations between the injection zone and the lowermost underground source of drinking water or freshwater aquifer that acts as a barrier to the movement of fluids out of the injection zone.

(33) Contaminant--Any physical, biological, chemical, or radiological substance or matter in water.

(34) Control parameter--Any physical parameter or chemical constituent of groundwater monitored on a routine basis used to detect or confirm the presence of

mining solutions in a designated monitor well. Monitoring includes measurement with field instrumentation or sample collection and laboratory analysis.

(35) Desalination brine--The waste stream produced by a desalination operation containing concentrated salt water, other naturally occurring impurities, and additives used in the operation and maintenance of a desalination operation.

(36) Desalination concentrate--Same as desalination brine.

(37) Desalination operation--A process which produces water of usable quality by desalination.

(38) Disposal well--A well that is used for the disposal of waste into a subsurface stratum.

(39) Disturbed salt zone--Zone of salt enveloping a salt dome cavern, typified by increased values of permeability or other induced anomalous conditions relative to undisturbed salt which lies more distant from the salt dome cavern, and is the result of mining activities during salt dome cavern development and which may vary in extent through all phases of a cavern including the post-closure phase.

(40) Drilling mud--A heavy suspension used in drilling an injection well, introduced down the drill pipe and through the drill bit.

(41) Drinking water treatment residuals--Materials generated, concentrated or produced as a result of treating water for human consumption.

(42) Drywell--A well, other than an improved sinkhole or subsurface fluid distribution system, completed above the water table so that its bottom and sides are typically dry except when receiving fluids.

(43) Enhanced oil recovery project (EOR)--The use of any process for the displacement of oil from the reservoir other than primary recovery and includes the use of an immiscible, miscible, chemical, thermal, or biological process. This term does not include pressure maintenance or water disposal projects.

(44) Excursion--The movement of mining solutions, as determined by analysis for control parameters, into a designated monitor well.

(45) Existing injection well--A Class I well which was authorized by an approved state or United States Environmental Protection Agency-administered program before August 25, 1988, or a well which has become a Class I well as a result of a change in

the definition of the injected waste which would render the waste hazardous under §335.1 of this title (relating to Definitions).

(46) Fluid--Material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state.

(47) Formation--A body of rock characterized by a degree of lithologic homogeneity which is prevailing, but not necessarily, tabular and is mappable on the earth's surface or traceable in the subsurface.

(48) Formation fluid--Fluid present in a formation under natural conditions.

(49) Fresh water--Water having bacteriological, physical, and chemical properties which make it suitable and feasible for beneficial use for any lawful purpose.

(A) For the purposes of this chapter, it will be presumed that water is suitable and feasible for beneficial use for any lawful purpose only if:

(i) it is used as drinking water for human consumption; or

(ii) the groundwater contains fewer than 10,000 milligrams per liter (mg/L) total dissolved solids; and

(iii) it is not an exempted aquifer.

(B) This presumption may be rebutted upon a showing by the executive director or an affected person that water containing greater than or equal to 10,000 mg/L total dissolved solids can be put to a beneficial use.

(50) General permit--A permit issued under the provisions of this chapter authorizing the disposal of nonhazardous desalination concentrate and nonhazardous drinking water treatment residuals as provided by Texas Water Code, §27.023.

(51) Groundwater--Water below the land surface in a zone of saturation.

(52) Groundwater protection area--A geographic area (delineated by the state under federal Safe Drinking Water Act, 42 United States Code, §300j-13) near and/or surrounding community and non-transient, non-community water systems that use groundwater as a source of drinking water.

(53) Hazardous waste--Hazardous waste as defined in §335.1 of this title (relating to Definitions).

(54) Improved sinkhole--A naturally occurring karst depression or other natural crevice found in carbonate rocks, volcanic terrain, and other geologic settings which has been modified by man for the purpose of directing and emplacing fluids into the subsurface.

(55) Individual permit--A permit, as defined in the Texas Water Code (TWC), §27.011 and §27.021, issued by the commission or the executive director to a specific person or persons in accordance with the procedures prescribed in the TWC, Chapter 27 (other than TWC, §27.023).

(56) Injection interval--That part of the injection zone in which the well is authorized to be screened, perforated, or in which the waste is otherwise authorized to be directly emplaced.

(57) Injection operations--The subsurface emplacement of fluids occurring in connection with an injection well or wells, other than that occurring solely for construction or initial testing.

(58) Injection well--A well into which fluids are being injected. Components of an injection well annulus monitoring system are considered to be a part of the injection well.

(59) Injection zone--A formation, a group of formations, or part of a formation that receives fluid through a well.

(60) In service--The operational status when an authorized injection well is capable of injecting fluids, including times when the well is shut-in and on standby status.

(61) Intermediate casing--A string of casing with diameter intermediate between that of the surface casing and that of the smaller long-string or production casing, and which is set and cemented in a well after installation of the surface casing and prior to installation of the long-string or production casing.

(62) Large capacity cesspool--A cesspool that is designed for a flow of greater than 5,000 gallons per day.

(63) Large capacity septic system--A septic system that is designed for a flow of greater than 5,000 gallons per day.

(64) Licensed professional geoscientist--A geoscientist who maintains a current license through the Texas Board of Professional Geoscientists in accordance with its requirements for professional practice.

(65) Liner--An additional casing string typically set and cemented inside the long string casing and occasionally used to extend from base of the long string casing to or through the injection zone.

(66) Long string casing or production casing--A string of casing that is set inside the surface casing and that usually extends to or through the injection zone.

(67) Lost circulation zone--A term applicable to rotary drilling of wells to indicate a subsurface zone which is penetrated by a wellbore, and which is characterized by rock of high porosity and permeability, into which drilling fluids flow from the wellbore to the degree that the circulation of drilling fluids from the bit back to ground surface is disrupted or "lost."

(68) Mine area--The area defined by a line through the ring of designated monitor wells installed to monitor the production zone.

(69) Mine plan--A plan for operations at a mine, consisting of:

(A) a map of the permit area identifying the location and extent of existing and proposed production areas; and

(B) an estimated schedule indicating the sequence and timetable for mining and any required aquifer restoration.

(70) Monitor well--Any well used for the sampling or measurement with field instrumentation of any chemical or physical property of subsurface strata or their contained fluids. The term "monitor well" shall have the same meaning as the term "monitoring well" as defined in Texas Water Code, §27.002.

(A) Designated monitor wells are those listed in the production area authorization for which routine water quality sampling or measurement with field instrumentation is required.

(B) Secondary monitor wells are those wells in addition to designated monitor wells, used to delineate the horizontal and vertical extent of mining solutions.

(C) Pond monitor wells are wells used in the subsurface surveillance system near ponds or other pre-injection units.

(71) Motor vehicle waste disposal well--A well used for the disposal of fluids from vehicular repair or maintenance activities including, but not limited to, repair and maintenance facilities for cars, trucks, motorcycles, boats, railroad locomotives, and airplanes.

(72) Native groundwater--Groundwater naturally occurring in a geologic formation.

(73) New injection well--Any well, or group of wells, not an existing injection well.

(74) New waste stream--A waste stream not permitted.

(75) Non-commercial facility--A Class I permitted facility which operates only non-commercial wells.

(76) Non-commercial underground injection control (UIC) Class I well facility--A UIC Class I permitted facility where only non-commercial wells are operated.

(77) Non-commercial well--An underground injection control Class I injection well which disposes of wastes that are generated on-site, at a captured facility or from other facilities owned or effectively controlled by the same person.

(78) Notice of change (NOC)--A written submittal to the executive director from a permittee authorized under a general permit providing changes to information

previously provided to the agency, or any changes with respect to the nature or operations of the facility, or the characteristics of the waste to be injected.

(79) Notice of intent (NOI)--A written submittal to the executive director requesting coverage under the terms of a general permit.

(80) Off-site--Property which cannot be characterized as on-site.

(81) On-site--The same or geographically contiguous property which may be divided by public or private rights-of-way, provided the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing, as opposed to going along, the right-of-way. Noncontiguous properties owned by the same person but connected by a right-of-way which the owner controls and to which the public does not have access, is also considered on-site property.

(82) Out of service--The operational status when a well is not authorized to inject fluids, or the well itself is incapable of injecting fluids for mechanical reasons, maintenance operations, or well workovers or when injection is prohibited due to the well's inability to comply with the in-service operating standards of this chapter.

(83) Permit area--The area owned or under lease by the permittee which may include buffer areas, mine areas, and production areas.

(84) Plugging--The act or process of stopping the flow of water, oil, or gas into or out of a formation through a borehole or well penetrating that formation.

(85) Point of injection--For a Class V well, the last accessible sampling point prior to fluids being released into the subsurface environment.

(86) Pollution--The contamination of water or the alteration of the physical, chemical, or biological quality of water:

(A) that makes it harmful, detrimental, or injurious:

(i) to humans, animal life, vegetation, or property; or

(ii) to public health, safety, or welfare; or

(B) that impairs the usefulness or the public enjoyment of the water for any lawful and reasonable purpose.

(87) Pre-injection units--The on-site above-ground appurtenances, structures, equipment, and other fixtures including the injection pumps, filters, tanks, surface impoundments, and piping for wastewater transmission between any such facilities

and the well that are or will be used for storage or processing of waste to be injected, or in conjunction with an injection operation.

(88) Production area--The area defined by a line generally through the outer perimeter of injection and recovery wells used for mining.

(89) Production area authorization--An authorization, issued under the terms of a Class III injection well area permit, approving the initiation of mining activities in a specified production area within a permit area, and setting specific conditions for production and restoration in each production area within an area permit.

(90) Production well--A well used to recover uranium through in situ solution recovery, including an injection well used to recover uranium. The term does not include a well used to inject waste.

(91) Production zone--The stratigraphic interval extending vertically from the shallowest to the deepest stratum into which mining solutions are authorized to be introduced.

(92) Project operator--A person holding an authorization by rule, individual permit, or general permit to undertake an aquifer storage and recovery project.

(93) Public water system--A system for the provision to the public of water for human consumption through pipes or other constructed conveyances as defined in §290.38 of this title (relating to Definitions).

(94) Radioactive waste--Any waste which contains radioactive material in concentrations which exceed those listed in 10 Code of Federal Regulations Part 20, Appendix B, Table II, Column 2, and as amended.

(95) Registered Well--A well registered in accordance with the requirements of §331.221 of this title (relating to Registration of Wells).

(96) Restoration demonstration--A test or tests conducted by a permittee to simulate production and restoration conditions and verify or modify the fluid handling values submitted in the permit application.

(97) Restored aquifer--An aquifer whose local groundwater quality, within a production area, has, by natural or artificial processes, returned to the restoration table values established in accordance with the requirements of §331.107 of this title (relating to Restoration).

(98) Salt cavern--A hollowed-out void space that has been purposefully constructed within a salt formation, typically by means of solution mining by circulation of water from a well or wells connected to the surface.

(99) Salt cavern disposal well--For the purposes of this chapter, regulations of the commission, and not to underground injection control (UIC) Class II or UIC Class III wells in salt caverns regulated by the Texas Railroad Commission, a salt cavern disposal well is a type of UIC Class I injection well used:

(A) to solution mine a waste storage or disposal cavern in naturally occurring salt; and/or

(B) to inject nonhazardous, industrial, or municipal waste into a salt cavern for the purpose of storage or disposal of the waste.

(100) Salt dome--A geologic structure that includes the caprock, salt stock, and deformed strata surrounding the salt stock.

(101) Salt dome cavern confining zone--A zone between the salt dome cavern injection zone and all underground sources of drinking water and freshwater aquifers, that acts as a barrier to movement of waste out of a salt dome cavern injection zone, and consists of the entirety of the salt stock excluding any portion of the salt stock designated

as an underground injection control (UIC) Class I salt dome cavern injection zone or any portion of the salt stock occupied by a UIC Class II or Class III salt dome cavern or its disturbed salt zone.

(102) Salt dome cavern injection interval--That part of a salt dome cavern injection zone consisting of the void space of the salt dome cavern into which waste is stored or disposed of, or which is capable of receiving waste for storage or disposal.

(103) Salt dome cavern injection zone--The void space of a salt dome cavern that receives waste through a well, plus that portion of the salt stock enveloping the salt dome cavern, and extending from the boundaries of the cavern void outward a sufficient thickness to contain the disturbed salt zone, and an additional thickness of undisturbed salt sufficient to ensure that adequate separation exists between the outer limits of the injection zone and any other activities in the domal area.

(104) Salt stock--A geologic formation consisting of a relatively homogeneous mixture of evaporite minerals dominated by halite (NaCl) that has migrated from originally tabular beds into a vertical orientation.

(105) Sanitary waste--Liquid or solid waste originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing

operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned.

(106) Septic system--A well that is used to emplace sanitary waste below the surface, and is typically composed of a septic tank and subsurface fluid distribution system or disposal system.

(107) Stratum--A sedimentary bed or layer, regardless of thickness, that consists of generally the same kind of rock or material.

(108) Subsurface fluid distribution system--An assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground. This definition includes subsurface area drip dispersal systems as defined in §222.5 of this title (relating to Definitions).

(109) Surface casing--The first string of casing (after the conductor casing, if any) that is set in a well.

(110) Temporary injection point--A method of Class V injection that uses push point technology (injection probes pushed into the ground) for the one-time injection of fluids into or above an underground source of drinking water.

(111) Total dissolved solids--The total dissolved (filterable) solids as determined by use of the method specified in 40 Code of Federal Regulations Part 136, as amended.

(112) Transmissive fault or fracture--A fault or fracture that has sufficient permeability and vertical extent to allow fluids to move between formations.

(113) Underground injection--The subsurface emplacement of fluids through a well.

(114) Underground injection control--The program under the federal Safe Drinking Water Act, 42 United States Code, Part C, including the approved Texas state program.

(115) Underground source of drinking water--An "aquifer" or its portions:

(A) which supplies drinking water for human consumption; or

(B) in which the groundwater contains fewer than 10,000 milligrams per liter total dissolved solids; and

(C) which is not an exempted aquifer.

(116) Upper limit--A parameter value established by the commission in a permit/production area authorization which when exceeded indicates mining solutions may be present in designated monitor wells.

(117) Verifying analysis--A second sampling and analysis or measurement with instrumentation of control parameters for the purpose of confirming a routine sample analysis or measurement which indicated an increase in any control parameter to a level exceeding the upper limit. Mining solutions are assumed to be present in a designated monitor well if a verifying analysis confirms that any control parameter in a designated monitor well is present in concentration equal to or greater than the upper limit value.

(118) Well--A bored, drilled, or driven shaft whose depth is greater than the largest surface dimension, a dug hole whose depth is greater than the largest surface dimension, an improved sinkhole, or a subsurface fluid distribution system but does not include any surface pit, surface excavation, or natural depression.

(119) Well injection--The subsurface emplacement of fluids through a well.

(120) Well monitoring--The measurement by on-site instruments or laboratory methods of any chemical, physical, radiological, or biological property of the subsurface strata or their contained fluids penetrated by the wellbore.

(121) Well stimulation--Several processes used to clean the well bore, enlarge channels, and increase pore space in the injection interval, thus making it possible for fluid to move more readily into the formation including, but not limited to, surging, jetting, and acidizing.

(122) Workover--An operation in which a down-hole component of a well is repaired, the engineering design of the well is changed, or the mechanical integrity of the well is compromised. Workovers include operations such as sidetracking, the addition of perforations within the permitted injection interval, and the addition of liners or patches. For the purposes of this chapter, workovers do not include well stimulation operations.

§331.7. Permit Required.

(a) Except as provided in §331.9 of this title (relating to Injection Authorized by Rule) and by subsections (d) - (f) of this section, all injection wells and activities must be authorized by an individual permit.

(b) For Class III in situ uranium solution mining wells, Frasch sulfur wells, and other Class III operations under commission jurisdiction, an area permit authorizing more than one well may be issued for a defined permit area in which wells of similar design and operation are proposed. The wells must be operated by a single owner or operator. Before

commencing operation of those wells, the permittee may be required to obtain a production area authorization for separate production or mining areas within the permit area.

(c) The owner or operator of a large capacity septic system, a septic system which accepts industrial waste, or a subsurface area drip dispersal system, as defined in §222.5 of this title (relating to Definitions) must obtain a wastewater discharge permit in accordance with Texas Water Code, Chapter 26 or Chapters 26 and 32, and Chapter 305 of this title (relating to Consolidated Permits), and must submit the inventory information required under §331.10 of this title (relating to Inventory of Wells Authorized by Rule).

(d) Pre-injection units for Class I nonhazardous, noncommercial injection wells and Class V injection wells permitted for the disposal of nonhazardous waste must be either authorized by a permit issued by the commission or registered in accordance with §331.17 of this title (relating to Pre-Injection Units Registration). The option of registration provided by this subsection shall not apply to pre-injection units for Class I injection wells used for the disposal of byproduct material, as that term is defined in Chapter 336 of this title (relating to Radioactive Substance Rules). Pre-injection units for Class I wells authorized to inject only nonhazardous desalination concentrate or nonhazardous drinking water treatment residuals are not subject to authorization by registration but are subject to authorization by an individual permit or under the general permit issued under Subchapter L of this chapter (relating to General Permit Authorizing Use of a Class I Injection Well to

Inject Nonhazardous Desalination Concentrate or Nonhazardous Drinking Water Treatment Residuals).

(e) The commission may issue a general permit under Subchapter L of this chapter. The commission may determine that an injection well and the injection activities are more appropriately regulated under an individual permit than under a general permit based on findings that the general permit will not protect ground and surface fresh water from pollution due to site-specific conditions.

(f) Notwithstanding subsection (a) of this section, an injection well authorized by the Railroad Commission of Texas to use nonhazardous desalination concentrate or nonhazardous drinking water treatment residuals as an injection fluid for enhanced recovery purposes does not require a permit from the commission. The use or disposal of radioactive material under this subsection is subject to the applicable requirements of Chapter 336 of this title.

(g) Permits issued before September 1, 2007 for Class III wells for uranium mining will expire on September 1, 2012 unless the permit holder submits an application for permit renewal under §305.65 of this title (relating to Renewal) before September 1, 2012. Any holders of permits for Class III wells for uranium mining issued before September 1, 2007 who allow those permits to expire by not submitting a permit renewal application by September 1, 2012 are not relieved from the obligations under the expired permit or

applicable rules, including obligations to restore groundwater and to plug and abandon wells in accordance with the requirements of the permit and applicable rules.

(h) Class V injection wells associated with an aquifer storage and recovery (ASR) project may be authorized by individual permit, general permit, or by rule. The executive director will notify a groundwater conservation district of an ASR project proposed to be authorized by rule that is located within the jurisdictional boundary of that groundwater conservation district.

§331.11. Classification of Injection Wells.

(a) Injection wells within the jurisdiction of the commission are classified as follows.

(1) Class I:

(A) wells used by generators of hazardous wastes or owners or operators of hazardous waste management facilities to inject hazardous waste, other than Class IV wells;

(B) other industrial and municipal waste disposal wells which inject fluids beneath the lower-most formation which within 1/4 mile of the wellbore contains an underground source of drinking water (USDW); and

(C) radioactive waste disposal wells which inject fluids below the lower-most formation containing a USDW within 1/4 mile of the wellbore.

(2) Class III. Wells which are used for the extraction of minerals, including:

(A) mining of sulfur by the Frasch process; and

(B) solution mining of minerals which includes sodium sulfate, sulfur, potash, phosphate, copper, uranium and any other minerals which can be mined by this process.

(3) Class IV. Wells used by generators of hazardous wastes or of radioactive wastes, by owners or operators of hazardous waste management facilities, or by owners or operators of radioactive waste disposal sites to dispose of hazardous wastes or radioactive wastes into or above a formation which within 1/4 mile of the wellbore contains a USDW.

(4) Class V. Class V wells are injection wells not included in Classes I, II, III, or IV. Generally, wells covered by this paragraph inject nonhazardous fluids into or above formations that contain USDWs. Except for Class V wells within the jurisdiction of the Railroad Commission of Texas, all Class V injection wells are within the jurisdiction of the commission and include, but are not limited to:

(A) air conditioning return flow wells used to return to the supply aquifer the water used for heating or cooling in a heat pump;

(B) closed loop injection wells which are closed system geothermal wells used to circulate fluids including water, water with additives, or other fluids or gases through the earth as a heat source or heat sink;

(C) large capacity cesspools or other devices that receive greater than 5,000 gallons of waste per day, which have an open bottom and sometimes have perforated sides;

(D) cooling water return flow wells used to inject water previously used for cooling;

(E) drainage wells used to drain surface fluid, primarily storm runoff, into a subsurface formation;

(F) drywells used for the injection of wastes into a subsurface formation;

(G) recharge wells used to replenish the water in an aquifer;

(H) salt water intrusion barrier wells used to inject water into a freshwater aquifer to prevent the intrusion of salt water into the fresh water;

(I) sand backfill wells used to inject a mixture of water and sand, mill tailings, or other solids into mined out portions of subsurface mines;

(J) septic systems designed to inject greater than 5,000 gallons per day of waste or effluent;

(K) subsidence control wells (not used for the purpose of oil or natural gas production) used to inject fluids into a non-oil or gas producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water;

(L) wells used for the injection of water for storage and subsequent retrieval for beneficial use as part of an aquifer storage and recovery project;

(M) motor vehicle waste disposal wells which are used or have been used for the disposal of fluids from vehicular repair or maintenance activities, such as an automotive repair shop, auto body shop, car dealership, boat, motorcycle or airplane dealership, or repair facility;

(N) improved sinkholes;

(O) aquifer remediation wells, temporary injection points, and subsurface fluid distribution systems used to inject nonhazardous fluids into the subsurface to aid in the remediation of soil and groundwater; and

(P) subsurface fluid distribution systems.

(b) Class II wells and Class III wells used for brine mining fall within the jurisdiction of the Railroad Commission of Texas.

(c) Baseline wells and monitor wells associated with Class III injection wells within the jurisdiction of the commission are also subject to the rules specified in this chapter.

(d) The commission has jurisdiction over the injection of carbon dioxide produced by a clean coal project into a zone that is below the base of usable quality water and that is not productive of oil, gas, or geothermal resources.

**SUBCHAPTER K: ADDITIONAL REQUIREMENTS FOR CLASS V INJECTION
WELLS ASSOCIATED WITH AQUIFER STORAGE AND RECOVERY
PROJECTS**

§§331.181 - 331.186

Statutory Authority

The amendments are adopted under Texas Water Code (TWC), §5.103, which provides the commission the authority to adopt any rules necessary to carry out its powers and duties under TWC and other laws of this state; TWC, §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; TWC, §5.120, which authorizes the commission to administer the law so as to promote the judicious use and maximum conservation and protection of the environment and natural resources of the state; TWC, §27.019, which requires the commission to adopt rules reasonably required for the regulation of injection wells; TWC, §27.153, which requires the commission to adopt rules for authorization of aquifer storage and recovery injection wells by rule or by permit; and TWC, §27.154, which requires the commission to adopt technical standards for aquifer storage and recovery injection wells.

The adopted amendments implement House Bill 655, 84th Texas Legislature, 2015, and TWC, Chapter 27, Subchapter G, which confers commission jurisdiction and establishes requirements for injection wells associated with aquifer storage and recovery projects.

§331.181. Applicability.

In addition to the requirements of Subchapter H of this chapter (relating to Standards for Class V Wells), the requirements of this subchapter apply to all Class V aquifer storage and recovery injection wells.

§331.182. Area of Review.

The area of review for an aquifer storage and recovery (ASR) project is the area determined by a radius of 1/2 mile from the proposed ASR injection well. For an ASR project that includes more than one proposed injection well, the area of review is the area determined by a radius of 1/2 mile from the centroid of the injection well field. If the extent of the underground stored water of the ASR project will exceed the area determined by the 1/2 mile radius as described in this section, the area of review is the area determined by the projected extent of the underground stored water as calculated by using site-specific hydrogeologic information. In the application for authorization, the applicant shall provide information on the activities within the area of review including the following factors and their adverse impacts, if any, on the injection operation:

(1) location of all artificial penetrations that penetrate the interval to be used for aquifer storage and recovery, including but not limited to: water wells and abandoned water wells from commission well files or ground water district files; oil and gas wells and

saltwater injection wells from the Railroad Commission of Texas files; and waste disposal wells/other injection wells from the commission disposal well files;

(2) completion and construction information, where available, for identified artificial penetrations;

(3) site specific, significant geologic features, such as faults and fractures; and

(4) all information required for the consideration of an aquifer storage and recovery injection well under §331.186(a) of this title (relating to Additional Requirements).

§331.183. Construction and Closure Standards.

All Class V aquifer storage and recovery (ASR) injection wells shall be designed, constructed, completed, and closed to prevent commingling, through the wellbore and casing, of injection waters with other fluids outside of the authorized injection zone; mixing through the wellbore and casing of fluids from aquifers of substantively different water quality; and infiltration through the wellbore and casing of water from the surface into ground water zones.

(1) Plans and specifications. Except as specifically required in the terms of the Class V injection well authorization, the drilling and completion of a Class V ASR injection well shall be done in accordance with the requirements of §331.132 of this title (relating to Construction Standards) and the closure of a Class V ASR injection well shall be done in accordance with the requirements of §331.133 of this title (relating to Closure Standards for Injection Wells).

(A) If the project operator proposes to change the injection interval to one not reviewed during the authorization process, the project operator shall notify the executive director immediately. The project operator may not inject into any unauthorized zone.

(B) The executive director shall be notified immediately of any other changes, including but not limited to, changes in the completion of the well, changes in the setting of screens, and changes in the injection intervals within the authorized injection zone.

(2) Construction materials. Casing materials for Class V ASR injection wells shall be constructed of materials resistant to corrosion.

(3) Construction and workover supervision. All phases of any ASR injection well construction, workover or closure shall be supervised by qualified individuals who are

knowledgeable and experienced in practical drilling engineering and who are familiar with the special conditions and requirements of injection well and water well construction.

(4) An ASR production well, or an ASR injection well that is also serving as an ASR production well, and is providing water to a public water system must comply with the applicable requirements for groundwater sources in §290.41 of this title (relating to Water Sources).

(5) All ASR injection wells and all ASR production wells associated with a single ASR project must be located:

(A) within a continuous perimeter boundary of one parcel of land; or

(B) within two or more adjacent parcels of land under the common ownership, lease, joint operating agreement, or contract.

§331.184. Operating Requirements.

(a) All Class V aquifer storage and recovery (ASR) injection wells shall be operated in such a manner that injection will not endanger drinking water sources. Underground injection endangers drinking water sources if such injection may result in the presence in underground water which supplies or can reasonably be expected to supply any public

water system of any contaminant, and if the presence of such contaminant may result in such system's not complying with any national primary drinking water regulation or may otherwise adversely affect the health of persons .

(b) Injection pressure at the wellhead shall not exceed a maximum which shall be calculated so as to assure the pressure in the injection zone does not cause movement of fluid out of the injection zone.

(c) The owner or operator of an ASR injection well that has ceased operations for more than two years shall notify the executive director 30 days prior to resuming operation of the well.

(d) The owner or operator shall maintain the mechanical integrity of all wells operated under this section.

(e) The quality of the water injected at an ASR project must meet the requirements in §331.186(a)(1) of this title (relating to Additional Requirements). Water recovered from an ASR project that is provided to a public water system is subject to all applicable requirements, maximum contaminant levels, and treatment techniques under Chapter 290 of this title (relating to Public Drinking Water).

(f) All ASR injection and ASR production wells must be installed with a flow meter for measuring the volume of water injected and the volume of the water recovered.

(g) This subsection only applies to an ASR project that is located within the jurisdiction of a groundwater conservation district or other special-purpose district with the authority to regulate the withdrawal of groundwater.

(1) An authorization or permit issued under this chapter may not authorize a volume of water to be recovered that exceeds the volume of water that is injected or the volume of injected water that the commission determines can be recovered, whichever is less; and

(2) The requirements of Texas Water Code, Chapter 36, Subchapter N apply to the volume of water recovered from an ASR project that exceeds the volume of water the commission determines can be recovered, and otherwise as applicable.

§331.185. Monitoring and Reporting Requirements.

(a) An aquifer storage and recovery (ASR) project operator shall monitor each ASR injection well and each ASR production well associated with an ASR project. Each calendar month the project operator shall provide the executive director either a written or electronic report of the following information for the previous month:

(1) the volume of water injected for storage;

(2) the volume of water recovered for beneficial use;

(3) monthly average injection pressures; and

(4) other information as determined by the executive director as necessary for the protection of underground sources of drinking water.

(b) On an annual basis, an ASR project operator shall perform water quality testing on water to be injected at an ASR project and on water that is recovered from that project. The ASR project operator shall provide the executive director either a written or electronic report of the results of this testing. The report shall include the test results for all water quality parameters identified in the individual permit, general permit, or authorization by rule.

§331.186. Additional Requirements.

(a) The executive director or commission shall consider the following before issuing an individual permit, a general permit, or an authorization by rule for an aquifer storage and recovery (ASR) injection well:

(1) whether the injection of water will comply with the standards set forth under the federal Safe Drinking Water Act (42 United States Code, §§300f, *et seq*);

(2) the extent to which the cumulative volume of water injected for storage in the receiving geologic formation can be successfully recovered from the geologic formation for beneficial use, taking into account that the injected water may be comingled to some degree with native groundwater;

(3) the effect of the ASR project on existing water wells; and

(4) whether the introduction of water into the receiving geologic formation will alter the physical, chemical, or biological quality of the native groundwater to a degree that would:

(A) render the groundwater produced from the receiving formation harmful or detrimental to people, animals, vegetation, or property; or

(B) require an unreasonably higher level of treatment of the groundwater produced from the receiving geologic formation than is necessary for the native groundwater in order to render the groundwater suitable for beneficial use.

(b) Upon completion of an ASR injection well, the following information shall be submitted to the executive director within 30 days of receipt of the results of all analyses and test results:

(1) as-built drilling and completion data on the well;

(2) all logging and testing data on the well;

(3) formation fluid analyses;

(4) injection fluid analyses;

(5) injectivity and pumping tests determining well capacity and reservoir characteristics;

(6) hydrogeologic modeling, with supporting data, predicting mixing zone characteristics and injection fluid movement and quality; and

(7) other information as determined by the executive director as necessary for the protection of underground sources of drinking water.