

The Texas Commission on Environmental Quality (commission) adopts amendments to §§331.2, 331.5, 331.7, 331.47, 331.121, and 331.163. The commission also adopts new §331.17 and §331.18.

Sections 331.2, 331.5, 331.7, 331.17, 331.18, and 331.163 are adopted *with changes* to the proposed text as published in the July 12, 2002 issue of the *Texas Register* (27 TexReg 6227). Sections 331.47, and 331.121 are adopted *without changes* to the proposed text and will not be republished.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE ADOPTED RULES

The commission's practice of permitting pre-injection units and other surface units as part of nonhazardous noncommercial underground injection control (UIC) permits has varied over time, due to the different scope of applications submitted by applicants, and due to different interpretations of statutes and the provisions of Chapter 331. Generally, it has been the applicants' option whether to include pre-injection facility information in their UIC permit applications. About half of the UIC permits issued by the commission for on-site disposal of nonhazardous waste include specifications for pre-injection units. This rulemaking provides the option of including pre-injection units in a registration under the authority of Texas Water Code (TWC), Chapter 27, and provides a consistent set of standards and guidance to permit applicants, agency staff, and the general public on application requirements for pre-injection units, whether they are to be authorized by permit or registration. This rulemaking changes the terms "Pre-injection facilities" and "Surface facilities," which are considered to be terms of art, to "Pre-injection units." These changes are adopted for consistency with other agency definitions wherein "facility" usually refers to a property along with structures and other appurtenances, and "unit" usually refers to the individual types of equipment used for the management of waste, such as tanks, pumps, and surface impoundments.

The commission gave preliminary consideration to this issue at a commissioners' work session on October 20, 2000 and directed staff to conduct additional research on the issue and develop recommendations. Staff returned to work session on January 17, 2001, and presented a list of options relating to the regulation of pre-injection units associated with on-site nonhazardous waste disposal by Class I injection wells and any permitted Class V injection wells. The commission directed staff to require applicants for UIC permits to include design information for pre-injection units with the permit application, and to review the design information to ensure it is adequate to protect groundwater. Applicants were to be informed that inclusion of nonhazardous pre-injection units as part of their UIC permits was optional. Applicants who choose not to include nonhazardous pre-injection units in their UIC permits would be subject to a registration process for those units. Applicants also were to be informed that sufficient design information must be included in permit or registration applications so that staff could conduct a technical review and determine whether the pre-injection units are protective of human health and the environment.

TWC, Chapter 27 provides authority to the commission to regulate injection wells and to prevent underground injection which may pollute fresh water. Commission UIC rules prior to this adoption required permits for "all injection wells and activities." Those rules defined the term "Activity" to include "the construction or operation of an injection well or pre-injection facilities." The term "Pre-injection facilities" was also defined to include the "on-site above-ground appurtenances, structures, equipment, and other fixtures that are or will be used for storage, processing, or in conjunction with an injection operation." These definitions had provided the basis for inclusion of pre-injection facilities in UIC permits in the past. The commission adopts an amendment to the definition of "Activity" in

§331.2, Definitions. This amendment particularizes the meaning of the term “activity” and effectively separates and distinguishes the regulation of the injection well itself from the regulation of pre-injection units. Thus, if the applicant chooses to register nonhazardous, noncommercial pre-injection units, the injection well permit will regulate only the injection operation “from the wellhead down” and the well annulus monitoring system.

On-site processing, storage, and disposal of industrial nonhazardous solid waste are exempt from solid waste permitting under Texas Health and Safety Code (THSC), §361.090. Also, the United States Environmental Protection Agency (EPA) does not currently require states to regulate pre-injection units for nonhazardous noncommercial injection wells under either the Resource Conservation and Recovery Act (RCRA) or UIC regulations. However, THSC, §361.090(d) provides that the commission may adopt rules to control the collection, handling, storage, processing, and disposal of industrial solid waste to protect the property of others, public property and rights-of-way, groundwater, and other rights requiring protection. This adoption provides rules to control the collection, handling, storage, and processing of industrial nonhazardous solid waste prior to its disposal in accordance with an underground injection control permit authorized by TWC, Chapter 27.

A conforming amendment to 30 TAC §39.403 is adopted and is also published in this issue of the *Texas Register*.

SECTION BY SECTION DISCUSSION

The commission adopts amended §331.2(2), Definitions, to clarify the definition of “Activity” by changing the definition from “The construction or operation of an injection well or of pre-injection facilities, including the processing, storage, and disposal of waste” to the following: “The construction or operation of an injection well for disposal of waste, or of pre-injection units for processing or storage of waste.” The primary effect of this revision is to change the word “facilities” to “units” and to make the distinction that injection wells are used for disposal of waste, while the pre-injection units are used for processing and storage.

The commission adopts amended §331.2(44) to delete the phrase “surface storage or” from the definition of “Injection operations,” to reflect that surface storage units are not considered to be part of the injection operations. The commission intends that this change will help clarify that surface storage units are considered to be pre-injection units and not part of the injection well itself.

The commission adopts amended §331.2(45) to add the following sentence to the definition of “Injection well,” in order to more fully define this term: “Components of an injection well annulus monitoring system are considered to be a part of the injection well.”

The commission adopts amended §331.2(56)(C), to revise the meaning of “Pond monitor wells” by changing the phrase “surface facility” to “pre-injection units.”

The commission adopts amended §331.2(70), to revise the definition of “Pre-injection facilities,” to further delineate and specify the types of above ground appurtenances, structures, equipment, and other fixtures associated with pre-injection operations. Specifically, the word “facilities” is changed to “units,” and “Pre-injection units” is defined to include “injection pumps, filters, tanks, surface impoundments, and piping for wastewater transmission between any such facilities and the well.” The adoption also includes the addition of the phrase “of waste to be injected.” These revisions are adopted to further reinforce the differences between the pre-injection units and the injection well. This greater degree of specificity is also necessary to distinguish between the injection well and those nonhazardous pre-injection units which may be authorized by registration.

Section 331.5, Prevention of Pollution, is amended to add prohibitions relating to pre-injection units which are required to be authorized under §331.7(d). The adopted language requires that these units be designed, constructed, operated, maintained, monitored, and closed so as not to cause: 1) the discharge or imminent threat of discharge of waste into or adjacent to the waters in the state without obtaining specific authorization for such a discharge from the commission; 2) the creation or maintenance of a nuisance; or 3) the endangerment of the public health and welfare. In a change from proposal, the commission has changed the phrase “the creation and maintenance of a nuisance” to “the creation or maintenance of a nuisance,” in order to reflect the commission’s intent that this phrase be disjunctive rather than conjunctive.

The commission adopts amended §331.7, Permit Required, to improve the procedures for technical review of pre-injection units for nonhazardous, noncommercial injection wells. Section 331.7(a) is

amended to provide that, except as provided in subsection (d), all activities are required to be permitted. This amendment will authorize certain activities, as that term is defined in §331.2(2), associated with nonhazardous, noncommercial pre-injection units to be registered as an option to permitting. The phrase “and activities” was proposed to be deleted from this subparagraph. However, deleting this phrase would arguably exempt hazardous waste pre-injection units from any UIC permit requirement, and would also exempt the construction and operation of an injection well from the UIC permit requirement, which was clearly not the intent of the proposed rulemaking. Therefore, the commission adopts revisions to the proposal, under §331.7(a), by retaining the phrase “and activities” and adding the phrase “and by subsection (d) of this section” to the exceptions phrase of §331.7(a). This achieves the same intended result as the §331.7(a) proposal language by making §331.7(a) and §331.7(d) harmonious, while at the same time reducing the possibility of confusion about the meaning of the permit requirement in §331.7(a).

Adopted §331.7(d) is a new subsection that specifies that pre-injection units must either be authorized by a permit issued by the commission or registered in accordance with adopted new §331.17. The commission notes that it is the applicants’ option whether to include nonhazardous, noncommercial pre-injection units in their UIC permits or to register those units under the authority of TWC, Chapter 27. An applicant may also elect to include nonhazardous, noncommercial pre-injection units in a wastewater permit, if desired by the applicant and if determined by the commission to be appropriate. Additionally, adopted §331.7(d) clarifies that the option of registering does not apply to pre-injection units associated with Class I injection wells that dispose of byproduct material, as that term is defined in THSC, §401.003 and in commission rules in 30 TAC §336.2, concerning definitions. Byproduct

material is excluded from the definition of solid waste in 40 Code of Federal Regulations §261.4(a)(4) and 30 TAC §335.1 under the definition of “solid waste.” All surface impoundments and other pre-injection units associated with byproduct waste disposal wells must continue to be authorized by permit.

Adopted new §331.17, Pre-Injection Units Registration, outlines the procedures for submitting an application for registration of UIC pre-injection units. Registration of pre-injection units and submittal of plans, specifications, and details of those units will enable agency staff to conduct a technical review of the pre-injection units associated with an on-site nonhazardous waste injection well to determine if the design of these units meets the requirements of TWC, Chapter 27; THSC, §361.090; and the technical standards specified in 30 TAC Chapter 317. At a minimum, this review will include checking the application for proper engineering seals as required by the Engineering Practice Act, reviewing the application to determine if the nonhazardous waste management units will be protective of human health and the environment, and determining if there is sufficient information to draft appropriate UIC registration or permit provisions. Section 331.17(a) provides that nonhazardous, noncommercial pre-injection units which are not authorized by permit, must be registered in accordance with the applicable requirements of this chapter. Section 331.17(b) provides that no registration shall be allowed where a pre-injection unit causes or allows the release of fluid that would result in the pollution of underground sources of drinking water, fresh water, or surface water. Section 331.17(c) sets forth registration procedures for owners or operators of nonhazardous, noncommercial pre-injection units not otherwise authorized under this chapter. The adopted rule requires the owner or operator to submit an application for registration to the executive director, in accordance with the applicable requirements of this subchapter, and for any new pre-injection unit, obtain approval of the registration before operating the

pre-injection unit. In a minor change from proposal, under adopted §331.17(c)(1)(A), the phrase “approval from the executive director” is changed to “approval of the registration,” and the word “and” is changed to “or.” In a change from proposal, the applicability of adopted §331.17(c)(1)(B) is limited to existing unauthorized pre-injection units by the addition of the word “unauthorized,” to more accurately reflect the intent of the commission’s proposal. For any existing pre-injection unit, the owner or operator will be required to submit the application on or before the date the injection well permit renewal application is submitted. Section 331.17(c) also contains the requirement for the owner or operator to cease operation of a pre-injection unit under certain conditions. Under adopted §331.17(c)(2)(A), in order to make the meaning of the word “renewed” clear, the proposed phrase “before the injection well permit is renewed” has been revised to read “before approval of the injection well permit renewal.” In a minor change from proposal, under adopted §331.17(c)(2)(C), the term “provided that” is replaced with “however.” In another minor change from proposal, under adopted §331.17(c)(2)(E), the phrase “the executive director determines that” is added just prior to the phrase “the unit poses an immediate threat to public health or safety.” This adopted revision makes subparagraph (E) consistent with the rule language under adopted §331.17(b)(2). Section 331.17(d) specifies the minimum design criteria for UIC pre-injection units. Proposed new §331.17(e), which would have required corrective action for pre-injection units, not otherwise authorized by permit, to be performed under §331.44 concerning corrective action standards, is not being adopted, for reasons explained in the RESPONSE TO COMMENTS section of this preamble. In addition, minor administrative changes have been made to conform with agency and *Texas Register* requirements.

Adopted new §331.18, Registration Application Processing, Notice, Comment, Motion to Overturn, outlines the procedures for processing an application for registration of UIC pre-injection units. Registrations for pre-injection units are subject to public notice. The adopted rules provide that the chief clerk of the commission shall mail notice of the registration to landowners named on the application map. There will be a 30-day comment period during which interested persons may file written comments on the proposed registration. The executive director will consider the written comments before deciding whether to issue the registration. The rules further provide an opportunity to file a motion to overturn the executive director's decision to issue or deny a registration; however, persons filing written comments or a motion to overturn are not entitled to a public meeting or a contested case hearing on a UIC pre-injection unit registration. Affected persons may request a contested case hearing on the related UIC permit application in accordance with the procedural rules in 30 TAC Chapter 55. Section 331.18(a) sets forth the purpose and scope of this section. Section 331.18(b) specifies the necessary components of a registration application and provides the mailed notice requirements for registration of UIC pre-injection units. In a change from proposal, the commission adopts a change under §331.18(b)(4) to replace the word "whenever" with the phrase "no later than 30 days after," in order to set forth a more reasonable and specific deadline for the required information to be confirmed or updated. Under adopted §331.18(b)(5), the commission notes that the required registration application maps do not require identification of any mineral rights owners. Section 331.18(c) provides for administrative processing and completeness of a registration application. In a change from proposal, the commission deletes the language concerning the internal 14-day deadline for administrative completeness review and replaces it with language referencing the commission rule that states this deadline, §281.3(a). Section 331.18(d) provides for notice of the receipt and declaration

of technical completeness of the registration application. Adopted §331.18(d)(4) contains minor changes in the rule language concerning identification of the applicant and agency contact, in order to make the wording more consistent with existing notice requirements under §39.411(b). Section 331.18(e) includes requirements for public notice of the registration. Section 331.18(f) includes application processing procedures and requirements. Section 331.18(g) addresses major amendments of registrations. Major amendments include substantive changes to engineering plans and specifications. Section 331.18(h) addresses minor amendments of registrations. Routine maintenance and replacement of existing units with equivalent units do not require amendment of the registration. Section 331.18(i) provides a 30-day public comment period on registrations. In a change from proposal, §331.18(i) is adopted to also apply to renewal applications to register pre-injection units, to be consistent with adopted §331.18(e). Section 331.18(j) provides the executive director delegation for authority to approve pre-injection unit registrations. Section 331.18(k) provides that registrations are subject to a motion to overturn process on the executive director's final approval of an application.

Additional requirements pertaining to pre-injection units are adopted in §331.47, Pond Lining. This section is divided into two subsections. Subsection (a) is amended to: add an exception phrase for subsection (b); change the term "surface facilities" to "pre-injection units"; and insert the word "surface" before "impoundment" for consistency with the definition of "surface impoundment" under §335.1. Also, the word "and" is changed to "or" to explain the distinction that technical requirements may be approved by the executive director or may be specified in the permit. Subsection (b) applies to noncommercial injection wells which dispose of nonhazardous Class 1 industrial waste and provides

that all surface impoundments associated with these wells must conform to any applicable requirements of Chapter 317.

Adopted §331.121(a)(2)(K) is amended to add engineering drawings for pre-injection units to the information to be included in the technical report for a Class I injection well permit application.

Adopted §331.121(a)(2)(Q) is added to require that the technical report include the authorization status of the pre-injection units. Section 331.121(a)(2)(R) is added to require that the technical report include information demonstrating compliance with the applicable design criteria of Chapter 317, for pre-injection units associated with Class I nonhazardous, noncommercial injection wells.

The well construction standards for Class I salt cavern solid waste disposal wells given in adopted §331.163, Well Construction Standards, are amended. Specifically, the term “Surface facilities” found in §331.163(g) and (g)(3) is changed to “Pre-injection units” for consistency with the adopted definition of “Pre-injection unit” in §331.2(70). In addition, minor administrative changes have been made to conform with agency and *Texas Register* requirements. Finally, adopted §331.163(i)(1) contains a cross-reference correction, with the reference to §331.45(1) being changed to §331.45(2).

FINAL REGULATORY IMPACT ANALYSIS DETERMINATION

The commission has reviewed the adopted rules in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and has determined that the adopted rules are not subject to §2001.0225 because they do not meet the definition of a “major environmental rule” as defined in that 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, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The specific intent of the rules is to protect the environment and reduce risks to human health. The adopted rules clarify commission rules for pre-injection units at Class I noncommercial, nonhazardous injection wells so that pre-injection units will be regulated in a more consistent manner. The rules substantially advance their purpose by clarifying the definitions of injection well and pre-injection units; adding registration as an alternative to including pre-injection units in the injection well permit; and explicitly stating the design standards that will apply to all covered pre-injection units. In addition, the requirement to include pre-injection units in a permit or registration is synchronized with renewal of the injection well permit. However, because the adopted rules do not require more from an applicant than is required by application of current rules, the adopted rules do not adversely affect in a material way the economy, a sector of the economy, productivity, competition, or jobs. The adopted rules are not anticipated to adversely affect in a material way the environment or the public health and safety of the state or a sector of the state because the adopted technical standards provide protection for health and the environment that is substantially similar to the protection provided by application of the previous rules.

In addition, the adopted rules do not exceed the four applicability requirements of Texas Government Code, §2001.0025(a)(1) - (4) in that the adopted rules do not: 1) exceed a standard set by federal law; 2) exceed an express requirement of state law; 3) exceed a requirement of a delegation agreement; or 4) propose to adopt a rule solely under the general powers of the agency.

The adopted rules do not exceed a standard set by federal law because there are no such corresponding federal standards for pre-injection units at Class I noncommercial, nonhazardous injection wells.

Further, the adopted rules do not exceed an express requirement of state law because TWC, Chapter 27 does not establish express requirements for pre-injection units at Class I noncommercial, nonhazardous injection wells. The adopted rules do not exceed the requirements of the delegation agreement because the delegation agreement does not establish express requirements for pre-injection units. These adopted rules are not adopted solely under the general powers of the agency, but are adopted under the specific provisions of the Texas Injection Well Act, TWC, §§27.002, 27.003, 27.011, 27.019(a), and 27.051(3).

TAKINGS IMPACT ASSESSMENT

The commission has prepared a takings impact assessment for these adopted rules in accordance with Texas Government Code, §2007.043. The commission's assessment indicates that the Texas Government Code, Chapter 2007 does not apply to these rules because the rules are an action that is taken in response to a real and substantial threat to public health and safety, they are designed to significantly advance the health and safety purpose, and they do not impose a greater burden than is necessary to achieve the health and safety purpose. Texas Government Code, §2007.003(b)(13), provides that an action that is taken in response to a real and substantial threat to public health and safety; that is designed to significantly advance the health and safety purpose, and that does not impose a greater burden than is necessary to achieve the health and safety purpose is exempt from Chapter 2007.

The real and substantial threat to public health and safety in this rulemaking involves activities that may pollute fresh water. The Texas Injection Well Act, TWC, §27.003 states that it is the policy of the state to “prevent underground injection that may pollute fresh water” and “to require the use of all reasonable methods to implement this policy.” Section 27.051(3) requires that the commission make a finding, before it issues a permit, “that, with proper safeguards both ground and surface fresh water can be adequately protected from pollution.” Section 27.002(4) defines “pollution” as “the alteration of the physical, chemical, or biological quality of or the contamination of, water that makes it harmful, detrimental, or injurious to humans....”

The adopted rules would reduce this threat by requiring that Class I noncommercial, nonhazardous pre-injection units meet the design criteria for sewerage systems, while offering to applicants the option of using a registration process to authorize such pre-injection units.

The adopted rules significantly advance the health and safety purpose by setting a uniform design standard which is protective of human health and safety for certain pre-injection units. The design standards protect health and safety by requiring the management of waste fluids in such a manner as to prevent their excursion into fresh waters in the state.

The adopted rules do not impose a greater burden than is necessary to achieve the health and safety purpose because the design standards for Class I noncommercial, nonhazardous pre-injection units represent the engineering practice necessary to prevent the pollution of fresh water. Further, the rules allow applicants to use a registration process. The option of using a registration process is expected to

provide, in some instances, a less burdensome method of administering the design standards than the current rules, which require that Class I noncommercial, nonhazardous pre-injection units be included in the injection well permit.

The adopted rules are not subject to Texas Government Code, Chapter 2007 because they are exempt under the provisions of §2007.003(b)(13).

Nevertheless, the commission further evaluated these adopted rules and performed an assessment of whether these adopted rules constitute a taking under Texas Government Code, Chapter 2007. The specific purpose of these rules is to clarify commission rules for pre-injection units at Class I noncommercial, nonhazardous injection wells so that pre-injection units will be regulated in a more consistent manner. The adopted rules substantially advance this purpose by clarifying the definitions of injection well and pre-injection units, adding registration as an alternative to including pre-injection units in the injection well permit, and explicitly stating the design standards that will apply to all covered pre-injection units. In addition, the requirement to include pre-injection units in a permit or registration is synchronized with renewal of the injection well permit. The adopted rules do not require more from an applicant than is required by current rules, which require that pre-injection units be included in the injection well permit. Since the adopted rules do not require more than would be required by application of the current rules, they do not burden an owner of real property in a manner which would be a statutory or constitutional taking. Specifically, the adopted rules do not affect a landowner's rights in private real property because they do not burden (constitutionally); nor restrict or

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

CONSISTENCY WITH THE COASTAL MANAGEMENT PROGRAM

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

PUBLIC COMMENT

There was no public hearing held on the proposed rulemaking. One commenter, the Texas Chemical Council (TCC), submitted written comments during the comment period which closed at 5:00 p.m., August 12, 2002.

RESPONSE TO COMMENTS

TCC commented that pre-injection units such as piping and tankage subject to RCRA exemptions (i.e., an exemption for a totally enclosed treatment system or elementary neutralization unit) should be exempt from this rule; and that design, construction, operating, maintenance, monitoring and closure standards already exist for these units under 30 TAC Chapter 335 (relating to Industrial Solid Waste and Municipal Hazardous Waste).

The commission agrees that pre-injection units subject to RCRA exemptions should be exempt from the rule amendments concerning pre-injection units for Class I nonhazardous, noncommercial injection wells and Class V injection wells permitted for the disposal of nonhazardous waste. Under adopted §331.7(d), there is no applicability to hazardous waste pre-injection units. The commission agrees that certain Chapter 335 standards already exist for RCRA exempt units. The commission notes the phrase “and activities” was proposed to be deleted from §331.7(a). Arguably, deleting the phrase “and activities” would exempt hazardous waste pre-injection units from any UIC permit requirement, and would exempt the construction and operation of an injection well from the UIC permit requirement, which was clearly not the intent of the proposed rulemaking. The commission adopts revisions to the proposal, under §331.7(a), by retaining the phrase “and activities” and adding the phrase “and by subsection (d) of this section” to the exceptions phrase of §331.7(a). This achieves the same intended result as the §331.7(a) proposal language by making §331.7(a) and §331.7(d) harmonious, while at the same time reducing the possibility of confusion about the meaning of the permit requirement in §331.7(a). This change from the proposal is made in the adopted rule.

TCC stated that §331.17(d)(3) requires that pre-injection units meet the design standards of Chapter 317, relating to Design Criteria for Sewage Systems, that apply to the type of unit being authorized, and commented that the rule should either cite the specific standard the state requires compliance with or “hard code” or rewrite certain Chapter 317 technical requirements into this section of the rule. TCC stated an understanding that Chapter 317 does not now address design standards for non-hazardous pre-

injection units, but is being revised to do so. TCC commented that it is inappropriate for this rule to reference a rule not yet promulgated.

The commission disagrees with this comment. The commission does not consider it necessary to repeat the existing provisions of Chapter 317 in the new §331.17 rule language. The following provisions of existing Chapter 317 include standards that apply to pre-injection units:

§§317.1(a)(2) - (4), (c), (d), (e)(1) - (3), and (f); 317.2(a) - (c); 317.3; 317.4(a), (c), and (j)(2), (3), (7), (8), and (9); and 317.7. The commission notes that any future changes to Chapter 317 are anticipated to be accomplished by repealing Chapter 317 in its entirety and adopting a new Chapter 217. The commission anticipates that this current rulemaking will be subject to amendment in the future to conform to the anticipated change. Until these amendments are adopted and effective, the requirements of Chapter 317 that exist on the effective date of this current rulemaking will continue to apply. Thus, this adopted rule does not reference a rule change that has not yet been promulgated. With regard to hard coding the requirements into this rulemaking, the commission, for the purposes of this rulemaking, does not consider it appropriate to duplicate rules that already exist. The commission would like to point out that §317.1(f) provides for variance from the design standards, if the variance would not result in an unreasonable risk. This procedure will be available for nonhazardous, noncommercial pre-injection units. Requests for such variances must be in writing and include a detailed engineering justification. Also, applicants for UIC permits and pre-injection registrations may request a pre-application meeting to discuss application requirements with permitting staff. Finally, the commission anticipates that guidance for registration of pre-injection units will be included in the

registration application and that the application will include a checklist of the applicable requirements for pre-injection units. The commission has made no change to the proposed text in response to this comment.

TCC stated that §331.17(e) requires corrective action for pre-injection units under §331.44 and commented that the current requirements of §331.44 are specific to injection wells and are not applicable to pre-injection units. TCC further commented that releases from the pre-injection units are already regulated under existing Chapter 327, relating to Spill Prevention and Control, and that Chapter 327 is the more appropriate reference for this section.

The commission partially agrees with this comment. The commission believes that it has several remedies for releases from pre-injection units. These include, but are not limited to, action under §331.44, relating to Corrective Action Standards, for which a decision on applicability will be made on a case-by-case basis; §331.5(b), relating to Prevention of Pollution; and Chapter 327. It is not necessary to specifically cite §331.44 in the adopted rule because the commission's remedies for the cleanup of sites are cumulative and not in the alternative. In other words, any or all of the remedies may apply, depending on the circumstances, and if the agency decides to apply one of the remedies, that decision does not rule out consideration of any of the other remedies. The commission has deleted §331.17(e) in response to this comment.

TCC stated that §331.18(b)(6) requires the seal of a professional engineer (P.E.) to plans and specifications of pre-injection units. TCC commented that some units are reasonably old and the as-

built drawings likely no longer exist. TCC recommended that, as already provided for in Section XII of the Class I Injection Well permit application, facilities should have the option to submit detailed plans and specifications of well-associated surface units prepared and sealed by a P.E., a description of secondary containment and spill overflow protection, a description of inspection schedules, recordkeeping, and reporting for the pre-injection units.

The commission disagrees with this comment. The purpose of this rulemaking is to provide consistency in the technical standards for and review of pre-injection units. Applicants will have the option to include a pre-injection unit in the UIC permit or in the pre-injection unit registration. The application forms will be revised upon adoption of this rule to reflect this option. As to the concern about the nonexistence of as-built drawings for older units, engineering plans, specifications, and other related documents submitted to the agency must follow requirements of the Texas Engineering Practice Act (Texas Civil Statutes, Article 3271a, §15(c)). The P.E. should consult the Texas Board of Professional Engineers if there is uncertainty about how to meet this requirement for a specific situation. The commission has made no change to the proposed text in response to this comment.

TCC stated that §331.18(b)(7) requires attachment of technical reports and supporting data required by the application. TCC expressed the hope that when the agency develops detailed guidance for registering pre-injection units there will be an explanation of what is required by this section.

The commission agrees with this comment. The commission anticipates that guidance for registration of pre-injection units will be included in the registration application and that the application will include a checklist of the applicable requirements for pre-injection units. The commission has made no change to the proposed text in response to this comment.

TCC commented that §331.18(e) does not appear to be consistent with 30 TAC Chapter 39, relating to Public Notice, and that the commission should revise the language in this section to make it consistent with Chapter 39 or reference the appropriate sections in Chapter 39.

The commission agrees with this comment. A notice exemption to address this issue is contained in a proposed amendment to Chapter 39 which was published in the September 6, 2002 issue of the *Texas Register* (27 TexReg 8411). This rule was not published with the amendments to Chapter 331 because of sequencing rules governing publication in the *Texas Register* (1 TAC §91.65(a)(3)). In other words, the proposed publication of §39.403, relating to Applicability, was delayed until a previous rulemaking to amend that section was adopted and became effective. The adoption of the most recent amendment to §39.403 which applies to this rulemaking is published in this issue of the *Texas Register*. The commission has made no change to the proposed text in response to this comment.

TCC stated that §331.47(b) requires that surface impoundments meet the design standards contained in Chapter 317, and commented that it is improper to cite a rule that currently does not address design standards for pre-injection units, but is being revised to do so. TCC reiterated their previous comment that it is inappropriate for the commission to reference a rule change not yet promulgated.

The commission disagrees with this comment. Any future changes to Chapter 317 are anticipated to be accomplished by repealing Chapter 317 in its entirety and adopting a new Chapter 217.

This adopted rule on pre-injection units references the existing Chapter 317, and does not reference a rule change that has not yet been promulgated. Applicable standards for surface impoundments are found in the provisions of §317.4(a), (c), and (j)(2), (3), (7), (8), and (9). It should be noted that §317.1(f) provides for variance from the design standards if the variance would not result in an unreasonable risk. This procedure will be available for nonhazardous, noncommercial pre-injection units. Requests for such variances must be in writing and include a detailed engineering justification. The commission has made no change to the proposed text in response to this comment.

SUBCHAPTER A: GENERAL PROVISIONS

§§331.2, 331.5, 331.7, 331.17, 331.18

STATUTORY AUTHORITY

The amendments and new sections are adopted under TWC, §5.103, which provides the commission with authority to adopt any rules necessary to carry out its powers and duties under this code and other laws of this state and to adopt rules repealing any statement of general applicability that interprets law or policy; §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; and §27.019, which requires the commission to adopt rules reasonably required for the regulation of injection wells. The amendments and new sections are also adopted under THSC, §361.017 and §361.024, which provide the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Solid Waste Disposal Act. The amendments and new sections are also adopted under THSC, §401.051, which provides the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Radiation Control Act.

§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, shall have the following meanings, unless the context clearly indicates otherwise.

(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 an injection well for disposal of waste, or of pre-injection units for processing or storage of waste.

(3) **Affected person** - Any person whose legal rights, duties, or privileges may be adversely 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 well** - A Class V injection well used for 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) **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 one fourth of a mile or a number calculated according to the criteria set forth in §331.42 of this title.

(10) **Area permit** - An injection well permit which authorizes the construction and operation of two or more similar injection wells within a specified area.

(11) **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.

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

(13) **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).

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

(15) **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.

(16) **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.

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

(18) **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.

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

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

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

(22) **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.

(23) **Commercial well** - A UIC 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.

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

(25) **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 (USDW) or freshwater aquifer.

(26) **Confining zone** - A part of a formation, a formation, or group of formations between the injection zone and the lowermost USDW or freshwater aquifer that acts as a barrier to the movement of fluids out of the injection zone.

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

(28) **Control parameter** - Any chemical constituent of groundwater monitored on a routine basis used to detect or confirm the presence of mining solutions in a designated monitor well.

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

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

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

(32) **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.

(33) **Excursion** - The movement of mining solutions into a designated monitor well.

(34) **Existing injection well** - A Class I well which was authorized by an approved state or EPA-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).

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

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

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

(38) **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 subchapter, 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 ground water contains fewer than 10,000 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.

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

(40) **Groundwater protection area** - A geographic area (delineated by the state under the 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.

(41) **Hazardous waste** - Hazardous waste as defined in §335.1 of this title.

(42) **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.

(43) **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.

(44) **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.

(45) **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.

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

(47) **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.

(48) **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.

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

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

(51) **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.

(52) **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.

(53) **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."

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

(55) **Mine plan** - A map of adopted mine areas and an estimated schedule indicating the sequence and timetable for mining and any required aquifer restoration.

(56) **Monitor well** - Any well used for the sampling or measurement of any chemical or physical property of subsurface strata or their contained fluids.

(A) Designated monitor wells are those listed in the production area authorization for which routine water quality sampling 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.

(57) **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.

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

(59) **New waste stream** - A waste stream not permitted.

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

(61) **Non-commercial UIC Class I well facility** - A UIC Class I permitted facility where only non-commercial wells are operated.

(62) **Non-commercial well** - A UIC 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.

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

(64) **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.

(65) **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.

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

(67) **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.

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

(69) **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.

(70) **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.

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

(72) **Production area authorization** - A document, issued under the terms of an injection well permit, approving the initiation of mining activities in a specified production area within a permit area.

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

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

(75) **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.

(76) **Restored aquifer** - An aquifer whose local groundwater quality has, by natural or artificial processes, returned to levels consistent with restoration table values or better as verified by an approved sampling program.

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

(78) **Salt cavern confining zone** - A zone between the salt cavern injection zone and all USDWs and freshwater aquifers, that acts as a barrier to movement of waste out of a salt cavern injection zone, and consists of the entirety of the salt stock excluding any portion of the salt stock designated as a UIC Class I salt cavern injection zone or any portion of the salt stock occupied by a UIC Class II or Class III salt cavern or its disturbed salt zone.

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

(80) **Salt cavern injection zone** - The void space of a salt cavern that receives waste through a well, plus that portion of the salt stock enveloping the salt 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.

(81) **Salt cavern solid waste disposal well or salt cavern disposal well** - For the purposes of this chapter relating to Underground Injection Control, regulations of the commission, and not to 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 hazardous, industrial, or municipal waste into a salt cavern for the purpose of storage or disposal of the waste.

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

(83) **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.

(84) **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.

(85) **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.

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

(87) **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.

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

(89) **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 a USDW.

(90) **Total dissolved solids (TDS)** - The total dissolved (filterable) solids as determined by use of the method specified in 40 CFR Part 136, as amended.

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

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

(93) **Underground injection control (UIC)** - The program under the federal Safe Drinking Water Act, Part C, including the approved Texas state program.

(94) **Underground source of drinking water (USDW)** - An "aquifer" or its portions:

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

(B) in which the groundwater contains fewer than 10,000 mg/l total dissolved solids; and

(C) which is not an exempted aquifer.

(95) **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.

(96) **Verifying analysis** - A second sampling and analysis of control parameters for the purpose of confirming a routine sample analysis 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.

(97) **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.

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

(99) **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.

(100) **Well stimulation** - Several processes used to clean the well bore, enlarge channels, and increase pore space in the interval to be injected thus making it possible for wastewater to move more readily into the formation, including, but not limited to surging, jetting, blasting, acidizing, and hydraulic fracturing.

(101) **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.

§331.5. Prevention of Pollution.

(a) No permit or authorization by rule shall be allowed where an injection well causes or allows the movement of fluid that would result in the pollution of an underground source of drinking water. A permit or authorization by rule shall include terms and conditions reasonably necessary to protect fresh water from pollution.

(b) Persons authorized to conduct underground injection activities under this chapter shall address unauthorized discharges of chemicals of concern (COCs) from associated tankage and equipment according to the requirements of Chapter 350 of this title (relating to the Texas Risk Reduction Program).

(c) Pre-injection units which are required to be authorized by permit or registration under §331.7(d) of this title (relating to Permit Required), must be designed, constructed, operated, maintained, monitored, and closed so as not to cause:

(1) the discharge or imminent threat of discharge of waste into or adjacent to the waters in the state without obtaining specific authorization for such a discharge from the commission;

(2) the creation or maintenance of a nuisance; or

(3) the endangerment of the public health and welfare.

§331.7. Permit Required.

(a) Except as provided in §331.9 of this title (relating to Injection Authorized by Rule) and by subsection (d) of this section, all injection wells and activities must be authorized by 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 or a septic system which accepts industrial waste must obtain a wastewater discharge permit in accordance with Texas Water Code, Chapter 26 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).

§331.17. Pre-Injection Units Registration.

(a) Pre-injection units not otherwise authorized under this chapter must be registered in accordance with the requirements of this section.

(b) No registration shall be approved, and registrations may be denied or revoked, if the executive director determines that:

(1) a pre-injection unit causes or allows the release of fluid that would result in the pollution of underground sources of drinking water, fresh water, or surface water; or

(2) a pre-injection unit poses an immediate threat to public health or safety.

(c) Registration procedures for pre-injection units not otherwise authorized under this chapter must include the following.

(1) The owner or operator shall submit an application for registration to the executive director, in accordance with the applicable requirements of this subchapter;

(A) for any proposed pre-injection unit, obtain approval of the registration before operating the pre-injection unit; or

(B) for any existing unauthorized pre-injection unit, submit the application on or before the date the injection well permit renewal application is submitted.

(2) The owner or operator shall cease operation of any pre-injection unit if:

(A) the registration application for an existing pre-injection unit has not been submitted before approval of the injection well permit renewal;

(B) renewal of the registration is denied by the executive director;

(C) the term of the registration expires, however, if registration renewal procedures have been initiated before the permit expiration date, the existing registration will remain in full force and effect and will not expire until commission action on the application for renewal of the registration is final;

(D) the registration is denied or revoked by the executive director; or

(E) the executive director determines that the unit poses an immediate threat to public health or safety.

(d) Design criteria are as follows:

(1) pre-injection units shall be designed in such a manner as to protect underground sources of drinking water, fresh water, and surface water from pollution;

(2) pre-injection units shall be designed in such a manner as to enable the authorized injection well to meet all permit conditions and applicable rules and law;

(3) pre-injection units shall meet the design standards contained in Chapter 317 of this title (relating to Design Criteria for Sewerage Systems) which apply to the type of unit being proposed; and

(4) all ponds shall be lined according to the requirements of §331.47 of this title (relating to Pond Lining).

§331.18. Registration Application, Processing, Notice, Comment, Motion to Overturn.

(a) Applicability. This section sets forth the requirements for applications and the manner in which action will be taken on applications filed for a registration for pre-injection units.

(b) Contents of application. Registration applications for pre-injection units must include:

(1) complete application form(s), signed and notarized, and required number of copies provided;

(2) the verified legal status of the applicant(s) as applicable;

(3) the signature of the applicant(s), in accordance with the requirements of §305.44 of this title (relating to Signatories to Applications);

(4) a notarized affidavit from the applicant(s) verifying land ownership or landowner agreement to the proposed activity. Pre-injection unit registration information on file with the commission shall be confirmed or updated, in writing, no later than 30 days after:

(A) the mailing address and/or telephone number of the owner or operator is changed; or

(B) requested by the commission or executive director;

(5) maps showing:

(A) the name and address of persons who own the property on which the existing or proposed pre-injection unit is or will be located, if different from the applicant; and

(B) the name and address of landowners adjacent to the property on which the pre-injection unit is located or is proposed to be located.

(6) plans and specifications of the pre-injection units which have the seal of a professional engineer licensed in the State of Texas. The engineer shall certify that the submission meets the applicable technical requirements of Chapter 317 of this title (relating to Design Criteria for Sewerage Systems);

(7) the attachment of technical reports and supporting data required by the application;

and

(8) any other information the executive director or the commission may reasonably require.

(c) Administrative completeness. Upon receipt of an application for a registration, the executive director or his designee shall assign the application a number for identification purposes. Applications for registrations shall be reviewed by the staff for administrative completeness within the period specified by §281.3(a) of this title (relating to Initial Review).

(d) Technical completeness. When the application is declared to be technically complete, the executive director or his designee shall prepare a statement of the receipt of the application and declaration of technical completeness which is suitable for mailing and shall forward that statement to the chief clerk. The chief clerk shall notify every person entitled to notification as stated in subsection (e) of this section. The notice of receipt of an application for registration and declaration of technical completeness shall contain the following information:

(1) the location of the pre-injection unit;

(2) the identifying number given the application by the executive director;

(3) the type of registration sought under the application;

(4) the name, address, and telephone number of the applicant and the name and address of the agency and the telephone number of an agency contact from whom interested persons may obtain further information about the application to register the unit;

(5) the date on which the application was submitted;

(6) a brief summary of the information included in the application;

(7) a statement that the registration application has been provided to the county judge and that it is available for review by interested parties;

(8) a brief description of public comment procedures; and

(9) the deadline to file public comment. The deadline shall be not less than 30 days after the date notice is mailed.

(e) Notice requirements.

(1) The public notice requirements of this subsection apply to new applications for a registration, and to applications for major amendment or renewal of a registration for pre-injection units.

(2) The chief clerk of the commission shall mail Notice of Receipt of Application and Technical Completeness, along with a copy of the registration application, to the county judge in the county where the pre-injection unit is located or proposed to be located.

(3) The chief clerk of the commission shall mail Notice of Receipt of Application and Technical Completeness to the adjacent landowners named on the application map or supplemental map, or the sheet attached to the application map or supplemental map.

(f) Application processing procedures. Any person who is required to obtain approval of a registration, or who requests an amendment, modification, or renewal of a registration for pre-injection units is subject to the application processing procedures and requirements found in Chapter 281 of this title (relating to Application Processing).

(g) Major amendment. A major amendment is an amendment that changes a substantive term, provision, requirement, or a limiting parameter of a registration. Notice requirements of subsection (e) of this section are applicable to major amendments.

(h) Minor amendment. A minor amendment is an amendment to improve or maintain the quality or method of management of waste, and includes any other change to a registration issued under this chapter that will not cause or relax a standard or criterion which may result in a potential deterioration of quality of waters in the state. Notice requirements of subsection (e) of this section are not applicable to minor amendments.

(i) Public comment on registrations. A person may provide the commission with written comments on any new, major amendment, or renewal applications to register pre-injection units. The executive director shall review any written comments received within the public comment period. The written information received shall be utilized by the executive director in determining what action to take on the application for registration, in accordance with §331.17 of this title (relating to Registration of Pre-Injection Units). After the deadline for submitting public comment, the executive director may take final action on the application.

(j) Delegation, effective date of registration, term. The commission delegates to the executive director the authority to approve pre-injection unit registrations. The effective date for the registration of a site at which pre-injection units are located is the date that the executive director by letter, approves the application. The term for registration shall not exceed ten years and shall be synchronized with the term of the injection well permit.

(k) Motion to overturn. The applicant or a person affected may file with the chief clerk a motion to overturn the executive director's final approval of an application, under §50.139(b) - (f) of this title (relating to Motion to Overturn).

SUBCHAPTER C: GENERAL STANDARDS AND METHODS

§331.47

STATUTORY AUTHORITY

The amendment is adopted under TWC, §5.103, which provides the commission with authority to adopt any rules necessary to carry out its powers and duties under this code and other laws of this state and to adopt rules repealing any statement of general applicability that interprets law or policy; §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; and §27.019, which requires the commission to adopt rules reasonably required for the regulation of injection wells. The amendment is also adopted under THSC, §361.017 and §361.024, which provide the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Solid Waste Disposal Act. The amendment is also adopted under THSC, §401.051, which provides the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Radiation Control Act.

§331.47. Pond Lining.

(a) Except as provided in subsection (b) of this section, all holding ponds, emergency overflow ponds, emergency storage ponds, or other surface impoundments associated with, or part of the pre-injection units associated with underground injection wells shall be lined with clay or an artificial liner as approved by the executive director or as required by permit, and shall in addition, conform to any

applicable requirements of Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste).

(b) All surface impoundments for nonhazardous, noncommercial Class 1 industrial waste associated with Class I nonhazardous, noncommercial injection wells, or Class V injection wells permitted for the disposal of nonhazardous waste, shall meet the design standards contained in Chapter 317 of this title (relating to Design Criteria for Sewerage Systems) which apply to surface impoundments.

SUBCHAPTER G: CONSIDERATION PRIOR TO PERMIT ISSUANCE

§331.121

STATUTORY AUTHORITY

The amendment is adopted under TWC, §5.103, which provides the commission with authority to adopt any rules necessary to carry out its powers and duties under this code and other laws of this state and to adopt rules repealing any statement of general applicability that interprets law or policy; §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; and §27.019, which requires the commission to adopt rules reasonably required for the regulation of injection wells. The amendment is also adopted under THSC, §361.017 and §361.024, which provide the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Solid Waste Disposal Act. The amendment is also adopted under THSC, §401.051, which provides the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Radiation Control Act.

§331.121. Class I Wells.

(a) The commission shall consider the following before issuing a Class I Injection Well Permit:

(1) all information in the completed application for permit;

(2) all information in the Technical Report submitted with the application for permit in accordance with §305.45(a)(8) of this title (relating to Contents of Application for Permit) including, but not limited to:

(A) a map showing the location of the injection well for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number, or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells, and other pertinent surface features, including residences and roads. The map should also show faults, if known or suspected. Only information of public record is required to be included on this map;

(B) a tabulation of all wells within the area of review which penetrate the injection zone or confining zone, and for salt cavern disposal wells, the salt cavern injection zone, salt cavern confining zone and caprock. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the executive director may require;

(C) the protocol followed to identify, locate, and ascertain the condition of abandoned wells within the area of review which penetrate the injection or the confining zones;

(D) maps and cross-sections indicating the general vertical and lateral limits of underground sources of drinking water (USDWs) and freshwater aquifers, their positions relative to the

injection formation and the direction of water movement, where known, in each USDW or freshwater aquifer which may be affected by the proposed injection;

(E) maps, cross-sections, and description of the geologic structure of the local area;

(F) maps, cross-sections, and description of the regional geologic setting;

(G) proposed operating data:

(i) average and maximum daily injection rate and volume of the fluid or waste to be injected over the anticipated life of the injection well;

(ii) average and maximum injection pressure;

(iii) source of the waste streams;

(iv) an analysis of the chemical and physical characteristics of the waste streams;

(v) for salt cavern waste disposal, the bulk waste density, permeability, porosity, and compaction rate, as well as the individual physical characteristics of the wastes and transporting media;

(vi) for salt cavern waste disposal, the results of tests performed on the waste to demonstrate that the waste will remain solid under cavern conditions; and

(vii) any additional analyses which the executive director may reasonably require;

(H) proposed formation testing program to obtain an analysis of the chemical, physical, and radiological characteristics of formation fluids, and other information on the injection zone and confining zone;

(I) proposed stimulation program, if needed;

(J) proposed operation and injection procedures;

(K) engineering drawings of the surface and subsurface construction details of the injection well and pre-injection units, except that pre-injection units registered under the provisions of §331.17 of this title (relating to Pre-Injection Units Registration) shall be considered under that section;

(L) contingency plans, based on a reasonable worst case scenario, to cope with all shut-ins; loss of cavern integrity, or well failures so as to prevent migration of fluid into any USDW;

(M) plans (including maps) for meeting the monitoring requirements of this chapter, such plans shall include all parameters, test methods, sample methods, and quality assurance procedures necessary and used to meet these requirements;

(N) for wells within the area of review which penetrate the injection zone or confining zone but are not adequately constructed, completed, or plugged, the corrective action proposed to be taken;

(O) construction procedures including a cementing and casing program, contingency cementing plan for managing lost circulation zones and other adverse subsurface conditions, well materials specifications and their life expectancy, logging procedures, deviation checks, and a drilling, testing, and coring program;

(P) delineation of all faults within the area of review, together with a demonstration, unless previously demonstrated to the commission or to the United States Environmental Protection Agency, that the fault is not sufficiently transmissive or vertically extensive to allow migration of hazardous constituents out of the injection zone;

(Q) the authorization status under this chapter of the pre-injection units for the injection well; and

(R) information demonstrating compliance with the applicable design criteria of Chapter 317 of this title (relating to Design Criteria for Sewerage Systems), for pre-injection units associated with Class I nonhazardous, noncommercial injection wells.

(3) whether the applicant will assure, in accordance with Chapter 37, Subchapter Q of this title (relating to Financial Assurance for Underground Injection Control Wells), the resources necessary to close, plug, abandon, and if applicable, provide post-closure care for the well and/or waste disposal cavern as required;

(4) the closure plan, corrective action plan, and post-closure plan submitted in the technical report accompanying the permit application;

(5) any additional information required by the executive director for the evaluation of the proposed injection well.

(b) In determining whether the use or installation of an injection well is in the public interest under Texas Water Code, §27.051(a)(1), the commission shall also consider:

(1) the compliance history of the applicant in accordance with Texas Water Code, §27.051(e) and §281.21(d) of this title (relating to Draft Permit, Technical Summary, Fact Sheet, and Compliance Summary);

(2) whether there is a practical, economic and feasible alternative to an injection well reasonably available to manage the types and classes of hazardous waste;

(3) if the injection well will be used for the disposal of hazardous waste, whether the applicant will maintain liability coverage for bodily injury and property damage to third parties that is caused by sudden and nonsudden accidents in accordance with Chapter 37 of this title (relating to Financial Assurance); and

(4) that any permit issued for a Class I injection well for disposal of hazardous wastes generated on site requires a certification by the owner or operator that:

(A) the generator of the waste has a program to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable; and

(B) injection of the waste is that practicable method of disposal currently available to the generator which minimizes the present and future threat to human health and the environment.

(c) The commission shall consider the following minimum criteria for siting before issuing a Class I injection well permit.

(1) All Class I injection wells shall be sited such that they inject into a formation that is beneath the lowermost formation containing, within 1/4 mile of the wellbore, a USDW or freshwater aquifer.

(2) The siting of Class I injection wells shall be limited to areas that are geologically suitable. The executive director shall determine geologic suitability based upon:

(A) an analysis of the structural and stratigraphic geology, the hydrogeology, and the seismicity of the region;

(B) an analysis of the local geology and hydrogeology of the well site, including, at a minimum, detailed information regarding stratigraphy, structure, and rock properties, aquifer hydrodynamics, and mineral resources; and

(C) a determination that the geology of the area can be described confidently and that limits of waste fate and transport can be accurately predicted through the use of analytical and numerical models.

(3) Class I injection wells shall be sited such that:

(A) the injection zone has sufficient permeability, porosity, thickness, and areal extent to prevent migration of fluids into USDWs or freshwater aquifers;

(B) the confining zone:

(i) is laterally continuous and free of transecting, transmissive faults or fractures over an area sufficient to prevent the movement of fluids into a USDW or freshwater aquifer;
and

(ii) contains at least one formation of sufficient thickness and with lithologic and stress characteristics capable of preventing initiation and/or propagation of fractures.

(4) The owner or operator shall demonstrate to the satisfaction of the executive director that:

(A) the confining zone is separated from the base of the lowermost USDW or freshwater aquifer by at least one sequence of permeable and less permeable strata that will provide an added layer of protection for the USDW or freshwater aquifer in the event of fluid movement in an unlocated borehole or transmissive fault; or

(B) within the area of review, the piezometric surface of the fluid in the injection zone is less than the piezometric surface of the lowermost USDW or freshwater aquifer,

considering density effects, injection pressures, and any significant pumping in the overlying USDW or freshwater aquifer; or

(C) there is no USDW or freshwater aquifer present;

(D) the commission may approve a site which does not meet the requirements in subparagraphs (A), (B), or (C) of this paragraph if the owner or operator can demonstrate to the commission that because of the geology, nature of the waste, or other considerations, that abandoned boreholes or other conduits would not cause endangerment of USDWs, and fresh or surface water.

(d) The commission shall also consider the following additional information, which must be submitted in the technical report of the application as part of demonstrating that the facility will meet the performance standard in §331.162 of this title (relating to Performance Standard), before issuing a salt cavern Class I injection well permit:

(1) a thorough characterization of the salt dome to establish the geologic suitability of the location, including:

(A) data and interpretation from all appropriate geophysical methods (such as well logs, seismic surveys, and gravity surveys), subject to the approval of the executive director, necessary to:

(i) map the overall geometry of the salt dome, including all edges and any suspected overhangs of the salt stock;

(ii) demonstrate the existence of a minimum distance of 500 feet between the boundaries of the proposed salt cavern injection zone and the boundaries of the salt stock;

(iii) define the composition and map the top and thickness of the sedimentary rock units between the caprock and surface, including the flanks of the salt stock;

(iv) define the composition and map the top and thickness of the caprock overlying the salt stock;

(v) map the top of the salt stock;

(vi) calculate the movement and the salt loss rate of the salt stock;

(vii) define any other caverns and other uses of the salt dome, and address any conditions that may result in potential adverse impact on the salt dome; and

(viii) satisfy any other requirement of the executive director necessary to demonstrate the geologic suitability of the location;

(B) a surface-recorded three-dimensional seismic survey, subject to the following minimum requirements:

(i) the lateral extent of the survey will be determined by the executive director; and

(ii) the survey must provide information as part of demonstrating that the location is geologically suitable for the purpose of meeting the performance standard in §331.162 of this title;

(C) identification of any unusual features, such as depressions or lineations observable at the land surface or within or detectable within the subsurface, which may be indicative of underlying anomalies in the caprock or salt stock, which might affect construction, operation, or closure of the cavern;

(D) the petrology of the caprock, salt stock, and deformed strata; and

(E) for strata surrounding the salt stock, information on their nature, structure, hydrodynamic properties, and relationships to USDWs, including a demonstration that the proposed salt cavern injection zone will not be in or above a formation which within 1/4 mile of the salt cavern injection zone contains a USDW;

(2) establishment of a pre-development baseline for subsidence and groundwater monitoring, over the area of review;

(3) characterization of the predicted impact of the proposed operations on the salt stock, specifically the extent of the disturbed zone;

(4) demonstration of adequate separation between the outer limits of the injection zone and any other activities in the domal area. The thickness of the disturbed zone, as well as any additional safety factors will be taken into consideration; and

(5) the commission will consider the presence of salt cavern storage activities, sulfur mining, salt mining, brine production, oil and gas activity, and any other activity which may adversely affect or be affected by waste disposal in a salt cavern.

(e) Information requirements for Class I hazardous waste injection well permits.

(1) The following information is required for each active Class I hazardous waste injection well at a facility seeking an underground injection control permit:

(A) dates well was operated; and

(B) specification of all wastes that have been injected in the well, if available.

(2) The owner or operator of any facility containing one or more active hazardous waste injection wells must submit all available information pertaining to any release of hazardous waste or constituents from any active hazardous waste injection well at the facility.

(3) The owner or operator of any facility containing one or more active Class I hazardous waste injection wells must conduct such preliminary site investigations as are necessary to determine whether a release is occurring, has occurred, or is likely to have occurred.

(f) Interim Status under the RCRA for Class I hazardous waste injection wells. The minimum state standards which define acceptable injection of hazardous waste during the period of interim status are set out in this chapter. The issuance of an underground injection well permit does not automatically terminate RCRA interim status. A Class I well's interim status does, however, automatically terminate upon issuance of a RCRA permit for that well, or upon the well's receiving a RCRA permit-by-rule under §335.47 of this title (relating to Special Requirements for Persons Eligible for a Federal Permit by Rule). Thus, until a Class I well injecting hazardous waste receives a RCRA permit or RCRA permit-by-rule, the well's interim status requirements are the applicable requirements imposed under this chapter, including any requirements imposed in the UIC permit.

(g) Before issuing a permit for a hazardous waste injection well in a solution-mined salt dome cavern, the commission by order must find that there is an urgent public necessity for the hazardous waste injection well. The commission, in determining whether an urgent public necessity exists for the permitting of the hazardous waste injection well in a solution-mined salt dome cavern, must find that:

(1) the injection well will be designed, constructed, and operated in a manner that provides at least the same degree of safety as required of other currently operating hazardous waste disposal technologies;

(2) consistent with the need and desire to manage the state hazardous wastes generated in the state, there is a substantial or obvious public need for additional hazardous waste disposal capacity and the hazardous waste injection well will contribute additional capacity toward servicing that need;

(3) that the injection well will be constructed and operated in a manner so as to safeguard public health and welfare and protect physical property and the environment;

(4) the applicant has demonstrated that groundwater and surface waters, including public water supplies, will be protected from the release of hazardous waste from the salt dome waste containment cavern; and

(5) any other criteria required by the commission to satisfy that the test of urgency has been met.

SUBCHAPTER J: STANDARDS FOR CLASS I SALT CAVERN

SOLID WASTE DISPOSAL WELLS

§331.163

STATUTORY AUTHORITY

The amendment is adopted under TWC, §5.103, which provides the commission with authority to adopt any rules necessary to carry out its powers and duties under this code and other laws of this state and to adopt rules repealing any statement of general applicability that interprets law or policy; §5.105, which authorizes the commission to establish and approve all general policy of the commission by rule; and §27.019, which requires the commission to adopt rules reasonably required for the regulation of injection wells. The amendment is also adopted under THSC, §361.017 and §361.024, which provide the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Solid Waste Disposal Act. The amendment is also adopted under THSC, §401.051, which provides the commission with authority to adopt rules necessary to carry out its powers and duties under the Texas Radiation Control Act.

§331.163. Well Construction Standards.

(a) Plans and specifications. Except as specifically required in the terms of the disposal well permit, drilling and completion of the well shall be done in accordance with all permit application plans and specifications. Any proposed changes to the plans and specifications must be approved in writing

by the executive director that said changes provide protection standards equivalent to or greater than the original design criteria.

(b) Casing and cementing.

(1) All Class I salt cavern disposal wells shall be cased and all casings which extend to the surface shall be cemented to the surface to prevent the movement of fluids and waste into or between underground sources of drinking water (USDWs) or freshwater aquifers, and to prevent potential leaks of fluids and waste from the well. Cementing shall be by the pump and plug or other method approved by the commission, and cement circulated shall be of a volume equivalent to at least 120% of the calculated volume needed to fill the annular space between the hole and casing and between casing strings to the surface of the ground. Circulation of cement may be accomplished by staging. The executive director may approve an alternative method of cementing in cases where the cement cannot be recirculated to the surface, provided the owner or operator can demonstrate by using logs that the cement is continuous or does not allow any fluid and waste movement behind the well casings. Casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well, including the post-closure care period.

(A) Surface casing shall be set to a minimum subsurface depth, as determined by the executive director, which extends into a confining bed below the lowest formation containing a USDW or freshwater aquifer.

(B) At least one string of intermediate casing, using a sufficient number of centralizers, shall extend at least 100 feet into the salt stock.

(C) At least one long string casing, using a sufficient number of centralizers, shall extend into the salt stock, to the following depths, whichever is greater:

(i) 500 feet into the salt stock; or

(ii) 500 feet below any rock type of recognizable thickness as determined by logging, which is different from salt, and that is hydraulically connected to formations outside the salt stock. For the purposes of this rule, all rock types of recognizable thickness on logs which are different from salt shall be assumed to be in hydraulic connection unless demonstrated otherwise.

(2) In determining and specifying casing and cementing requirements, the following factors shall be considered:

(A) depth of lowermost USDW or freshwater aquifer;

(B) depth to the injection zone;

(C) injection pressure, external pressure, internal pressure, and axial loading;

(D) hole size;

(E) size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);

(F) the maximum burst and collapse pressures, and tensile stresses which may be experienced at any point along the length of the casings at any time during the construction, operation, and closure of the well;

(G) corrosive effects of injected materials, formation fluids, and temperatures;

(H) lithology of injection and confining zones;

(I) types and grades of cement;

(J) quantity and chemical composition of the injected fluid; and

(K) cement and cement additives which must, at a minimum, be of sufficient quality and quantity to maintain integrity over the design life of the well.

(c) Injection tubings. Except for circulation of drilling fluids during well construction, all injection activities for salt cavern construction and waste disposal in a salt cavern shall be performed using two concentric and removable injection tubings suspended from the wellhead.

(1) All injection activities during cavern construction shall be performed with the annulus between the tubing and long string casing filled with a noncorrosive fluid sufficient to protect the bond between salt, cement, and the long string casing seat.

(2) All injection of waste into a salt cavern shall be performed through the inner tubing with a packer to seal the annulus between the tubing and long string casing near the bottom of the long string casing.

(d) Well annulus system factors for consideration. All elements of the design of the well's tubing-long string casing annulus system, including the outer tubing and packer, shall be approved by permit or by the executive director's approval that any proposed modifications to the plans and specifications in the permit application will provide protection equivalent to or greater than the original plans and specifications. In determining and specifying requirements for a tubing and packer system, the following factors shall be considered:

(1) depth of setting;

(2) characteristics of injection fluid and waste;

- (3) injection pressure;
- (4) annular pressure;
- (5) rate, temperature, and volume of injected fluid;
- (6) size of casing; and
- (7) tensile, burst, and collapse strengths of the tubing.

(e) Logs and tests.

(1) Geophysical logging. Appropriate logs and other tests shall be conducted during the drilling and construction phases of the well including drilling into the salt. All logs and tests shall be interpreted by the service company which processed the logs or conducted the test; or by other qualified persons. A minimum of the following logs and tests shall be conducted:

(A) deviation checks on all holes, conducted at sufficiently frequent intervals to assure that avenues for fluid migration in the form of diverging holes are not created during drilling;

(B) a spontaneous potential and resistivity log for all formations overlying the caprock;

(C) from the ground surface or from the base of conductor casing to the total investigated depth including all core hole or pilot hole:

- (i) natural gamma ray log;
- (ii) compensated density and neutron porosity logs;
- (iii) acoustic or sonic log;
- (iv) inclination (directional) survey; and
- (v) caliper log (open hole);

(D) from the ground surface or from the base of conductor casing to the lowermost casing seat:

- (i) cement bond with variable density log;
- (ii) temperature log (cased hole); and
- (iii) casing inspection log;

(E) fracture detector log from the base of the surface casing to the total investigated depth including all core hole or pilot hole; and

(F) a vertical seismic profile.

(2) Pressure tests.

(A) After installation and cementing of casings, and prior to drilling out the cemented casing shoe, surface casing shall be pressure tested at mill test pressure or 80% of the calculated internal pressure at minimum yield strength, and the intermediate and long string casing shall be tested to 1,500 pounds per square inch (psi) for 30 minutes, unless otherwise specified by the executive director.

(B) After drilling out the cemented long string casing shoe, and prior to drilling more than 100 feet of core hole or pilot hole below the long string casing shoe, the bond between the salt, cement, and casing shall be tested at a pressure of 0.8 psi per foot of depth.

(C) The pilot hole and/or core hole shall be tested between the long string casing shoe and the total investigated depth, at a casing seat pressure of 0.8 psi per foot of depth.

(3) Coring.

(A) Full-hole continuous cores shall be taken beginning at the top of the caprock, or if caprock is not encountered, from the top of the salt stock, to a total investigated depth of 1,000 feet below the intended cavern floor. Cores shall be analyzed at sufficient frequency to provide representative data for the caprock, salt cavern confining zone, and the salt cavern injection zone, including permeability, porosity, bulk density, compressive strength (uniaxial), shear strength (triaxial), water content, and compatibility with permitted waste material. The full-hole, continuous cores shall be photographed for permanent records. The photographs of the cores shall be submitted to the commission as a part of the well completion report as required by §331.167(a)(1) of this title (relating to Reporting Requirements). The cores shall be archived at a facility approved by the executive director. The photos and cores will be maintained as public records.

(B) In situ permeability, lithostatic gradients, and fracture pressure gradients shall be determined in the core hole for the salt, within the cavern injection interval.

(C) Prior to commencement of injection for cavern construction, the pilot hole or core hole shall be filled with salt-saturated cement from total investigated depth back to the designed depth of the salt cavern floor.

(4) Well integrity testing. The mechanical integrity of a well must be demonstrated prior to initiation of injection activities. A mechanical integrity test shall consist of:

(A) a pressure test with liquid or gas;

(B) a temperature, noise log, or oxygen activation log;

(C) a casing inspection log, if required by the executive director; and

(D) any other test required by the executive director.

(f) **Compatibility.** All well materials must be compatible with formations and fluids with which the materials may be expected to come into contact. A well shall be deemed to have compatibility as long as the materials used in the construction of the well meet or exceed standards developed for such materials by the American Petroleum Institute (API), the American Society for Testing Materials (ASTM), or comparable standards acceptable to the executive director.

(g) **Pre-injection units.**

(1) The injection pump system shall be designed to assure that the surface injection pressure limitations authorized by the well permit shall not be exceeded.

(2) Instrumentation shall be installed to continuously monitor changes in annulus pressure and annulus fluid volume for the purpose of detecting well malfunctions.

(3) Pre-injection units, while allowing for pressure release, shall be designed to prevent the release of unauthorized cavern contents to the atmosphere.

(4) To protect the ground surface from spills and releases, the wellhead will have secondary containment in the form of a diked, impermeable pad or sump.

(h) Construction supervision. All phases of well construction and all phases of any well workover shall be supervised by a professional engineer, with current registration pursuant to the Texas Engineering Practice Act, who is knowledgeable and experienced in practical drilling engineering and who is familiar with the special conditions and requirements of injection well construction.

(i) Approval of completion of the well construction stage. Prior to beginning cavern construction, the permittee shall obtain written approval from the executive director which states that the well construction is in compliance with the applicable provisions of the permit. To obtain approval, the permittee shall submit to the executive director within 90 days of completion of well construction, including all logging, coring, and testing of the pilot hole, the following reports and certifications prepared and sealed by a professional engineer with current registration under the Texas Engineering Practice Act:

(1) final construction, "as-built" plans and specifications, reservoir data, and an evaluation of the considerations set out in §331.45(2) of this title (relating to Executive Director Approval of Construction and Completion);

(2) certification that construction of the well has been completed in accordance with the provisions of the disposal well permit and with the design and construction specifications of the permittee's application; and

(3) certification that actual reservoir data obtained will not result in the need for a change in the operating parameters specified in the permit.