The Texas Natural Resource Conservation Commission (TNRCC or commission) proposes amendments to §331.1, Purpose, Scope and Applicability; §331.2, Definitions; §331.3, Injection Prohibited; §331.4, Mechanical Integrity Required; §331.11, Classification of Injection Wells; §331.12, Conversion of Wells, §331.13, Exempted Aquifer; §331.16, Memorandum of Understanding Between the Texas Department of Health and the Texas Natural Resource Conservation Commission Regarding Radiation Control Functions; §331.42, Area of Review; §331.44, Corrective Action Standards; §331.46, Closure Standards; §331.62, Construction Standards; §331.66, Additional Requirements and Conditions; §331.67, Recordkeeping Requirements; §331.68, Post-Closure Care; §331.82, Construction Requirements; §331.105, Monitoring Standards; §331.106, Remedial Action for Excursion; §331.107, Restoration; §331.121, Class I Wells; §331.161, Applicability; §331.163, Well Construction Standards; §331.164, Cavern Construction Standards; §331.165, Waste Disposal Operating Requirements; §331.166, Monitoring and Testing Requirements; §331.167, Reporting Requirements; §331.169, Record-Keeping Requirements; §331.171, Post-Closure Care; §331.182, Area of Review; and §331.183, Construction and Closure Standards.

The commission also proposes a review and readoption of Chapter 331 in accordance with Texas Government Code, §2001.039; and the General Appropriations Act, Article IX, §9-10.13, 76th Legislature, 1999, which require state agencies to review and consider for readoption each of their rules every four years.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE PROPOSED RULES

In accordance with the commission's ongoing regulatory reform initiative, amendments are proposed to update and clarify Chapter 331, Underground Injection Control. The rulemaking also increases compatibility with federal rules. This rulemaking also constitutes the commission's review and readoption of Chapter 331 in accordance with Texas Government Code, §2001.039; and the General Appropriations Act, Article IX, §9-10.13, 76th Legislature, 1999, which require state agencies to review and consider for readoption each of their rules every four years.

SECTION BY SECTION DISCUSSION

Subchapter A: General Provisions

Section 331.1, Purpose, Scope, and Applicability, is proposed to be amended for consistency with the federal rule, 40 Code of Federal Regulations (CFR) Part 148, Hazardous Waste Injection Restrictions.

Section 331.2, Definitions, is proposed to be numbered in accordance with the requirements of the *Texas Register* and to be amended to improve grammar, readability, punctuation, alphabetical organization, and *Texas Register* formating of the definitions of the following terms: abandoned well, activity, aquifer restoration, aquifer storage well, area permit, artificial liner, commercial facility, commercial UIC Class I well facility, cone of influence, existing injection well, formation, fresh water, liner, long string casing or production casing, lost circulation zone, non-commercial facility, non-commercial UIC Class I well facility, non-commercial well, and pre-injection facilities, restored aquifer, underground source of drinking water (USDW), verifying analysis, well, and well stimulation. The definition of "Caprock" is proposed to be amended to insert "calcite" in place of "calcium

carbonate" and to insert "anhydrite" in place of "anhyride" for more precise geological terminology. The definition of "Casing" is proposed for inclusion in this definitions section. The definition of "Hazardous waste" is proposed to be amended to reference Chapter 335. The definition of "Hazardous industrial waste" is proposed to be deleted because this term is not used in the chapter. The definition of "Production area authorization" is proposed to be updated to delete the previous agency name. The definitions of "RCRA" and "SDWA" are proposed to be deleted because the terms are defined in Chapter 3. The definition of "Radioactive material" is proposed to be deleted because this term is not used in the chapter. The definition of "Radioactive waste" is proposed to be amended for consistency with the federal definition in 40 CFR §144.3. The definition of "Total dissolved solids" is proposed to be amended to provide the full federal rule citation.

Section 331.3, Injection Prohibited, is proposed to be amended to correct a cross reference to Chapter 335, Subchapter F and to correct a grammatical error.

Section 331.4, Mechanical Integrity Required, is proposed to be amended to implement the regulatory reform initiative.

Section 331.11, Classification of Injection Wells, is proposed to be amended to improve the clarity of subsection (a)(2). Also, a new subsection (c) is proposed to clarify that monitoring wells and baseline wells which are associated with Class III injection wells, are subject to the rule requirements in this chapter, including construction and completion requirements.

Section 331.12, Conversion of Wells, is proposed to be amended to correct the title of the cross reference to §305.66.

Section 331.13, Exempted Aquifer, is proposed to be amended to delete unnecessary words in subsection (b).

Section 331.16, Memorandum of Understanding Between the Texas Department of Health and the Texas Natural Resource Conservation Commission Regarding Radiation Control Functions, is proposed to be amended to insert the effective date of the memorandum.

Subchapter C: General Standards and Methods

Section 331.42, Area of Review, is proposed to be amended to correct the symbol for the constant "pi" in the Theis equation. In two places, the paragraph mark will be replaced with the symbol for pi.

Section 331.44, Corrective Action Standards, is proposed to be amended to delete the acronym "USDWs" and to conform with *Texas Register* formatting requirements.

Section 331.46, Closure Standards, is proposed to be amended to correct a typographical error in subsection (b)(2).

Subchapter D: Standards for Class I Wells Other Than Salt Cavern Solid Waste Disposal Wells

Section 331.62, Construction Standards, is proposed to be amended to correctly use an acronym for underground source of drinking water and to make a grammatical correction.

Section 331.66(a)(4), Additional Requirements and Conditions, is proposed to be amended to delete unnecessary words.

Section 331.67(c), Recordkeeping Requirements, is proposed to be amended to reduce the record retention period from five years to three years for consistency with 40 CFR §144.51(j)(2)(ii). The language of §331.67(c) is also proposed to be amended for greater consistency with the corresponding federal requirement.

Section 331.68, Post-Closure Care, is proposed to be amended for consistency with 40 CFR §146.72(b)(5). Additional modifications are proposed to simplify the language and to delete a reference for consistency with *Texas Register* format requirements.

Subchapter E: Standards for Class III Wells

Section 331.82(a) and (c), Construction Requirements, is proposed to be amended to clarify existing commission rules on construction requirements for new and existing Class III wells, baseline wells, and monitor wells. In subsection (a), the acronym for underground sources of drinking water is proposed to be spelled out on its first usage in the section. The proposed amendments also implement an environmental protection requirement to prevent contamination of groundwater from wells not cemented

to the surface or from uncapped wells in areas where there is the potential for contamination of groundwater. Examples of areas where there is the potential for contamination or foreign matter to enter the groundwater through an inadequately cemented or uncapped well include crop lands where pesticides, herbicides, or fertilizers are used. Also, "monitoring" is proposed to be changed to "monitor" in subsections (g), (h), and (i) for greater consistency with the definition of "monitor well."

Subchapter F: Standards for Class III Well Production Area Development

Section 331.105, Monitoring Standards, is proposed to be amended to correct a punctuation error and update the "Texas Water Commission" reference to "commission."

Section 331.106(1), Remedial Action for Excursion, is proposed to be amended to update the name "district" office to "commission regional" office and to delete an obsolete specific address. This section is also proposed to be amended to improve grammar and to clarify the notice requirement.

Section 331.107, Restoration, is proposed to be amended to update the term "Texas Water Commission district office" to "commission regional office" in subsection (b). Also, subsection (e) is proposed to be amended to delete the unnecessary words.

Subchapter G: Consideration Prior to Permit Issuance

Section 331.121(a)(2), Class I Wells, is proposed to be amended to correct a cross-reference to §305.45(a)(8). Also, subsection (b), is proposed to be amended to correct a typographical error and to correct a cross reference to §281.21(d). Finally, subsection (f) is proposed to be amended to improve

the readability and to substitute the term "RCRA" for "Resource Conservation and Recovery Act" because the term is defined in Chapter 3 of the commission's rules.

Subchapter J: Standards for Class I Salt Cavern Solid Waste Disposal Wells

Section 331.161, Applicability, is proposed to be amended to correct the cross-reference to §331.14.

Section 331.163, Construction Standards, is proposed to be amended to correct cross-references. In addition, the section is proposed to be amended for clarification and to include provisions for photography and retention of full-hole, continuous cores. These provisions are necessary so that a permanent record of the cores will be maintained and made available for review by members of the public.

Section 331.164, Cavern Construction Standards, is proposed to be amended to correct a typographical error and a cross-reference to §331.45(2).

Section 331.165(a)(4), Waste Disposal Operating Requirements, is proposed to be amended to correct the cross-reference to §331.162.

Section 331.166, Monitoring and Testing Requirements, is proposed to be amended to correct punctuation errors and to ensure consistency with the defined term "monitor well."

Section 331.167, Reporting Requirements, is proposed to be amended to correct cross-references to §§331.45(2), 331.163, 331.164, and 331.166(h). The section is also proposed to be amended to correct grammatical and typographical errors.

Section 331.169, Record-Keeping Requirements, is proposed to be amended to change the five-year record retention period to three years. This amendment will make the requirement consistent with federal rules.

Section 331.171 is proposed to be amended to change the five-year record retention period to three years. This amendment will make the requirement consistent with federal rules.

Subchapter K: Additional Requirements for Class V Aquifer Storage Wells

Section 331.182(1), Area of Review, is proposed to be amended to change "TNRCC" to "commission" in two places in accordance with current regulatory reform initiative and to correct the agency name of the Railroad Commission of Texas.

Section 331.183, Construction and Closure Standards, is proposed to be amended to correct a punctuation error.

Concurrently, the commission proposes the review of 30 TAC Chapter 331, in accordance with Texas Government Code, §2001.039, and is publishing the proposed notice of review in the Rules Review section of this issue of the *Texas Register*.

FISCAL NOTE

Jeff Horvath, Technical Specialist with Strategic Planning and Appropriations, has determined that for the first five-year period the proposed amendments are in effect, there will be no significant fiscal implications for units of state and local government as a result of administration or enforcement of the proposed amendments to Chapter 331, Underground Injection Control. The proposed amendments are intended to make these rules easier to read and understand and do not add or make requirements more stringent than currently existing rules. In addition, the proposed amendments are intended to provide clarification to existing rules, to make rule requirements consistent with current practice, to make technical corrections to definitions, to correct typographical errors, and to make the rules consistent with federal regulations. In general, most changes involve editorial changes, reordering requirements into a new sequence, and correcting cross-references. Also, records retention requirements have been reduced from five years to three years to be consistent with federal requirements.

PUBLIC BENEFIT AND COSTS

Mr. Horvath has also determined that for each year of the first five years the proposed amendments to Chapter 331 are in effect, the public benefit anticipated from enforcement of and compliance with the proposed amendments will be reduced regulatory requirements, enhanced clarity in, and compliance with, general commission processes and enhanced understanding by making the rules consistent with current rule writing guidelines and federal requirements. These benefits are anticipated to assist the public and the regulated community in their understanding of and compliance with the regulations.

There are no economic costs anticipated to any person required to comply with the proposed amendments to Chapter 331 because the proposed amendments reduce regulatory requirements and the costs associated with complying with those requirements. In addition, the proposed amendments do not impose any new regulatory costs to comply with the proposed requirements. It is anticipated that the proposed reduction in records retention requirements will have a minor positive fiscal impact on current and future owners and operators of underground injection wells.

SMALL BUSINESS ANALYSIS AND MICRO-BUSINESS ANALYSES

No adverse economic effects are anticipated to any small businesses or micro-businesses as a result of implementing the proposed amendments because the proposed amendments reduce records retention requirements, make current rules consistent with federal requirements, and make current requirements easier to understand. It is anticipated that there will be minor cost savings as a result of reducing records retention requirements.

DRAFT REGULATORY IMPACT ANALYSIS

The commission has reviewed the proposed rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and has determined that the rulemaking is not subject to §2001.0225 because it does 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, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state. The proposed

amendments to Chapter 331 do not adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, or the public health and safety of the state or a sector of the state because the proposed amendments clarify or reduce current regulatory requirements. These changes are anticipated to have minor positive economic benefits to affected facilities and will have no negative impacts on the environment or public health and safety. The proposed amendments do not add any additional costs to comply with the proposed regulatory requirements. In addition, the proposed amendments are not a "major environmental rule" because they do not meet the applicability requirements listed in Texas Government Code, §2001.0225(a)(1)-(4). The proposed amendments do not exceed a standard set by federal law, exceed an express requirement of state law, nor exceed a requirement of a delegation agreement.

TAKINGS IMPACT ASSESSMENT

The commission has prepared a takings impact assessment for these rules pursuant to Texas Government Code, §2007.043. The following is a summary of that assessment. The purpose of the rulemaking is to update and clarify Chapter 331. This rulemaking also improves consistency with federal rules. The rule amendments reduce the record retention period from five years to three years for consistency with federal rules. Promulgation and enforcement of these rules will not burden private real property which is the subject of the rules because the proposed amendments update and clarify rule requirements.

Also, the Texas Government Code, exception at §2007.003(b) regarding an action reasonably taken to fulfill an obligation mandated by federal law applies to this rulemaking.

COASTAL MANAGEMENT PROGRAM CONSISTENCY REVIEW

The commission has reviewed the proposed rulemaking and found that the rule is not specifically identified in Coastal Coordination Act Implementation Rules, 31 TAC §505.11, nor will it affect any action/authorization identified in 31 TAC §505.11. Therefore, the proposal is not subject to the Texas Coastal Management Program (CMP).

The commission seeks public comment on the applicability of the CMP to the proposed rule amendments.

SUBMITTAL OF COMMENTS

Comments may be submitted to Angela Slupe, Office of Environmental Policy, Analysis, and Assessment, MC 205, P.O. Box 13087, Austin, Texas 78711-3087; or by fax at (512) 239-4808. All comments must be received by 5:00 p.m. on August 14, 2000 and should reference Rule Log No. 1999-025-331-WS. For further information, please contact David Williams at (512) 239-0339 or Devane Clarke at (512) 239-5604.

STATUTORY AUTHORITY

The amended sections are proposed under Texas Water Code (TWC), §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

SUBCHAPTER A: GENERAL PROVISIONS

§§331.1, 331.2, 331.3, 331.4, 331.11-331.13, 331.16

§331.1. Purpose, Scope and Applicability.

(a)-(b) (No change.)

(c) Exemptions from the prohibition of injection of hazardous waste authorized by 40 Code of Federal Regulations Part 148 are not within the scope of the commission's jurisdiction.

§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 [whose use] 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 or of pre-injection facilities, including the [and includes] processing, storage, and disposal of waste.

(3)-(6) (No change.)

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

(8) **Aquifer storage well** [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)-(14) (No change.)

(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 [calcium carbonate] ($CaCO_3$), anhydrite [anhydride] ($CaSO_4$), and accessory minerals. Caprocks often contain lost circulation zones characterized by rock layers of high porosity and permeability.

(16) (No Change.)

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

(18) [(17)] **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) [(18)] **Cementing** - The operation whereby cement is introduced into a wellbore and/or forced behind the casing.

(20) [(19)] **Commercial facility** - A Class I permitted facility, where one or more commercial wells are operated [permittee who operates one or more commercial injection wells].

(21) [(20)] **Commercial Underground Injection Control (UIC) [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, [for a charge,] except a captured facility or a facility that accepts waste only from other facilities owned or effectively controlled by the same person.

(22) [(21)] **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.

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

(24) **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.

(25) [(23)] **Confining zone** - A part of a formation, a formation, or group of formations between the injection zone and the lowermost USDW [Underground Source of Drinking Water (USDW)]or freshwater aquifer that acts as a barrier to the movement of fluids out of the injection zone.

[(24) Is 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 a USDW or freshwater aquifer.]

(26) [(25)] **Contaminant** - Any physical, biological, chemical or radiological substance or matter in water.

(27) [(26)] **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.

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

(29) [(28)] **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.

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

(31) [(30)] **Excursion** - The movement of mining solutions into a designated monitor well.

(32) [(31)] **Existing injection well** - A Class I well which was authorized by an approved state or EPA-administered program before August 25, 1988 [, by an approved state program, or an EPA-administered program] 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).

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

(34) [(33)] **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.

(35) [(34)] **Formation fluid** - Fluid present in a formation under natural conditions.

(36) [(35)] **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.

(37) [(36)] **Groundwater** - Water below the land surface in a zone of saturation.

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

[**(37) Hazardous industrial waste** - Any industrial solid waste or combination of industrial solid wastes identified or listed as a hazardous waste by the administrator of the United States Environmental Protection Agency pursuant to the Resource Conservation and Recovery Act of 1976, §3001. The administrator has identified the characteristics of hazardous wastes and listed certain wastes as hazardous in 40 of the Code of Federal Regulations, Part 261. The executive director will maintain in the offices of the commission a current list of hazardous wastes, a current set of characteristics of hazardous waste, and applicable appendices, as promulgated by the administrator.]

(39) [(38)] **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.

(40) [(39)] **Injection operations** - The surface storage or subsurface emplacement of fluids occurring in connection with an injection well or wells, other than that occurring solely for construction or initial testing.

(41) [(40)] **Injection well** - A well into which fluids are being injected.

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

(43) [(42)] **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.

(44) [(43)] **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.

(45) [(44)] **Liner** - An additional casing string typically set and cemented inside the long string casing and occasionally [. Occasionally,] used to extend from base of the long string casing to or through the injection zone.

(46) [(45)] **Long string casing or production casing** - A string of casing that is set inside the surface casing and that usually extends [extending] to or through the injection zone.

(47) [(46)] **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."

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

(49) [(48)] **Mine plan** - A map of proposed mine areas and an estimated schedule indicating the sequence and timetable for mining and any required aquifer restoration.

(50) [(49)] **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 surface facilities.

(51) [(50)] **New injection well** - Any well, or group of wells not an existing injection well.

(52) [(51)] **New waste stream** - A waste stream not permitted.

(53) [(52)] **Non-commercial facility** - A Class I permitted facility [permittee] which operates only non-commercial [noncommercial] wells.

(54) [(53)] **Non-commercial UIC Class I well facility** - A UIC Class I permitted facility where only non-commercial wells are operated [permittee which operates only non-commercial wells].

(55) [(54)] **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.

(56) [(55)] **Off-site** - Property which cannot be characterized as on-site.

(57) [(56)] **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.

(58) [(57)] **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.

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

(60) [(59)] **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.

(61) [(60)] **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.

(62) [(61)] **Pre-Injection facilities** - 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.

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

(64) [(63)] **Production area authorization** - A document, issued [by the Texas Water Commission] under the terms of an injection well permit, approving the initiation of mining activities in a specified production area within a permit area.

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

[(65) **Radioactive material** - A material which is identified as a radioactive material under Texas Civil Statutes, Article 4590f, or the rules adopted by the Texas Board of Health pursuant thereto.]

(66) **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 [A solid waste which is identified as a radioactive waste in and

requires special licensing under Texas Civil Statutes, Article 4590f, or the rules adopted by the Texas Board of Health pursuant thereto].

[(67) **RCRA** - The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Public Law 94-580, as amended by Public Law 95-609, Public Law 96-510, 42 USC 6901 et seq.).]

(67) [(68)] **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.

(68)[(69)] **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.

(69) [(70)] **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.

(70) [(71)] **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.

(71) [(72)] **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.

(72) [(73)] **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.

(73) [(74)] **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.

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

(75) [(76)] **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.

[(77) **SDWA** - The Safe Drinking Water Act (Public Law 93-523, as amended; 42 USC 300f et seq.).]

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

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

(78) [(80)] **Total dissolved solids (TDS)** - The total dissolved (filterable) solids as determined by use of the method specified in 40 CFR [Code of Federal Regulations] Part 136, as amended [136].

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

(80) [(82)] **Underground injection** - The subsurface emplacement of fluids through a well.

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

(82) [(84)] **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 [ground water] contains fewer than l0,000 mg/l total dissolved solids; and

(C) which is not an exempted aquifer.

(83) [(85)] **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.

(84) [(86)] **Verifying analysis** - A second sampling and analysis of control parameters for the purpose of confirming a routine sample analysis which [indicates] 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.

(85) [(87)] **Well** - A bored, drilled, or driven shaft, or an artificial opening in the ground made by digging, jetting, or some other method, where the depth of the opening is greater than its largest surface dimension, but [the term] does not include any surface pit, surface excavation, or natural depression.

(86) [(88)] **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.

(87) [(89)] **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 [and includes], but [is] not limited to surging, jetting, blasting, acidizing, and hydraulic fracturing.

(88) [(90)] **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.

§331.3. Injection Prohibited.

(a) Unless excluded under subsection (b) of this section, the construction of an injection well, the conversion of a well into an injection well, and the use or operation of an injection well is prohibited unless authorized by an injection well permit, order, or rule of the commission. A RCRA [Resource Conservation and Recovery Act of 1976 (RCRA)] permit applying the standards of Chapter 335, Subchapter F of this title (relating to Permitting Standards for Owners and Operators of Hazardous Waste Storage, Processing, or Disposal Facilities) [§335.152(14) of this title (relating to Permitting Standards of Owners and Operators of Hazardous Waste Storage Processing or Disposal Facilities)] will constitute an [a] underground injection control (UIC) permit for hazardous waste injection wells for which the technical standards of this chapter are not generally appropriate.

(b)-(c) (No change.)

§331.4. Mechanical Integrity Required.

Injection is prohibited for Class I and III wells which lack mechanical integrity, the result of which may pollute an underground source of drinking water. Except where excluded in the case of

authorization by rule, mechanical integrity under §331.43 of this title (relating to Mechanical Integrity Standards) must be demonstrated to the satisfaction of the executive director before operation begins. Injection may be prohibited for Class V wells which lack mechanical integrity. The executive director may require a demonstration of mechanical integrity at any time if there is reason to believe mechanical integrity is lacking. When the executive director determines that a Class I or III well lacks mechanical integrity, the executive director [he] shall give written notice of this [his] determination to the owner or operator. Unless the executive director requires immediate cessation, the owner or operator shall cease injection into the well within 48 hours of receipt of the executive director's determination. The executive director may allow plugging of the well or require the permittee to perform additional construction, operation, monitoring, reporting, and corrective actions which are necessary to prevent the movement of fluid into or between underground sources of drinking water [(USDWs)] caused by the lack of mechanical integrity. The owner or operator may resume injection upon written notification from the executive director that the owner or operator has demonstrated mechanical integrity.

§331.11. Classification of Injection Wells.

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

(1) (No change.)

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

(A)-(B) (No change.)

(3)-(4) (No change.)

(b) (No change.)

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

§331.12. Conversion of Wells.

(a) Persons utilizing wells authorized by permit, rule, or otherwise, who wish to convert the well from its authorized purpose to a new or additional purpose must first obtain the appropriate approval described in paragraphs (1)-(3) of this section:

(1) Persons utilizing injection wells authorized by permit must obtain either a permit amendment pursuant to §305.62 of this title (relating to Amendment), or if appropriate, a permit revocation pursuant to §305.66 of this title (relating to Permit Denial, Suspension, and Revocation [Revocation and Suspension]) or §305.67 of this title (relating to Revocation and Suspension Upon Request or Consent).

(2)-(3) (No change.)

(b) (No change.)

§331.13. Exempted Aquifer.

(a) (No change.)

(b) Except for injection authorized by rule, the commission may require a permit for injection into an exempted aquifer [in order] to protect fresh water outside the exempted aquifer which may be subject to pollution caused by the injection.

(c)-(f) (No change.)

§331.16. Memorandum of Understanding Between the Texas Department of Health and the Texas Natural Resource Conservation Commission Regarding Radiation Control Functions.

The Memorandum of Understanding between the Texas Department of Health and the Texas Natural Resource Conservation Commission Regarding Radiation Control Functions, effective November 30, 1998, is adopted by reference in §7.118 of this title (relating to Memorandum of Understanding between the Texas Department of Health and the Texas Natural Resource Conservation Commission Regarding Radiation Control Functions). However, the full text of the memorandum of understanding can be found only in Texas Department of Health rule 25 TAC §289.101 (relating to Memorandum of Understanding between the Texas Department of Health and the Texas Natural

Resource Conservation Commission Regarding Radiation Control Functions). If a copy of this document is required and cannot be obtained from the Internet, a copy can be requested from the Texas Natural Resource Conservation Commission, Chief Clerk's Office, P.O. Box 13087, Austin, Texas 78711-3087, (512) 239-3300.

SUBCHAPTER C: GENERAL STANDARDS AND METHODS

§§331.42, 331.44, 331.46

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

§331.42. Area of Review.

(a)-(b) (No change.)

(c) The computation of the cone of influence may be based upon the parameters listed in the figure in this subsection [below] and should be calculated for an injection time period equal to the expected life of the injection well or pattern. The following modified Theis equation illustrates one form which the mathematical model may take: [.]

Figure: 30 TAC §331.42(c) (No change.)

$r = (2.25 KHht / S10^{x})^{½}$

Where

$x = 4\pi KH (h_w - h_{bo} x S_pG_b) / 2.3 Q$

r = radius of endangering influence from injection well (length)

K = hydraulic conductivity of the injection zone (length/time)

H = thickness of the injection zone (length)

t = time of injection (time)

S = storage coefficient (dimensionless)

Q = injection rate (volume/time)

h_{bo} = observed original hydrostatic head of injection zone (length) measured from the base of the lowermost underground source of drinking water

h_w = hydrostatic head of underground source of drinking water (length) measured from the base of the lowest underground source of drinking water

S_pG_b = specific gravity of fluid in the injection zone (dimensionless)

π = 3.142 (dimensionless)

The above equation is based on the following assumptions:

(1) the injection zone is homogenous and isotropic;

(2) the injection zone has infinite area extent;

(3) the injection well penetrates the entire thickness of the injection zone;

(4) the well diameter is infinitesimal compared to "r" when injection time is longer than a few minutes; and

(5) the emplacement of fluid into the injection zone creates instantaneous increase in pressure.

(d)-(e) (No change.)

§331.44. Corrective Action Standards.

(a) Corrective action standards for all wells. In determining the adequacy of corrective action proposed or required to prevent or correct pollution of underground sources of drinking waters (USDWs), and fresh or surface water, the following factors shall be considered:

(1)-(11) (No change.)

(b) Additional corrective action standards for Class I wells.

(1) (No change.)

(2) The criteria of subsection (a) of this section [§331.44(a) of this title (relating to Corrective Action Standards)] will be used to determine adequacy.

(3)-(7) (No change.)

§331.46. Closure Standards.

(a) (No change.)

(b) For all Class I wells, including salt cavern disposal wells, prior to well closure, appropriate mechanical integrity testing shall be conducted to ensure the integrity of that portion of the long string casing and cement that will be left in the ground after closure. Testing methods may include:

(1)-(4) (No change.)

(c)-(p) (No change.)

SUBCHAPTER D: STANDARDS FOR CLASS I WELLS OTHER THAN SALT CAVERN SOLID WASTE DISPOSAL WELLS

§§331.62, 331.66-331.68

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

§331.62. Construction Standards.

All Class I wells shall be designed, constructed, and completed to prevent the movement of fluids that could result in the pollution of an underground source of drinking water (USDW).

(1) Design criteria. 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. The well shall be designed and constructed to prevent potential leaks from the well, to prevent the

movement of fluids along the wellbore into or between USDWs [Underground Source of Drinking Waters (USDWs)], to prevent the movement of fluids along the wellbore out of the injection zone, to permit the use of appropriate testing devices and workover tools, and to permit continuous monitoring of injection tubing, long string casing and annulus, as required by this chapter. All well materials must be compatible with 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, the American Society for Testing Materials, or comparable standards acceptable to the executive director.

(A)-(B) (No change.)

(2)-(10) (No change.)

§331.66. Additional Requirements and Conditions.

(a) A permit for a Class I well shall include expressly or by reference the following conditions.

(1)-(3) (No change.)

(4) The commission may prescribe additional requirements for Class I wells [in order] to protect USDWs, and fresh or surface water from pollution.

(b) (No change.)

§331.67. Recordkeeping Requirements.

(a)-(b) (No change.)

(c) The permittee shall retain, for a period of three [five] years following the completion of any plugging and abandonment procedures, records of all monitoring information including the nature and composition of all injected fluids [information resulting from any monitoring activities, including the chemical and physical characteristics of injected fluids] or other records required by the permit. The executive director may require a permittee to submit copies of the records at any time prior to conclusion of the retention period.

§331.68 Post-Closure Care.

(a) (No change.)

(b) The owner or operator shall:

(1) continue and complete any corrective action required under §331.44 of this title [(relating to Corrective Action Standards)];

(2)-(4) (No change.)

(5) Retain, for a period of three [five] years following well closure [plugging and abandonment], records reflecting the nature, composition, and volume of all injected fluids. The [executive director shall require the] owner or operator must [to] deliver the records to the executive director at the conclusion of the retention period, and the [all] records shall thereafter be retained at a location designated by the executive director for that purpose.

SUBCHAPTER E: STANDARDS FOR CLASS III WELLS

§331.82

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

§331.82. Construction Requirements.

(a) Casing and cementing. All new Class III wells, baseline wells, and monitor wells associated with the mining operations shall be cased, cemented to the surface, and capped [and cemented] to prevent the migration of fluids which may cause the pollution of underground sources of drinking water (USDWs) and maintained in that condition throughout the life of the well. In addition, existing wells in areas where there is the potential for contamination and other harmful or foreign matter to enter groundwater through an open well, shall also be cemented to the surface and capped [USDWs]. The casing and cement used in the construction of each [newly drilled] well shall be

designed for the life expectancy of the well. In determining and specifying casing and cementing requirements, the following factors shall be considered:

(1)-(7) (No change.)

(b) (No change.)

(c) Logs and tests. Appropriate logs and other tests shall be conducted during the drilling and construction of all new Class III wells and after an existing well has been repaired. A descriptive report interpreting the results of those logs and tests shall be prepared by a knowledgeable log analyst and submitted to the executive director. The logs and tests appropriate to each type of Class III well shall be determined based on the intended function, depth, construction, and other characteristics of the well, availability of similar data in the area of the drilling site, and the need for additional information that may arise from time to time as the construction of the well progresses.

(1)-(3) (No change.)

(d)-(f) (No change.)

(g) Monitor well location. Where injection is into a formation which contains water with less than 10,000 mg/l TDS, monitor [monitoring] wells shall be completed into the injection zone and into any USDW above the injection zone which could be affected by the mining operation. These wells

shall be located to detect any excursion of injection fluids, production fluids, process by-products, or formation fluids outside the mining area or zone. If the operation may be affected by subsidence or catastrophic collapse, the monitor [monitoring] wells shall be located so that they will not be physically affected. Designated monitor [monitoring] wells shall be installed at least 100 feet inside any permit area boundary, unless excepted by written authorization from the commission.

(h) Subsidence or catastrophic collapse. Where the injection wells penetrate a USDW in an area subject to subsidence or catastrophic collapse an adequate number of monitor [monitoring] wells shall be completed into the USDW to detect any movement of injected fluids, process by-products or formation fluids into the USDW. The monitor [monitoring] wells shall be located outside the physical influence of the subsidence or catastrophic collapse.

(i) Monitor well criteria. In determining the number, location, construction, and frequency of monitoring of the monitor [monitoring] wells the following criteria shall be considered:

(1)-(6) (No change.)

SUBCHAPTER F: STANDARDS FOR CLASS III WELL

PRODUCTION AREA DEVELOPMENT

§§331.105-331.107

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

§331.105. Monitoring Standards.

The following shall be accomplished to detect mining solutions in designated monitor wells: [.]

(1) Routine sampling. Water samples shall be taken at least twice a month at two-week intervals from all monitor wells for permit/production area(s) in which mining solutions have been introduced. These shall be analyzed for the control parameters by the second working day and reported as required in §331.85(e) of this title (relating to Reporting Requirements). The determined values

shall be entered on appropriate forms within three working days after analysis. These data shall be kept readily available on site for review by commission [Texas Water Commission] representatives.

(2)-(4) (No change.)

§331.106. Remedial Action for Excursion.

If the verifying analysis indicates that mining solutions are present in a designated monitor well, the operator shall take the following actions:

(1) notification - notify the commission regional [district] office by the next working day by telephone and notify the executive director by letter postmarked within 48 hours of identification of the excursion. [identifying the] The notification must identify the affected monitor well and [submitting] the control parameter concentrations. [This letter shall be addressed to the executive director in care of the Director, Hazardous and Solid Waste Division.]

(2) (No change.)

§331.107. Restoration.

(a) (No change.)

(b) Mining completion. When the mining of a permit or production area is completed, the permittee shall notify the appropriate commission regional [Texas Water Commission district] office and the executive director and shall proceed to reestablish groundwater quality in the affected permit or mine area aquifers to levels consistent with the values listed in the restoration table for that permit or mine area. Restoration efforts shall begin as soon as practicable but no later than 30 days after mining is completed in a particular production area. The executive director, subject to commission approval, may grant a variance from the 30-day period for good cause shown.

(c)-(d) (No change.)

(e) Stability sampling. The permittee shall obtain stability samples and complete an analysis for certain parameters listed in the restoration table from all production area baseline wells. Stability samples shall be conducted at a minimum of 30-day intervals for a minimum of three sample sets and reported to the executive director. The permittee shall notify the executive director at least two weeks in advance of sample dates [in order] to provide the opportunity for splitting samples and for selecting additional wells for sampling, if desired. To insure water quality has stabilized, a period of 180 days must elapse between cessation of restoration operations and the final set of stability samples. The executive director shall determine within 45 days of the receipt of all sample analysis results whether or not restoration has been achieved. Upon acknowledgment in writing by the executive director confirming achievement of final restoration, the permittee shall accomplish closure of the area in accordance with §331.86 of this title (relating to Closure).

(f) (No change.)

SUBCHAPTER G: CONSIDERATION PRIOR TO PERMIT ISSUANCE

§331.121

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

§331.121. Class I Wells.

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

(1) (No change.)

(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)

[conformance with Chapter 305 of this title (relating to Consolidated Permits)] including, but not limited to:

(A)-(P) (No change.)

(3)-(5) (No change.)

(b) In determining whether the use or installation of an injection well for the disposal of hazardous waste 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) [§281.21 of this title (relating to Draft Permit and Compliance Summary)];

(2)-(4) (No change.)

(c)-(e) (No change.)

(f) Interim Status under the RCRA [Resource Conservation and Recovery Act (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 [to that well] 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) (No change.)

SUBCHAPTER J: STANDARDS FOR CLASS I SALT CAVERN

SOLID WASTE DISPOSAL WELLS

§§331.161, 331.163-331.167, 331.169, 331.171

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement Texas Water Chapter 27, Injection Wells.

§331.161. Applicability.

The sections of this subchapter apply to all Class I salt cavern solid waste disposal wells and their associated salt caverns located in the salt stocks of salt domes, and not to such facilities in horizontally bedded or non-domal salt. As provided by §331.14 of this title (relating to Prohibition of Class I Salt Cavern Solid Waste Disposal Wells and Associated Caverns in Geologic Structures or Formations Other Than Salt Stocks of Salt Domes) [(relating to Prohibition of Class I Salt Cavern Solid Waste Disposal Wells and Associated Caverns in Horizontally Bedded or Non-domal Salt)], salt cavern solid waste disposal wells and associated caverns in horizontally bedded or non-domal salt are

prohibited until such time at which §331.14 of this title [(relating to Prohibition of Class I Salt Cavern Solid Waste Disposal Wells and Associated Caverns in Geologic Structures or Formations Other Than Salt Stocks of Salt Domes)] and this subchapter are amended to allow the subject facilities, and any necessary specific rules for such facilities in horizontally bedded or non-domal salt are added by amendment to this subchapter or promulgated as a new subchapter.

§331.163. Well Construction Standards.

(a)-(d) (No change.)

(e) Logs and tests.

(1)-(2) (No change.)

(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)-(D) (No change.)

(4) (No change.)

(f)-(h) (No change.)

(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 pursuant to 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(1) of this title (relating to Executive Director Approval of Construction and Completion);

(2)-(3) (No change.)

§331.164. Cavern Construction Standards.

(a) (No change.)

(b) Standards for cavern construction by controlled dissolutioning. The creation of waste storage or disposal caverns within the salt shall be accomplished by the controlled dissolution of the sidewalls of the well bore to a specified maximum diameter, between selected elevations specified in the permit as the top and bottom of the salt cavern injection interval. The top of the cavern shall be at least 100 feet below the base of the long string casing. The enlargement of a portion of the original well bore to serve as the cavern shall be done according to the cavern construction plans which shall be submitted as a part of the permit application. The cavern construction plans shall demonstrate at a minimum, the following:

(1)-(6) (No change.)

(7) all cavern solutioning brines shall be disposed of in facilities authorized by the commission for such purpose.

(c)-(e) (No change.)

(f) Reports and approval.

(1) (No change.)

(2) Approval of completion of the cavern construction stage. Within 90 days of completion of cavern construction, including configuration of the well for waste disposal, and prior to beginning waste emplacement, the permittee shall obtain written approval from the executive director which states that the cavern construction is in compliance with the applicable provisions of the permit. To obtain approval, the permittee shall submit to the executive director the following reports and certifications prepared and sealed by a professional engineer with current registration pursuant to the Texas Engineering Practice Act:

(A) final construction, "as-built" plans and specifications, injection and confining zone data, and an evaluation of the considerations under [set out in] §331.45(2) of this title (relating to Executive Director Approval of Construction and Completion);

(B)-(D) (No change.)

§331.165. Waste Disposal Operating Requirements.

(a) General operating requirements.

(1)-(3) (No change.)

(4) Chemical and physical characteristics of all injected materials and cavern contents, including[,] but not limited to, bulk density and compressive strength of solidified waste, shall protect and be compatible with the injection well, associated facilities, and injection zone, and shall ensure proper operation of the facility to meet the performance standard of §331.162 of this title (relating to Performance Standard [Standards]). In addition, after cavern construction is certified and a cavern is authorized to receive wastes under §331.164(f) of this title (relating to Cavern Construction Standards), all injected materials and cavern contents shall not cause further dissolution of the cavern walls.

(5)-(15) (No change.)

(b)-(c) (No change.)

§331.166. Monitoring and Testing Requirements.

(a) Waste analysis plan. All material injected into or produced from the cavern shall be sampled and analyzed in accordance with the approved written waste analysis plan required by 40 Code of Federal Regulations §146.68(a).

(b)-(c) (No change.)

(d) Testing and calibration of monitoring instruments. All gauges, and pressure sensing and recording devices shall be tested and calibrated quarterly.

(e) Well mechanical integrity. The owner or operator shall maintain mechanical integrity of the injection well at all times that the well is in service. Mechanical integrity of the well must be demonstrated:

(1)-(2) (No change.)

(3) a casing inspection, casing evaluation, or other approved log may be required by the executive director to determine the condition of the casing.

(f)-(g) (No change.)

(h) Ambient monitoring.

(1)-(2) (No change.)

(3) Any monitor [monitoring] wells within the area of review selected for the observation of water quality, subsidence, formation pressure, or any other parameter, shall be monitored at an accuracy, frequency, and density sufficient to protect underground sources of drinking water, and fresh or surface water.

(i)-(k) (No change.)

§331.167. Reporting Requirements.

(a) Pre-operation reports.

(1) Well completion report. Within 90 days after the completion of the well, the permittee shall submit a Well Completion Report to the executive director addressing the considerations and standards in §331.45(2) of this title (relating to Executive Director Approval of Construction and Completion) and §331.163 of this title (relating to Well Construction Standards), and including a completed copy of the commission's Well Data Form, and a surveyor's plat showing the exact location and giving the latitude and longitude of the well. The report will also include a certification that a notation on the deed to the facility property or on some other instrument which is normally examined during title search has been made stating the surveyed location of the well, and the well permit number. The permittee shall integrate the data obtained into adjusted injection zone fluid transport calculations, and updated cross-sections of the injection zone, and shall include these items in the completion report.

(2) Cavern completion report. Within 90 days after the completion of the cavern, the permittee shall submit a Cavern Completion Report to the executive director addressing the considerations and standards in §331.45(2) of this title [(relating to Approval of Construction and Completion)] and §331.164 of this title (relating to Cavern Construction Standards), and including a surveyor's plat showing the exact location and giving the latitude and longitude of the cavern. The report will also include a certification that a notation on the deed to the facility property or on some other instrument which is normally examined during title search has been made stating the surveyed location of the cavern, the well permit number, the depth of the cavern floor and ceiling, the cavern

diameter, the dates of operation, and its permitted waste streams. The permittee shall integrate the data obtained into adjusted injection zone waste transport calculations, waste front calculations and updated cross-sections of the injection zone and include these items in the completion report.

(3)-(4) (No change.)

(5) Approval of construction and completion. Prior to beginning operations, the permittee shall obtain written approval from the executive director which states that the constructions and completions of the well and cavern are in compliance with the applicable provisions of the salt cavern solid waste disposal well permit. To obtain certification, the permittee shall submit to the executive director the following reports and certifications prepared and sealed by a professional engineer with current registration pursuant to the Texas Engineering Practice Act:

(A) 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 Approval of Construction and Completion)];

(B)-(C) (No change.)

(b) Operating reports.

(1)-(2) (No change.)

(3) Injection zone annual report. For all facilities, the permittee shall submit annually with the December report of injection operation an updated graphic or other acceptable report and description of the effects of the well and cavern on the area of review, including a report on monitoring required by §331.166(h) of this title (relating to Monitoring and Testing Requirements) [as required by §331.145(i) of this title (relating to Monitoring Requirements)]. To the extent such information is reasonably available the report shall also include:

(A)-(C) (No change.)

(4)-(6) (No change.)

§331.169. Record-Keeping Requirements.

(a)-(b) (No change.)

(c) The permittee shall retain on location, for a period of three [five] years following abandonment, records of all information resulting from any monitoring activities, including the chemical and physical characteristics of injected waste, or other records required by the permit. The executive director may require a permittee to submit copies of the records at any time prior to conclusion of the retention period.

§331.171. Post-Closure Care.

(a) (No change.)

(b) The owner or operator shall:

(1)-(4) (No change.)

(5) Retain for a period of three [five] years following well closure records reflecting the nature, composition, and volume of all injected materials. The executive director shall require the owner or operator to deliver the records to the executive director at the conclusion of the retention period, and all records shall thereafter be retained at a location designated by the executive director for that purpose.

SUBCHAPTER K: ADDITIONAL REQUIREMENTS FOR CLASS V AQUIFER STORAGE WELLS

§§331.182-331.183

STATUTORY AUTHORITY

The amended sections are proposed under TWC, §5.103, which provides the commission 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 proposed amended sections implement TWC, Chapter 27, Injection Wells.

§331.182. Area of Review.

The area of review for a Phase I Class V aquifer storage well is the area determined by a radius of 1/4 mile from the proposed or existing wellbore. The area of review for a Phase II Class V aquifer storage well is the area determined by a radius of 1/4 mile from the perimeter of a buffer zone as described under §295.22(e)(5) of this title (relating to Additional Requirements for the Underground Storage of Surface Water for Subsequent Retrieval and Beneficial Use). In the application for

authorization, the applicant shall provide information on the activities within the area of review including the following factors and their adverse impacts, if any, on the injection operation:

(1) location of all artificial penetrations that penetrate the interval to be used for aquifer storage, including but not limited to: water wells and abandoned water wells from commission [TNRCC] well files or ground water district files; oil and gas wells and saltwater injection wells from the Railroad Commission of Texas [commission] files; and waste disposal wells/other injection wells from the commission [TNRCC] disposal well files;

(2)-(3) (No change.)

§331.183. Construction and Closure Standards.

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

(1)-(3) (No change.)