TITLE 16 ECONOMIC REGULATION
PART 1 RAILROAD COMMISSION OF TEXAS
CHAPTER 5 CARBON DIOXIDE (CO_2)

SUBCHAPTER A GENERAL PROVISIONS

§5.101 Purpose

The purpose of this chapter is to implement the state program for geologic storage of anthropogenic CO_2 consistent with state and federal law related to protection of underground sources of drinking water.
Source Note: The provisions of this §5.101 adopted to be effective December 20, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

§5.102 Definitions

The following terms, when used in Subchapter B of this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Affected person--A person who, as a result of activity sought to be permitted has suffered or may suffer actual injury or economic damage other than as a member of the general public.

(2) Anthropogenic carbon dioxide (CO_2)--

(A) CO_2 that would otherwise have been released into the atmosphere that has been:

(i) separated from any other fluid stream; or

(ii) captured from an emissions source, including:

(I) an advanced clean energy project as defined by Health and Safety Code, §382.003, or another type of electric generation facility; or

(II) an industrial source of emissions; and

(iii) any incidental associated substance derived from the source material for, or from the process of capturing, CO_2 described by clause (i) of this subparagraph; and

(iv) any substance added to CO_2 described by clause (i) of this subparagraph to enable or improve the process of injecting the CO_2; and

(B) does not include naturally occurring CO_2 that is produced, acquired, recaptured, recycled, and reinjected as part of enhanced recovery operations.

(3) Anthropogenic CO_2 injection well--An injection well used to inject or transmit anthropogenic CO_2 into a reservoir.

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

(5) Area of review (AOR)--The subsurface three-dimensional extent of the CO_2 stream plume and the associated pressure front, as well as the overlying formations, any underground sources of drinking water overlying an injection zone along with any intervening formations, and the surface area above that delineated region.

(6) Carbon dioxide (CO_2) plume--The underground extent, in three dimensions, of an injected CO_2 stream.

(7) Carbon dioxide (CO_2) stream-- CO_2 that has been captured from an emission source, incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process. The term does not include any CO_2 stream that meets the definition of a hazardous waste under 40 CFR Part 261.

(8) Casing--A pipe or tubing of appropriate material, of varying diameter and weight, lowered into a borehole during or after drilling in order to support the sides of the hole and thus prevent the walls from caving, to prevent loss of drilling mud into porous ground, or to prevent water, gas, or other fluid from entering or leaving the hole.

(9) Cementing--The operation whereby a cement slurry is pumped into a drilled hole and/or forced behind the casing.

(10) Class VI well--Any well used to inject anthropogenic CO_2 specifically for the purpose of the long-term containment of a gaseous, liquid, or supercritical CO_2 in subsurface geologic formations.

(11) Code of Federal Regulations (CFR)--The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.

(12) Commission--A quorum of the members of the Railroad Commission of Texas convening as a body in open meeting.

(13) Confining zone--A geologic formation, group of formations, or part of a formation stratigraphically overlying the injection zone or zones that acts as barrier to fluid movement. For Class VI wells operating under an injection depth waiver, confining zone means a geologic formation, group of formations, or part of a formation stratigraphically overlying and underlying the injection zone or zones that acts as a barrier to fluid movement.

(14) Corrective action--Methods to assure that wells within the area of review do not serve as conduits for the movement of fluids into or between underground sources of drinking water, including the use of corrosion resistant materials, where appropriate.

(15) Delegate--The person authorized by the director to take action on behalf of the Railroad Commission of Texas under this chapter.

(16) Director--The director of the Oil and Gas Division of the Railroad Commission of Texas or the director's delegate.

(17) Division--The Oil and Gas Division of the Railroad Commission of Texas.

(18) Draft permit--A document prepared indicating the director's tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. A notice of intent to terminate a permit, and a notice of intent to deny a permit are types of "draft permits." A denial of a request for modification, revocation and reissuance, or termination is not a draft permit.

(19) Enhanced recovery operation--Using any process to displace hydrocarbons from a reservoir other than by primary recovery, including using any physical, chemical, thermal, or biological process and any co-production project. This term does not include pressure maintenance or disposal projects.

(20) Exempted aquifer--An aquifer or its portion that meets the criteria in the definition of underground source of drinking water but which has been exempted according to the procedures in 40 CFR §144.7.

(21) Facility closure--The point at which the operator of a geologic storage facility is released from post-injection storage facility care responsibilities.

(22) Flow rate--The volume per time unit given to the flow of gases or other fluid substance which emerges from an orifice, pump, turbine or passes along a conduit or channel.

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

(24) Formation--A body of consolidated or unconsolidated 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.

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

(26) Fracture pressure--The pressure that, if applied to a subsurface formation, would cause that formation to physically fracture.

(27) Geologic storage--The long-term containment of anthropogenic CO_2 in subsurface geologic formations.

(28) Geologic storage facility or storage facility--The underground geologic formation, underground equipment, injection wells, and surface buildings and equipment used or to be used for the geologic storage of anthropogenic CO_2 and all surface and subsurface rights and appurtenances necessary to the operation of a facility for the geologic storage of anthropogenic CO_2. The term includes the subsurface three-dimensional extent of the CO_2 plume, associated area of elevated pressure, and displaced fluids, as well as the surface area above that delineated region, and any reasonable and necessary areal buffer and subsurface monitoring zones. The term does not include a pipeline used to transport CO_2 from the facility at which the CO_2 is captured to the geologic storage facility. The storage of CO_2 incidental to or as part of enhanced recovery operations does not in itself automatically render a facility a geologic storage facility.

(29) Good faith claim--A factually supported claim based on a recognized legal theory to a continuing possessory right in pore space, such as evidence of a currently valid lease or a recorded deed conveying a fee interest in the pore space.

(30) Injection zone--A geologic formation, group of formations, or part of a formation that is of sufficient areal extent, thickness, porosity, and permeability to receive CO_2 through a well or wells associated with a geologic storage facility.

(31) Injection well--A well into which fluids are injected.

(32) Interested person--Any person who expresses an interest in an application, permit, or Class VI UIC well.

(33) Limited English-speaking household--A household in which all members 14 years and older have at least some difficulty with English.

(34) Lithology--The description of rocks on the basis of their physical and chemical characteristics.

(35) Mechanical integrity--

(A) An anthropogenic CO_2 injection well has mechanical integrity if:

(i) there is no significant leak in the casing, tubing, or packer; and

(ii) there is no significant fluid movement into a stratum containing an underground source of drinking water through channels adjacent to the injection well bore as a result of operation of the injection well.

(B) The Commission will consider any deviations during testing that cannot be explained by the margin of error for the test used to determine mechanical integrity, or other factors, such as temperature fluctuations, to be an indication of the possibility of a significant leak and/or the possibility of significant fluid movement into a stratum containing an underground source of drinking water through channels adjacent to the injection wellbore.

(36) Monitoring well--A well either completed or re-completed to observe subsurface phenomena, including the presence of anthropogenic CO_2, pressure fluctuations, fluid levels and flow, temperature, and/or in situ water chemistry.

(37) Offshore--The area in the Gulf of Mexico seaward of the coast that is within three marine leagues of the coast.

(38) Operator--A person, acting for itself or as an agent for others, designated to the Railroad Commission of Texas as the person with responsibility for complying with the rules and regulations regarding the permitting, physical operation, closure, and post-closure care of a geologic storage facility, or such person's authorized representative.

(39) Packer--A device lowered into a well to produce a fluid-tight seal.

(40) Permit--An authorization, license, or equivalent control document issued by the Commission to implement the requirements of this chapter.

(41) Person--A natural person, corporation, organization, government, governmental subdivision or agency, business trust, estate, trust, partnership, association, or any other legal entity.

(42) 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.

(43) Post-injection facility care--Monitoring and other actions (including corrective action) needed following cessation of injection to assure that underground sources of drinking water are not endangered and that the anthropogenic CO_2 remains confined to the permitted injection interval.

(44) Pressure front--The zone of elevated pressure that is created by the injection of the CO_2 stream into the subsurface where there is a pressure differential sufficient to cause movement of the CO_2 stream or formation fluids from the injection zone into an underground source of drinking water.

(45) Reservoir--A natural or artificially created subsurface stratum, formation, aquifer, cavity, void, or coal seam.

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

(47) Surface casing--The first string of well casing to be installed in the well.

(48) Transmissive fault or fracture--A fault or fracture that has sufficient permeability and vertical extent to allow fluids to move beyond the confining zone.

(49) Underground source of drinking water (USDW)--An aquifer or its portion which is not an exempt aquifer as defined in 40 CFR §146.4 and which:

(A) supplies any public water system; or

(B) contains a sufficient quantity of ground water to supply a public water system; and

(i) currently supplies drinking water for human consumption; or

(ii) contains fewer than 10,000 mg/l total dissolved solids.

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

(51) Well stimulation--Any of 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 fluid to move more readily into the formation including, but not limited to, surging, jetting, blasting, acidizing, and hydraulic fracturing.

(52) Workover--An operation in which a down-hole component of a well is repaired or the engineering design of the well is changed. 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.

Source Note: The provisions of this §5.102 adopted to be effective December 20, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

SUBCHAPTER B GEOLOGIC STORAGE AND ASSOCIATED INJECTION OF ANTHROPOGENIC CARBON DIOXIDE (CO_2)

§5.201 Applicability and Compliance

(a) Scope of jurisdiction. This subchapter applies to the geologic storage and associated injection of anthropogenic CO_2 in this state, both onshore and offshore.

(b) Injection of CO_2 for enhanced recovery.

(1) This subchapter does not apply to the injection of fluid through the use of an injection well regulated under §3.46 of this title (relating to Fluid Injection into Productive Reservoirs) for the primary purpose of enhanced recovery operations from which there is reasonable expectation of more than insignificant future production volumes of oil, gas, or geothermal energy and operating pressures are no higher than reasonably necessary to produce such volumes or rates. However, the operator of an enhanced recovery project may propose to also permit the enhanced recovery project as a CO_2 geologic storage facility simultaneously.

(2) If the director determines that an injection well that is permitted for the injection of CO_2 for the purpose of enhanced recovery regulated under §3.46 of this title should be regulated under this subchapter because the injection well is no longer being used for the primary purpose of enhanced recovery operations or there is an increased risk to USDWs, the director must notify the operator of such determination and allow the operator at least 30 days to respond to the determination and to file an application under this subchapter or cease operation of the well. In determining if there is an increased risk to USDWs, the director shall consider the following factors:

(A) increase in reservoir pressure within the injection zone;

(B) increase in CO_2 injection rates;

(C) decrease in reservoir production rates;

(D) distance between the injection zone and USDWs;

(E) suitability of the enhanced oil or gas recovery AOR delineation;

(F) quality of abandoned well plugs within the AOR;

(G) the storage operator's plan for recovery of CO_2 at the cessation of injection;

(H) the source and properties of injected CO_2 ; and

(I) any additional site-specific factors as determined by the director.

(3) This subchapter does not preclude an enhanced oil recovery project operator from opting into a regulatory program that provides carbon credit for anthropogenic CO2 sequestered through the enhanced recovery project.

(c) Injection of acid gas. This subchapter does not apply to the disposal of acid gas generated from oil and gas activities from leases, units, fields, or a gas processing facility. Injection of acid gas that contains CO_2 and that was generated as part of oil and gas processing may continue to be permitted as a Class II injection well. The potential need to transition a well from Class II to Class VI shall be based on the increased risk to USDWs related to significant storage of CO_2 in the reservoir, where the regulatory tools of the Class II program cannot successfully manage the risk. In determining if there is an increased risk to USDWs, the director shall consider the following factors:

(1) the reservoir pressure within the injection zone;

(2) the quantity of acid gas being disposed of;

(3) the distance between the injection zone and USDWs;

(4) the suitability of the disposed waste AOR delineation;

(5) the quality of abandoned well plugs within the AOR;

(6) the source and properties of injected acid gas; and

(7) any additional site-specific factors as determined by the director.

(d) This subchapter applies to a well that is authorized as or converted to an anthropogenic CO_2 injection well for geologic storage (a Class VI injection well). This subchapter applies regardless of whether the well was initially completed for the purpose of injection and geologic storage of anthropogenic CO_2 or was initially completed for another purpose and is converted to the purpose of injection and geologic storage of anthropogenic CO_2, except that the Commission may not issue a permit under this subchapter for the conversion of a previously plugged and abandoned Class I injection well, including any associated waste plume, to a Class VI injection well.

(e) Expansion of aquifer exemption. The areal extent of an aquifer exemption for a Class II enhanced recovery well may be expanded for the exclusive purpose of Class VI injection for geologic storage if the aquifer does not currently serve as a source of drinking water; and the total dissolved solids content is more than 3,000 milligrams per liter (mg/l) and less than 10,000 mg/l; and it is not reasonably expected to supply a public water system in accordance with 40 CFR §146.4. An operator seeking such an expansion shall submit, concurrent with the permit application, a supplemental report that complies with 40 CFR §144.7(d). The Commission adopts 40 CFR §144.7 and §146.4 by reference, effective September 20, 2022.

(f) Injection depth waiver. An operator may seek a waiver from the Class VI injection depth requirements for geologic storage to allow injection into non-USDW formations while ensuring that USDWs above and below the injection zone are protected from endangerment. An operator seeking a waiver of the requirement to inject below the lowermost USDW shall submit, concurrent with the permit application or a permit amendment application, a supplemental report that complies with 40 CFR §146.95. The Commission adopts 40 CFR §146.95 by reference, effective September 20, 2022.

(g) This subchapter does not apply to the injection of any CO_2 stream that meets the definition of a hazardous waste under 40 CFR Part 261.

(h) If a provision of this subchapter conflicts with any provision or term of a Commission order or permit, the provision of such order or permit controls.

(i) The operator of a geologic storage facility must comply with the requirements of this subchapter as well as with all other applicable Commission rules and orders, including the requirements of Chapter 8 of this title (relating to Pipeline Safety Regulations) for pipelines and associated facilities.

Source Note: The provisions of this §5.201 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

§5.202 Permit Required, and Draft Permit and Fact Sheet

(a) Permit required.

(1) A person shall not begin drilling or operating an anthropogenic CO_2 injection well for geologic storage regulated under this subchapter or constructing or operating a geologic storage facility regulated under this subchapter without first obtaining the necessary permits from the Commission. Following receipt of a geologic storage facility permit issued under this subchapter, the storage operator shall obtain a permit to drill, deepen, or convert a well for storage purposes in accordance with §3.5 of this title (relating to Application to Drill, Deepen, Reenter, or Plug Back).

(2) A person may not begin injection until:

(A) construction of the well is complete;

(B) the operator has submitted to the director notice of completion of construction;

(C) the Commission has inspected or otherwise reviewed the injection well and finds it is in compliance with the conditions of the permit; and

(D) the director has issued a permit to operate the injection well.

(b) Permit amendment.

(1) An operator must file an application to amend an existing geologic storage facility permit with the director:

(A) prior to expanding the areal extent of the storage reservoir;

(B) prior to increasing the permitted injection pressure or injection rate;

(C) prior to adding injection wells; or

(D) at any time that conditions at the geologic storage facility materially deviate from the conditions specified in the permit or permit application.

(2) Compliance with plan amendments required by this subchapter does not necessarily constitute a material deviation in conditions requiring an amendment of the permit.

(c) Permit transfer. An operator may transfer its geologic storage facility permit to another operator if the requirements of this subsection are met. A new operator shall not assume operation of the geologic storage facility without a valid permit.

(1) Notice. An applicant must submit written notice of an intended permit transfer to the director at least 45 days prior to the date the transfer of operations is proposed to take place, unless such action could trigger U. S. Securities and Exchange Commission fiduciary and insider trading restrictions and/or rules.

(A) The applicant's notice to the director must contain:

(i) the name and address of the person to whom the geologic storage facility will be sold, assigned, transferred, leased, conveyed, exchanged, or otherwise disposed;

(ii) the name and location of the geologic storage facility and a legal description of the land upon which the storage facility is situated;

(iii) the date that the sale, assignment, transfer, lease conveyance, exchange, or other disposition is proposed to become final; and

(iv) the date that the transferring operator will relinquish possession as a result of the sale, assignment, transfer, lease conveyance, exchange, or other disposition.

(B) The person acquiring a geologic storage facility, whether by purchase, transfer, assignment, lease, conveyance, exchange, or other disposition, must notify the director in writing of the acquisition as soon as it is reasonably possible but not later than five business days after the date that the acquisition of the geologic storage facility becomes final. The director shall not approve the transfer of a geologic storage facility permit until the new operator provides all of the following:

(i) the name and address of the operator from which the geologic storage facility was acquired;

(ii) the name and location of the geologic storage facility and a description of the land upon which the geologic storage facility is situated;

(iii) the date that the acquisition became or will become final;

(iv) the date that possession was or will be acquired; and

(v) the financial assurance required by this subchapter.

(2) Evidence of financial responsibility. The operator acquiring the permit must provide the director with evidence of financial responsibility satisfactory to the director in accordance with §5.205 of this title (relating to Fees, Financial Responsibility, and Financial Assurance).

(3) Transfer of responsibility. An operator remains responsible for the geologic storage facility until the director approves in writing the sale, assignment, transfer, lease, conveyance, exchange, or other disposition and the person acquiring the storage facility complies with all applicable requirements.

(d) Modification, revocation and reissuance, or termination of a geologic storage facility permit.

(1) Permit review. Permits are subject to review by the Commission. Any interested person may request that the Commission review a permit issued under this subchapter for one of the reasons set forth in paragraph (2) of this subsection. All requests must be in writing and must contain facts or reasons supporting the request. If the Commission determines that the request may have merit or at the Commission's initiative for one or more of the reasons set forth in paragraph (2) of this subsection, the Commission may review the permit.

(2) Action by the Commission. The director may modify, revoke and reissue, or terminate a geologic storage facility permit after notice and opportunity for hearing under any of the following circumstances.

(A) Causes for modification or for revocation and reissuance. The following may be causes for revocation and reissuance as well as modification:

(i) Alterations. There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance that justify the inclusion of permit conditions that are different from or absent in the existing permit.

(ii) New information. The director has received new material information that was not available at the time of permit issuance and would have justified the inclusion of different permit conditions at the time of issuance. This may include any increase greater than the permitted CO_2 storage volume, and/or changes in the chemical composition of the CO_2 stream that in the judgment of the director, would interfere with the operation of the facility or its ability to meet the permit conditions.

(iii) New regulations. The standards or regulations on which the permit was based have been materially changed by promulgation of new or amended standards or regulations or by judicial decision after the permit was issued.

(iv) Compliance schedules. The director determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage, or other events over which the permittee has little or no control and for which there is no reasonably available remedy.

(v) Basis for permit modification. The director shall modify the permit whenever the director determines that permit changes are necessary based on:

(I) a re-evaluation under §5.203(d) of this title (relating to Application Requirements);

(II) any amendments to the testing and monitoring plan under §5.203(j) of this subchapter;

(III) any amendments to the injection well plugging plan under §5.203(k) of this title;

(IV) any amendments to the post-injection site care and site closure plan under §5.203(m) of this title;

(V) any amendments to the emergency and remedial response plan under §5.203(l) of this title;

(VI) a review of monitoring and/or testing results conducted in accordance with permit requirements;

(VII) cause exists for termination under subparagraph (B) of this paragraph, and the director determines that modification or revocation and reissuance is appropriate;

(VIII) the director has received notification of a proposed transfer of the permit; or

(IX) a determination that the fluid being injected is a hazardous waste as defined in 40 CFR §261.3 either because the definition has been revised, or because a previous determination has been changed.

(vi) If the director tentatively decides to modify or revoke and reissue a permit, the director shall prepare a draft permit incorporating the proposed changes. The director may request additional information and, in the case of a modified permit, may require the submission of an updated application. In the case of revoked and reissued permits, the director shall require the submission of a new application.

(vii) In a permit modification, only those conditions to be modified shall be reopened when a new draft permit is prepared. All other aspects of the existing permit shall remain in effect for the duration of the existing permit. When a permit is revoked and reissued under this section, the entire permit is reopened just as if the permit had expired and was being reissued. During any revocation and reissuance proceeding, the permittee shall comply with all conditions of the existing permit until a new final permit is reissued.

(viii) Upon the consent of the permittee, the director may modify a permit to make the corrections or allowances for minor changes in the permit, without following the procedures of subsection (e) of this section, and §5.204 of this title (relating to Notice of Permit Actions and Public Comment Period), to:

(I) correct typographical errors;

(II) require more frequent monitoring or reporting by the permittee;

(III) change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement;

(IV) allow for a change in ownership or operational control of a facility where the director determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittees has been submitted to the director;

(V) change quantities or types of fluids injected which are within the capacity of the facility as permitted and, in the judgment of the director, would not interfere with the operation of the facility or its ability to meet the permit conditions;

(VI) change construction requirements approved by the director pursuant to §5.206 of this title (relating to Permit Standards), provided that any such alteration shall comply with the requirements of this subchapter;

(VII) amend a plugging and abandonment plan which has been updated under §5.203(k) of this title; or

(VIII) amend an injection well testing and monitoring plan, plugging plan, post-injection site care and site closure plan, or emergency and remedial response plan where the modifications merely clarify or correct the plan, as determined by the director.

(B) Termination of permits.

(i) The following may be causes to terminate a permit during its term, or deny a permit renewal application:

(I) the permittee's failure to comply with any condition of the permit or applicable Commission orders or regulations;

(II) the permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time;

(III) fluids are escaping or are likely to escape from the injection zone;

(IV) USDWs are likely to be endangered as a result of the continued operation of the geologic storage facility; or

(V) a determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.

(ii) The director shall follow the applicable procedures in subsection (e) of this section, and §5.204 of this title, in terminating any permit under this section.

(iii) If the director tentatively decides to terminate a permit under this subchapter, where the permittee objects, the director shall issue a notice of intent to terminate. A notice of intent to terminate is a type of draft permit.

(3) Facility siting. Suitability of the facility location shall not be considered at the time of permit modification or revocation and reissuance unless new information or standards indicate that a threat to human health or the environment exists which was unknown at the time of permit issuance.

(4) Emergency shutdown. Notwithstanding the provisions of paragraph (2) of this subsection, in the event of an emergency that threatens endangerment to USDWs or to life or property, or an imminent threat of uncontrolled release of CO_2, the director may immediately order suspension of the operation of the geologic storage facility until a final order is issued pursuant to a hearing, if any.

(e) Draft permit and fact sheet.

(1) Draft permit; notice of intent to deny.

(A) Once a geologic storage facility permit application is complete, the director shall decide whether to prepare a draft permit or to deny the application.

(B) If the director tentatively decides to deny the permit application, the director shall issue a notice of intent to deny. A notice of intent to deny the permit application is a type of draft permit which follows the same procedures as any draft permit prepared under this section. If the director's final decision is that the tentative decision to deny the permit application was incorrect, the director shall withdraw the notice of intent to deny and proceed to prepare a draft permit.

(C) If the director decides to prepare a draft permit, the draft permit shall contain the permit conditions required under §5.206 of this title (relating to Permit Standards). If the director is issuing a denial, the permit conditions are not required.

(2) Fact sheet.

(A) The director shall prepare a fact sheet for every draft permit. The fact sheet shall briefly set forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit.

(B) The director shall send this fact sheet to the applicant and, on request, to any other person. The director shall post the fact sheet on the Commission's website.

(C) The fact sheet shall include, when applicable:

(i) a brief description of the type of facility or activity which is the subject of the draft permit;

(ii) the source and quantity of CO_2 proposed to be injected and stored;

(iii) the reasons why any requested variances or alternatives to required standards do or do not appear justified;

(iv) a description of the procedures for reaching a final decision on the draft permit including:

(I) the beginning and ending dates of the comment period;

(II) the address where comments will be received;

(III) The date, time, and location of the storage facility permit hearing, if a hearing has been scheduled; and

(IV) any other procedures by which the public may participate in the final decision; and

(v) the name and telephone number of a person to contact for additional information.

Source Note: The provisions of this §5.202 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

§5.203 Application Requirements

(a) General.

(1) Form and filing; signatories; certification.

(A) Form and filing. Each applicant for a permit to construct and operate a geologic storage facility must file an application with the division in Austin on a form prescribed by the Commission. The applicant must file the application and all attachments with the division and with EPA Region 6 in an electronic format approved by EPA. On the same date, the applicant must file one copy with each appropriate district office and one copy with the Executive Director of the Texas Commission on Environmental Quality.

(B) Signatories to permit applications. An applicant must ensure that the application is executed by a party having knowledge of the facts entered on the form and included in the required attachments. All permit applications shall be signed as specified in this subparagraph:

(i) For a corporation, the permit application shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(ii) For a partnership or sole proprietorship, the permit application shall be signed by a general partner or the proprietor, respectively.

(iii) For a municipality, State, Federal, or other public agency, the permit application shall be signed by either a principal executive officer or ranking elected official.

(C) Certification. Any person signing a permit application or permit amendment application shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(2) General information.

(A) On the application, the applicant must include the name, mailing address, and location of the facility for which the application is being submitted and the operator's name, address, telephone number, Commission Organization Report number, and ownership of the facility.

(B) When a geologic storage facility is owned by one person but is operated by another person, it is the operator's duty to file an application for a permit.

(C) The application must include a listing of all relevant permits or construction approvals for the facility received or applied for under federal or state environmental programs;

(D) A person making an application to the director for a permit under this subchapter must submit a copy of the application to the Texas Commission on Environmental Quality (TCEQ) and must submit to the director a letter of determination from TCEQ concluding that drilling and operating an anthropogenic CO_2 injection well for geologic storage or constructing or operating a geologic storage facility will not impact or interfere with any previous or existing Class I injection well, including any associated waste plume, or any other injection well authorized or permitted by TCEQ. The letter must be submitted to the director before any permit under this subchapter may be issued.

(3) Application completeness. The Commission shall not issue a permit before receiving a complete application. A permit application is complete when the director determines that the application contains information addressing each application requirement of the regulatory program and all information necessary to initiate the final review by the director.

(4) Reports. An applicant must ensure that all descriptive reports are prepared by a qualified and knowledgeable person and include an interpretation of the results of all logs, surveys, sampling, and tests required in this subchapter. The applicant must include in the application a quality assurance and surveillance plan for all testing and monitoring, which includes, at a minimum, validation of the analytical laboratory data, calibration of field instruments, and an explanation of the sampling and data acquisition techniques.

(5) If otherwise required under Occupations Code, Chapter 1001, relating to Texas Engineering Practice Act, or Chapter 1002, relating to Texas Geoscientists Practice Act, respectively, a licensed professional engineer or geoscientist must conduct the geologic and hydrologic evaluations required under this subchapter and must affix the appropriate seal on the resulting reports of such evaluations.

(b) Surface map and information. Only information of public record is required to be included on this map.

(1) The applicant must file with the director a surface map delineating the proposed location of any injection wells and the boundary of the geologic storage facility for which a permit is sought and the applicable AOR.

(2) The applicant must show within the AOR on the map the number or name and the location of:

(A) all known artificial penetrations through the confining zone, including injection wells, producing wells, inactive wells, plugged wells, or dry holes;

(B) the locations of cathodic protection holes, subsurface cleanup sites, bodies of surface water, springs, surface and subsurface mines, quarries, and water wells; and

(C) other pertinent surface features, including pipelines, roads, and structures intended for human occupancy.

(3) The applicant must identify on the map any known or suspected faults expressed at the surface.

(c) Geologic, geochemical, and hydrologic information.

(1) The applicant must submit a descriptive report prepared by a knowledgeable person that includes an interpretation of the results of appropriate logs, surveys, sampling, and testing sufficient to determine the depth, thickness, porosity, permeability, and lithology of, and the geochemistry of any formation fluids in, all relevant geologic formations.

(2) The applicant must submit information on the geologic structure and reservoir properties of the proposed storage reservoir and overlying formations, including the following information:

(A) geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the area from the ground surface to the base of the injection zone within the AOR that indicate the general vertical and lateral limits of all USDWs within the AOR, their positions relative to the storage reservoir and the direction of water movement, where known;

(B) the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of, and the geochemistry of any formation fluids in, the storage reservoir and confining zone and any other relevant geologic formations, including geology/facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs, and lithologic descriptions, and the analyses of logging, sampling, and testing results used to make such determinations;

(C) the location, orientation, and properties of known or suspected transmissive faults or fractures that may transect the confining zone within the AOR and a determination that such faults or fractures would not compromise containment;

(D) the seismic history, including the presence and depth of seismic sources, and a determination that the seismicity would not compromise containment;

(E) geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone;

(F) a description of the formation testing program used and the analytical results used to determine the chemical and physical characteristics of the injection zone and the confining zone; and

(G) baseline geochemical data for subsurface formations that will be used for monitoring purposes, including all formations containing USDWs within the AOR.

(d) AOR and corrective action. This subsection describes the standards for the information regarding the delineation of the AOR, the identification of penetrations, and corrective action that an applicant must include in an application.

(1) Initial delineation of the AOR and initial corrective action. The applicant must delineate the AOR, identify all wells that require corrective action, and perform corrective action on those wells. Corrective action may be phased.

(A) Delineation of AOR.

(i) Using computational modeling that considers the volumes and/or mass and the physical and chemical properties of the injected CO_2 stream, the physical properties of the formation into which the CO_2 stream is to be injected, and available data including data available from logging, testing, or operation of wells, the applicant must predict the lateral and vertical extent of migration for the CO_2 plume and formation fluids and the pressure differentials required to cause movement of injected fluids or formation fluids into a USDW in the subsurface for the following time periods:

(I) five years after initiation of injection;

(II) from initiation of injection to the end of the injection period proposed by the applicant; and

(III) from initiation of injection until the movement of the CO_2 plume and associated pressure front stabilizes.

(ii) The applicant must use a computational model that:

(I) is based on geologic and reservoir engineering information collected to characterize the injection zone and the confining zone;

(II) is based on anticipated operating data, including injection pressures, rates, temperatures, and total volumes and/or mass over the proposed duration of injection;

(III) takes into account relevant geologic heterogeneities and data quality, and their possible impact on model predictions;

(IV) considers the physical and chemical properties of injected and formation fluids; and

(V) considers potential migration through known faults, fractures, and artificial penetrations and beyond lateral spill points.

(iii) The applicant must provide the name and a description of the model, software, the assumptions used to determine the AOR, and the equations solved.

(B) Identification and table of penetrations. The applicant must identify, compile, and submit a table listing all penetrations, including active, inactive, plugged, and unplugged wells and underground mines in the AOR that may penetrate the confining zone, that are known or reasonably discoverable through specialized knowledge or experience. The applicant must provide a description of each penetration's type, construction, date drilled or excavated, location, depth, and record of plugging and/or completion or closure. Examples of specialized knowledge or experience may include reviews of federal, state, and local government records, interviews with past and present owners, operators, and occupants, reviews of historical information (including aerial photographs, chain of title documents, and land use records), and visual inspections of the facility and adjoining properties.

(C) Corrective action. The applicant must demonstrate whether each of the wells on the table of penetrations has or has not been plugged and whether each of the underground mines (if any) on the table of penetrations has or has not been closed in a manner that prevents the movement of injected fluids or displaced formation fluids that may endanger USDWs or allow the injected fluids or formation fluids to escape the permitted injection zone. The applicant must perform corrective action on all wells and underground mines in the AOR that are determined to need corrective action. The operator must perform corrective action using materials suitable for use with the CO_2 stream. Corrective action may be phased.

(2) AOR and corrective action plan. As part of an application, the applicant must submit an AOR and corrective action plan that includes the following information:

(A) the method for delineating the AOR, including the model to be used, assumptions that will be made, and the site characterization data on which the model will be based;

(B) for the AOR, a description of:

(i) the minimum frequency subject to the annual certification pursuant to §5.206(f) of this title (relating to Permit Standards) at which the applicant proposes to re-evaluate the AOR during the life of the geologic storage facility;

(ii) how monitoring and operational data will be used to re-evaluate the AOR; and

(iii) the monitoring and operational conditions that would warrant a re-evaluation of the AOR prior to the next scheduled re-evaluation; and

(C) a corrective action plan that describes:

(i) how the corrective action will be conducted;

(ii) how corrective action will be adjusted if there are changes in the AOR;

(iii) if a phased corrective action is planned, how the phasing will be determined; and

(iv) how site access will be secured for future corrective action.

(e) Injection well construction.

(1) Criteria for construction of anthropogenic CO_2 injection wells. This paragraph establishes the criteria

for the information about the construction and casing and cementing of, and special equipment for, anthropogenic CO_2 injection wells that an applicant must include in an application.

(A) General. The operator of a geologic storage facility must ensure that all anthropogenic CO_2 injection wells are constructed and completed in a manner that will:

(i) prevent the movement of injected CO_2 or displaced formation fluids into any unauthorized zones or into any areas where they could endanger USDWs;

(ii) allow the use of appropriate testing devices and workover tools; and

(iii) allow continuous monitoring of the annulus space between the injection tubing and long string casing.

(B) Casing and cementing of anthropogenic CO_2 injection wells.

(i) The operator must ensure that injection wells are cased and the casing cemented in compliance with §3.13 of this title (relating to Casing, Cementing, Drilling, Well Control, and Completion Requirements), in addition to the requirements of this section.

(ii) Casing, cement, cement additives, and/or other materials used in the construction of each injection well must have sufficient structural strength and must be of sufficient quality and quantity to maintain integrity over the design life of the injection well. All well materials must be suitable for use with fluids with which the well materials may be expected to come into contact and must meet or exceed test standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards as approved by the director.

(iii) Surface casing must extend through the base of the lowermost USDW above the injection zone and must be cemented to the surface.

(iv) Circulation of cement may be accomplished by staging. The director may approve an alternative method of cementing in cases where the cement cannot be circulated to the surface, provided the applicant can demonstrate by using logs that the cement does not allow fluid movement between the casing and the well bore.

(v) At least one long string casing, using a sufficient number of centralizers, must extend to the injection zone and must be cemented by circulating cement to the surface in one or more stages. The long string casing must isolate the injection zone and other intervals as necessary for the protection of USDWs and to ensure confinement of the injected and formation fluids to the permitted injection zone using cement and/or other isolation techniques. If the long string casing does not extend through the injection zone, another well string or liner must be cemented through the injection zone (for example, a chrome liner).

(vi) The applicant must verify the integrity and location of the cement using technology capable of radial evaluation of cement quality and identification of the location of channels to ensure that USDWs will not be endangered.

(vii) The director may exempt existing Class II wells that have been associated with injection of CO_2 for the purpose of enhanced recovery, Class V experimental technology wells, and stratigraphic test wells from provisions of these casing and cementing requirements if the applicant demonstrates that the well construction meets the general performance criteria in subparagraph (A) of this paragraph. A converted well must meet all other requirements under this section. The demonstration must include the following:

(I) as-built schematics and construction procedures to demonstrate that repermitting is appropriate;

(II) recent or newly conducted well-log information and mechanical integrity test results;

(III) a demonstration that any needed remedial actions have been performed;

(IV) a demonstration that the well was engineered and constructed to meet the requirements of subparagraph (A) of this paragraph and ensure protection of USDWs;

(V) a demonstration that cement placement and materials are appropriate for CO_2 injection for geologic storage;

(VI) a demonstration that the well has, and is able to maintain, internal and external mechanical integrity over the life of the project; and

(VII) the results of any additional testing of the well to support a demonstration of suitability for geologic storage.

(C) Special equipment.

(i) Tubing and packer. All injection wells must inject fluids through tubing set on a packer. Packers must be set no higher than 100 feet above the top of the permitted injection interval or at a location approved by the director.

(ii) Pressure observation valve. The wellhead of each injection well must be equipped with a pressure observation valve on the tubing and each annulus of the well.

(2) Construction information. The applicant must provide the following information for each well to allow the director to determine whether the proposed well

construction and completion design will meet the general performance criteria in paragraph (1) of this subsection:

(A) depth to the injection zone;

(B) hole size;

(C) size and grade of all casing and tubing strings (e.g., wall thickness, external diameter, nominal weight, length, joint specification and construction material, tubing tensile, burst, and collapse strengths);

(D) proposed injection rate (intermittent or continuous), maximum proposed surface injection pressure, and maximum proposed volume and/or mass of the CO_2 stream to be injected;

(E) type of packer and packer setting depth;

(F) a description of the capability of the materials to withstand corrosion when exposed to a combination of the CO_2 stream and formation fluids;

(G) down-hole temperatures and pressures;

(H) lithology of injection and confining zones;

(I) type or grade of cement and additives;

(J) chemical composition and temperature of the CO_2 stream; and

(K) schematic drawings of the surface and subsurface construction details.

(3) Well construction plan. The applicant must submit an injection well construction plan that meets the criteria in paragraph (1) of this subsection.

(4) Well stimulation plan. The applicant must submit, as applicable, a description of the proposed well stimulation program and a determination that well stimulation will not compromise containment.

(f) Plan for logging, sampling, and testing of injection wells after permitting but before injection. The applicant must submit a plan for logging, sampling, and testing of each injection well after permitting but prior to injection well operation. The plan need not include identical logging, sampling, and testing procedures for all wells provided there is a reasonable basis for different procedures. Such plan is not necessary for existing wells being converted to anthropogenic CO_2 injection wells in accordance with this subchapter, to the extent such activities already have taken place. The plan must describe the logs, surveys, and tests to be conducted to verify the depth, thickness, porosity, permeability, and lithology of, and the salinity of any formation fluids in, the formations that are to be used for monitoring, storage, and confinement to assure conformance with the injection well construction requirements set forth in subsection (e) of this section, and to establish accurate baseline data against which future measurements may be compared. The plan must meet the following criteria and must include the following information.

(1) Logs and surveys of newly drilled and completed injection wells.

(A) During the drilling of any hole that is constructed by drilling a pilot hole that is enlarged by reaming or another method, the operator must perform deviation checks at sufficiently frequent intervals to determine the location of the borehole and to assure that vertical avenues for fluid movement in the form of diverging holes are not created during drilling.

(B) Before surface casing is installed, the operator must run appropriate logs, such as resistivity, spontaneous potential, and caliper logs.

(C) After each casing string is set and cemented, the operator must run logs, such as a cement bond log, variable density log, and a temperature log, to ensure proper cementing.

(D) Before long string casing is installed, the operator must run logs appropriate to the geology, such as resistivity, spontaneous potential, porosity, caliper, gamma ray, and fracture finder logs, to gather data necessary to verify the characterization of the geology and hydrology.

(2) Testing and determination of hydrogeologic characteristics of injection and confining zone.

(A) Prior to operation, the operator must conduct tests to verify hydrogeologic characteristics of the injection zone.

(B) The operator must perform an initial pressure fall-off or other test and submit to the director a written report of the results of the test, including details of the methods used to perform the test and to interpret the results, all necessary graphs, and the testing log, to verify permeability, injectivity, and initial pressure using water or CO_2.

(C) The operator must determine or calculate the fracture pressures for the injection and confining zone. The Commission will include in any permit it might issue a limit of 90% of the fracture pressure to ensure that the injection pressure does not exceed the fracture pressure of the injection zone.

(3) Sampling.

(A) The operator must record and submit the formation fluid temperature, pH, and conductivity, the reservoir pressure, and the static fluid level of the injection zone.

(B) The operator must submit analyses of whole cores or sidewall cores representative of the injection zone and confining zone and formation fluid samples from the injection zone. The director may accept data from cores and formation fluid samples from nearby wells or other data if the operator can demonstrate to the director that such data are representative of conditions at the proposed injection well.

(g) Compatibility determination. Based on the results of the formation testing program required by subsection (f) of this section, the applicant must submit a determination of the compatibility of the CO_2 stream with:

(1) the materials to be used to construct the well;

(2) fluids in the injection zone; and

(3) minerals in both the injection and the confining zone.

(h) Mechanical integrity testing.

(1) Criteria. This paragraph establishes the criteria for the mechanical integrity testing plan for anthropogenic CO_2 injection wells that an applicant must include in an application.

(A) Other than during periods of well workover in which the sealed tubing-casing annulus is of necessity disassembled for maintenance or corrective procedures, the operator must maintain mechanical integrity of the injection well at all times.

(B) Before beginning injection operations and at least once every five years thereafter, the operator must demonstrate internal mechanical integrity for each injection well by pressure testing the tubing-casing annulus.

(C) Following an initial annulus pressure test, the operator must continuously monitor injection pressure, rate, temperature, injected volumes and mass, and pressure on the annulus between tubing and long string casing to confirm that the injected fluids are confined to the injection zone. If mass is determined using volume, the operator must provide calculations.

(D) At least once per year until the injection well is plugged, the operator must confirm the absence of significant fluid movement into a USDW through channels adjacent to the injection wellbore (external integrity) using a method approved by the director (e.g., diagnostic surveys such as oxygen-activation logging or temperature or noise logs).

(E) The operator must test injection wells after any workover that disturbs the seal between the tubing, packer, and casing in a manner that verifies internal mechanical integrity of the tubing and long string casing.

(F) An operator must either repair and successfully retest or plug a well that fails a mechanical integrity test.

(2) Mechanical integrity testing plan. The applicant must prepare and submit a mechanical integrity testing plan as part of a permit application. The performance tests must be designed to demonstrate the internal and external mechanical integrity of each injection well. These tests may include:

(A) a pressure test with liquid or inert gas;

(B) a tracer survey such as oxygen-activation logging;

(C) a temperature or noise log;

(D) a casing inspection log; and/or

(E) any alternative method approved by the director, and if necessary by the Administrator of EPA under 40 CFR §146.89(e), that provides equivalent or better information approved by the director.

(i) Operating information.

(1) Operating plan. The applicant must submit a plan for operating the injection wells and the geologic storage facility that complies with the criteria set forth in §5.206(d) of this title, and that outlines the steps necessary to conduct injection operations. The applicant must include the following proposed operating data in the plan:

(A) the average and maximum daily injection rates, temperature, and volumes and/or mass of the CO_2 stream;

(B) the average and maximum surface injection pressure;

(C) the sources of the CO_2 stream and the volume and/or mass of CO_2 from each source; and

(D) an analysis of the chemical and physical characteristics of the CO_2 stream prior to injection.

(2) Maximum injection pressure. The director will approve a maximum injection pressure limit that:

(A) considers the risks of tensile failure and, where appropriate, geomechanical or other studies that assess the risk of tensile failure and shear failure;

(B) with a reasonable degree of certainty will avoid initiation or propagation of fractures in the confining zone or cause otherwise non-transmissive faults transecting the confining zone to become transmissive; and

(C) in no case may cause the movement of injection fluids or formation fluids in a manner that endangers USDWs.

(j) Plan for monitoring, sampling, and testing after initiation of operation.

(1) The applicant must submit a monitoring, sampling, and testing plan for verifying that the geologic storage facility is operating as permitted and that the injected fluids are confined to the injection zone.

(2) The plan must include the following:

(A) the analysis of the CO_2 stream prior to injection with sufficient frequency to yield data representative of its chemical and physical characteristics;

(B) the installation and use of continuous recording devices to monitor injection pressure, rate, temperature, and volume and/or mass, and the pressure on the annulus between the tubing and the long string casing, except during workovers;

(C) after initiation of injection, the performance on a semi-annual basis of corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion to ensure that the well components meet the minimum standards for material strength and performance set forth in subsection (e)(1)(A) of this section. The operator must report the results of such monitoring annually. Corrosion monitoring may be accomplished by:

(i) analyzing coupons of the well construction materials in contact with the CO_2 stream;

(ii) routing the CO_2 stream through a loop constructed with the materials used in the well and inspecting the materials in the loop; or

(iii) using an alternative method, materials, or time period approved by the director;

(D) monitoring of geochemical and geophysical changes, including:

(i) periodic sampling of the fluid temperature, pH, conductivity, reservoir pressure and static fluid level of the injection zone and monitoring for pressure changes, and for changes in geochemistry, in a permeable and porous formation near to and above the top confining zone;

(ii) periodic monitoring of the quality and geochemistry of a USDW within the AOR and the formation fluid in a permeable and porous formation near to and above the top confining zone to detect any movement of the injected CO_2 through the confining zone into that monitored formation;

(iii) the location and number of monitoring wells justified on the basis of the AOR, injection rate and volume, geology, and the presence of artificial penetrations and other factors specific to the geologic storage facility; and

(iv) the monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data collected under subsection (c)(2) of this section and any modeling results in the AOR evaluation;

(E) tracking the extent of the CO_2 plume and the position of the pressure front by using indirect, geophysical techniques, which may include seismic, electrical, gravity, or electromagnetic surveys and/or down-hole CO_2 detection tools;

(F) A pressure fall-off test at least once every five years unless more frequent testing is required by the director based on site-specific information; and

(G) additional monitoring as the director may determine to be necessary to support, upgrade, and improve computational modeling of the AOR evaluation and to determine compliance with the requirements that the injection activity not allow the movement of fluid containing any contaminant into USDWs and that the injected fluid remain within the permitted interval.

(k) Well plugging plan. The applicant must submit a well plugging plan for all injection wells and monitoring wells that penetrate the base of usable quality water that includes the following:

(1) a proposal for plugging all monitoring wells that penetrate the base of usable quality water and all injection wells upon abandonment in accordance with §3.14 of this title (relating to Plugging), in addition to the requirements of this section. The proposal must include:

(A) the type and number of plugs to be used;

(B) the placement of each plug, including the elevation of the top and bottom of each plug;

(C) the type, grade, and quantity of material to be used in plugging and information to demonstrate that the material is compatible with the CO_2 stream; and

(D) the method of placement of the plugs;

(2) proposals for activities to be undertaken prior to plugging an injection well, specifically:

(A) flushing each injection well with a buffer fluid;

(B) performing tests or measures to determine bottomhole reservoir pressure;

(C) performing final tests to assess mechanical integrity; and

(D) ensuring that the material to be used in plugging must be compatible with the CO_2 stream and the formation fluids;

(3) a proposal for giving notice of intent to plug monitoring wells that penetrate the base of usable quality water and all injection wells. The applicant's plan must ensure that:

(A) the operator notifies the director at least 60 days before plugging a well. At this time, if any changes have been made to the original well plugging plan, the operator must also provide a revised well plugging plan. At the discretion of the director, an operator may be allowed to proceed with well plugging on a shorter notice period; and

(B) the operator will file a notice of intention to plug and abandon (Form W-3A) a well with the appropriate Commission district office and the division in Austin at least five days prior to the beginning of plugging operations;

(4) a plugging report for monitoring wells that penetrate the base of usable quality water and all injection wells. The applicant's plan must ensure that within 30 days after plugging the operator will file a complete well plugging record (Form W-3) in duplicate with the appropriate district office. The operator and the person who performed the plugging operation (if other than the operator) must certify the report as accurate;

(5) a plan for plugging all monitoring wells that do not penetrate the base of usable quality water in accordance with 16 TAC Chapter 76 (relating to Water Well Drillers and Water Well Pump Installers); and

(6) a plan for certifying that all monitoring wells that do not penetrate the base of usable quality water will be plugged in accordance with 16 TAC Chapter 76.

(l) Emergency and remedial response plan. The applicant must submit an emergency and remedial response plan that:

(1) accounts for the entire AOR, regardless of whether or not corrective action in the AOR is phased;

(2) describes actions to be taken to address escape from the permitted injection interval or movement of the injection fluids or formation fluids that may cause an endangerment to USDWs during construction, operation, closure, and post-closure periods;

(3) includes a safety plan that includes:

(A) emergency response procedures;

(B) provisions to provide security against unauthorized activity;

(C) CO_2 release detection and prevention measures;

(D) instructions and procedures for alerting the general public and public safety personnel of the existence of an emergency;

(E) procedures for requesting assistance and for follow-up action to remove the public from an area of exposure;

(F) provisions for advance briefing of the public within the AOR on subjects such as the hazards and characteristics of CO_2,

(G) the manner in which the public will be notified of an emergency and steps to be taken in case of an emergency; and

(H) if necessary, proposed actions designed to minimize and respond to risks associated with potential seismic events, including seismic monitoring; and

(4) includes a description of the training and testing that will be provided to each employee at the storage facility on operational safety and emergency response procedures to the extent applicable to the employee's duties and responsibilities. The operator must train all employees before commencing injection and storage operations at the facility. The operator must train each subsequently hired employee before that employee commences work at the storage facility. The operator must hold a safety meeting with each contractor prior to the commencement of any new contract work at a storage facility. Emergency measures specific to the contractor's work must be explained in the contractor safety meeting. Training schedules, training dates, and course outlines must be provided to Commission personnel upon request for the purpose of Commission review to determine compliance with this paragraph.

(m) Post-injection storage facility care and closure plan. The applicant must submit a post-injection storage facility care and closure plan. The plan must include:

(1) a demonstration containing substantial evidence that the geologic storage project will no longer pose a risk of endangerment to USDWs at the end of the post-injection storage facility care timeframe. The demonstration must be based on significant, site-specific data and information, including all data and information collected pursuant subsections (b)-(d) of this section and §5.206(b)(5) of this title;

(2) the pressure differential between pre-injection and predicted post-injection pressures in the injection zone;

(3) the predicted position of the CO_2 plume and associated pressure front at closure as demonstrated in the AOR evaluation required under subsection (d) of this section;

(4) a description of the proposed post-injection monitoring location, methods, and frequency;

(5) a proposed schedule for submitting post-injection storage facility care monitoring results to the director;

(6) the estimated cost of proposed post-injection storage facility care and closure; and

(7) consideration and documentation of:

(A) the results of computational modeling performed pursuant to delineation of the AOR under subsection (d) of this section;

(B) the predicted timeframe for pressure decline within the injection zone, and any other zones, such that formation fluids may not be forced into any USDWs, and/or the timeframe for pressure decline to pre-injection pressures;

(C) the predicted rate of CO_2 plume migration within the injection zone, and the predicted timeframe for the stabilization of the CO_2 plume and associated pressure front;

(D) a description of the site-specific processes that will result in CO_2 trapping including immobilization by capillary trapping, dissolution, and mineralization at the site;

(E) the predicted rate of CO_2 trapping in the immobile capillary phase, dissolved phase, and/or mineral phase;

(F) the results of laboratory analyses, research studies, and/or field or site-specific studies to verify the information required in subparagraphs (D) and (E) of this paragraph;

(G) a characterization of the confining zone(s) including a demonstration that it is free of transmissive faults, fractures, and micro-fractures and of appropriate thickness, permeability, and integrity to impede fluid (e.g., CO_2, formation fluids) movement;

(H) the presence of potential conduits for fluid movement including planned injection wells and project monitoring wells associated with the proposed geologic storage project or any other projects in proximity to the predicted/modeled, final extent of the CO_2 plume and area of elevated pressure;

(I) a description of the well construction and an assessment of the quality of plugs of all abandoned wells within the AOR;

(J) the distance between the injection zone and the nearest USDWs above and/or below the injection zone; and

(K) any additional site-specific factors required by the director; and

(8) information submitted to support the demonstration in paragraph (1) of this subsection, which shall meet the following criteria:

(A) all analyses and tests performed to support the demonstration must be accurate, reproducible, and performed in accordance with the established quality assurance standards;

(B) estimation techniques must be appropriate and EPA-certified test protocols must be used where available;

(C) predictive models must be appropriate and tailored to the site conditions, composition of the CO_2 stream, and injection and site conditions over the life of the geologic storage project;

(D) predictive models must be calibrated using existing information where sufficient data are available;

(E) reasonably conservative values and modeling assumptions must be used and disclosed to the director whenever values are estimated on the basis of known, historical information instead of site-specific measurements;

(F) an analysis must be performed to identify and assess aspects of the alternative PISC timeframe demonstration that contribute significantly to uncertainty. The operator must conduct sensitivity analyses to determine the effect that significant uncertainty may contribute to the modeling demonstration;

(G) an approved quality assurance and quality control plan must address all aspects of the demonstration; and

(H) any additional criteria required by the director.

(n) Fees, financial responsibility, and financial assurance. The applicant must pay the fees, demonstrate that it has met the financial responsibility requirements, and provide the Commission with financial assurance as required under §5.205 of this title (relating to Fees, Financial Responsibility, and Financial Assurance).

(1) The applicant must demonstrate financial responsibility and resources for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided to the operator a written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.

(2) In determining whether the applicant is financially responsible, the director must rely on the following:

(A) the person's most recent audited annual report filed with the U. S. Securities and Exchange Commission under Section 13 or 15(d), Securities Exchange Act of 1934 (15 U.S.C. Section 78m or 78o(d)). The date of the audit may not be more than one year before the date of submission of the application to the division; and

(B) the person's most recent quarterly report filed with the U. S. Securities and Exchange Commission under Section 13 or 15(d), Securities Exchange Act of 1934 (15 U.S.C. Section 78m or 78o(d)); or

(C) if the person is not required to file such a report, the person's most recent audited financial statement. The date of the audit must not be more than one year before the date of submission of the application to the division.

(o) Letter from the Groundwater Advisory Unit of the Oil and Gas Division. The applicant must submit a letter from the Groundwater Advisory Unit of the Oil and Gas Division in accordance with Texas Water Code, §27.046.

(p) Other information. The applicant must submit any other information requested by the director as necessary to discharge the Commission's duties under Texas

Water Code, Chapter 27, Subchapter B-1, or deemed necessary by the director to clarify, explain, and support the required attachments.

Source Note: The provisions of this §5.203 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202; amended to be effective July 2, 2012, 37 TexReg 4899; amended to be effective September 19, 2022, 47 TexReg 5797

§5.204 Notice of Permit Actions and Public Comment Period

(a) Notice requirements.

(1) The Commission shall give notice of the following actions:

(A) a draft permit has been prepared under §5.202(e) of this title (relating to Permit Required, and Draft Permit and Fact Sheet); and

(B) a hearing that has been scheduled under subsection (b)(2) of this section.

(2) General notice by publication. The Commission shall publish notice of a draft permit once a week for three consecutive weeks in a newspaper of general circulation in each county where the storage facility is located or is to be located. The Commission shall also post notice of a draft permit on the Commission's website.

(3) Methods of notification. The Commission shall give notice by the following methods:

(A) Individual notice. Notice of a draft permit or a public hearing shall be given by mailing a copy of the notice to the following persons:

(i) the applicant;

(ii) the United States Environmental Protection Agency;

(iii) the Texas Commission on Environmental Quality, the Texas Water Development Board, the Texas Department of State Health Services, the Texas Parks and Wildlife Department, the Texas General Land Office, the Texas Historical Commission, the United States Fish and Wildlife Service, other Federal and State agencies with jurisdiction over fish, shellfish, and wildlife resources, and coastal zone management plans, the Advisory Council on Historic Preservation, including any affected States (Indian Tribes) and any agency that the Commission knows has issued or is required to issue a permit for the same facility under any federal or state environmental program;

(iv) each adjoining mineral interest owner, other than the applicant, of the outermost boundary of the proposed geologic storage facility;

(v) each leaseholder and interest owner of minerals lying above or below the proposed geologic storage facility;

(vi) each adjoining leaseholder of minerals offsetting the outermost boundary of the proposed geologic storage facility;

(vii) each owner or leaseholder of any portion of the surface overlying the proposed geologic storage facility and the adjoining area of the outermost boundary of the proposed geologic storage facility;

(viii) the clerk of the county or counties where the proposed geologic storage facility is located or is proposed to be located;

(ix) the city clerk or other appropriate city official where the proposed geologic storage facility is located within city limits;

(x) any other unit of local government having jurisdiction over the area where the geologic storage facility is or is proposed to be located, and each state agency having any authority under state law with respect to the construction or operation of the geologic storage facility;

(xi) persons on the mailing list developed by the Commission, including those who request in writing to be on the list and by soliciting participants in public hearings in that area for their interest in being included on area mailing lists; and

(xii) any other class of persons that the director determines should receive notice of the application.

(B) Any person otherwise entitled to receive notice under this paragraph may waive his or her rights to receive notice of a draft permit under this subsection.

(4) Content of notice. Individual notice must consist of:

(A) the applicant's intention to construct and operate an anthropogenic CO_2 geologic storage facility;

(B) a description of the geologic storage facility location;

(C) a copy of any draft permit and fact sheet;

(D) each physical location and the internet address at which a copy of the application may be inspected;

(E) a statement that:

(i) affected persons may protest the application;

(ii) protests must be filed in writing and must be mailed or delivered to Technical Permitting, Oil and Gas Division, Railroad Commission of Texas, P.O. Box 12967, Austin, Texas 78711; and

(iii) protests must be received by the director within 30 days of the date of receipt of the application by the division, receipt of individual notice, or last publication of notice, whichever is later; and

(F) information satisfying the requirements of 40 CFR §124.10(d)(1).

(5) Individual notice by publication. The applicant must make diligent efforts to ascertain the name and address of each person identified under paragraph (3)(A) of this subsection. The exercise of diligent efforts to ascertain the names and addresses of such persons requires an examination of county records where the facility is located and an investigation of any other information that is publicly and/or reasonably available to the applicant. If, after diligent efforts, an applicant has been unable to ascertain the name and address of one or more persons required to be notified under paragraph (3)(A) of this subsection, the applicant satisfies the notice requirements for those persons by the publication of the notice of application as required in paragraph (2) of this subsection. The applicant must submit an affidavit to the director specifying the efforts that the applicant took to identify each person whose name and/or address could not be ascertained.

(6) Notice to certain communities. The applicant shall identify whether any portions of the AOR encompass an Environmental Justice (EJ) or Limited English-Speaking Household community using the most recent U.S. Census Bureau American Community Survey data. If the AOR incudes an EJ or Limited English-Speaking Household community, the applicant shall conduct enhanced public outreach activities to these communities. Efforts to include EJ and Limited English-Speaking Household communities in public involvement activities in such cases shall include:

(A) published meeting notice in English and the identified language (e.g., Spanish);

(B) comment forms posted on the applicant's webpage and available at public meeting in English and the alternate language;

(C) interpretation services accommodated upon request;

(D) English translation of any comments made during any comment period in the alternate language; and

(E) to the extent possible, public meeting venues near public transportation.

(7) Comment period for a draft permit. Public notice of a draft permit, including a notice of intent to deny a permit application, shall allow at least 30 days for public comment.

(b) Public comment and hearing requirements.

(1) Public comment.

(A) During the public comment period, any interested person may submit written comments on the draft permit and may request a hearing if one has not already been scheduled.

(B) Reasonable limits may be set upon the time allowed for oral statements, and the submission of statements in writing may be required.

(C) The public comment period shall automatically be extended to the close of any public hearing under this section. The hearing examiner may also extend the comment period by so stating at the hearing.

(2) Public hearing.

(A) If the Commission receives a protest regarding an application for a new permit or for an amendment of an existing permit for a geologic storage facility from a person notified pursuant to subsection (a) of this section or from any other affected person within 30 days of the date of receipt of the application by the division, receipt of individual notice, or last publication of notice, whichever is later, then the director will notify the applicant that the director cannot administratively approve the application. Upon the written request of the applicant, the director will schedule a hearing on the application.

(B) The director shall hold a public hearing whenever the director finds, on the basis of requests, a significant degree of public interest in a draft permit.

(C) The director may also hold a public hearing at the director's discretion, whenever, for instance, such a hearing might clarify one or more issues involved in the permit decision.

(D) Public notice of a public hearing shall be given at least 30 days before the hearing. Public notice of a hearing may be given at the same time as public notice of the draft permit and the two notices may be combined.

(E) Upon the written request of the applicant, the Commission must give notice of a hearing to all affected persons, local governments, and other persons who express, in writing, an interest in the application. After the hearing, the examiner will recommend a final action by the Commission. Notices shall include information satisfying the requirements of 40 CFR §124.10(d)(2) and the Texas Government Code, §2001.052.

(3) If the Commission receives no protest regarding an application for a new permit or for the amendment of an existing permit for a geologic storage facility from a person notified pursuant to subsection (a) of this section or from any other affected person, the director may administratively approve the application.

(4) If the director administratively denies an application for a new permit or for the amendment of an

existing permit for a geologic storage facility, upon the written request of the applicant, the director will schedule a hearing. After hearing, the examiner will recommend a final action by the Commission.

Source Note: The provisions of this §5.204 adopted to be effective December 20, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

§5.205 Fees, Financial Responsibility, and Financial Assurance

(a) Fees. In addition to the fee for each injection well required by §3.78 of this title (relating to Fees and Financial Security Requirements), the following non-refundable fees must be remitted to the Commission with the application:

(1) Base application fee.

(A) The applicant must pay to the Commission an application fee of $50,000 for each permit application for a geologic storage facility.

(B) The applicant must pay to the Commission an application fee of $25,000 for each application to amend a permit for a geologic storage facility.

(2) Injection fee. The operator must pay to the Commission an annual fee of $0.025 per metric ton of CO_2 injected into the geologic storage facility.

(3) Post-injection care fee. The operator must pay to the Commission an annual fee of $50,000 each year the operator does not inject into the geologic storage facility until the director has authorized storage facility closure.

(b) Financial responsibility.

(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The operator must demonstrate and maintain financial responsibility and resources for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.

(2) In determining whether the person is financially responsible, the director must rely on:

(A) the person's most recent audited annual report filed with the U. S. Securities and Exchange Commission under Section 13 or 15(d), Securities Exchange Act of 1934 (15 U.S.C. Section 78m or 78o(d)); and

(B) the person's most recent quarterly report filed with the U. S. Securities and Exchange Commission under Section 13 or 15(d), Securities Exchange Act of 1934 (15 U.S.C. Section 78m or 78o(d)); or

(C) if the person is not required to file such a report, the person's most recent audited financial statement. The date of the audit must not be more than one year before the date of submission of the application to the director.

(3) The applicant's demonstration of financial responsibility must account for the entire AOR, regardless of whether corrective action in the AOR is phased.

(c) Financial assurance.

(1) Injection and monitoring wells. The operator must comply with the requirements of §3.78 of this title for all monitoring wells that penetrate the base of usable quality water and this subsection for all injection wells.

(2) Geologic storage facility.

(A) The applicant must include in an application for a geologic storage facility permit:

(i) a written estimate of the highest likely dollar amount necessary to perform post-injection monitoring and closure of the facility that shows all assumptions and calculations used to develop the estimate;

(ii) a copy of the form of the bond or letter of credit that will be filed with the Commission; and

(iii) information concerning the issuer of the bond or letter of credit including the issuer's name and address and evidence of authority to issue bonds or letters of credit in Texas.

(B) A geologic storage facility shall not receive CO_2 until a bond or letter of credit in an amount approved by the director under this subsection and meeting the requirements of this subsection as to form and issuer has been filed with and approved by the director.

(C) The determination of the amount of financial assurance for a geologic storage facility is subject to the following requirements:

(i) The director must approve the dollar amount of the financial assurance. The amount of financial assurance required to be filed under this subsection must be equal to or greater than the maximum amount necessary to perform corrective action, emergency response, and remedial action, post-injection monitoring and site care, and closure of the geologic storage facility at any time during the permit term in accordance with all applicable state laws, Commission rules and orders, and the permit;

(ii) A qualified professional engineer licensed by the State of Texas, as required under Occupations Code, Chapter 1001, relating to Texas Engineering Practice Act, must prepare or supervise the preparation of a written estimate of the highest likely amount necessary to close the geologic storage facility. The operator must submit to the director the written estimate under seal of a qualified licensed professional engineer, as required under Occupations Code, Chapter 1001, relating to Texas Engineering Practice Act; and

(iii) The Commission may use the proceeds of financial assurance filed under this subsection to pay the costs of plugging any well or wells at the facility if the financial assurance for plugging costs filed with the Commission is insufficient to pay for the plugging of such well or wells.

(D) Bonds and letters of credit filed in satisfaction of the financial assurance requirements for a geologic storage facility must comply with the following standards as to issuer and form.

(i) The issuer of any geologic storage facility bond filed in satisfaction of the requirements of this subsection must be a corporate surety authorized to do business in Texas. The form of bond filed under this subsection must provide that the bond be renewed and continued in effect until the conditions of the bond have been met or its release is authorized by the director.

(ii) Any letter of credit filed in satisfaction of the requirements of this subsection must be issued by and drawn on a bank authorized under state or federal law to operate in Texas. The letter of credit must be an irrevocable, standby letter of credit subject to the requirements of Texas Business and Commerce Code, §§5.101 - 5.118. The letter of credit must provide that it will be renewed and continued in effect until the conditions of the letter of credit have been met or its release is authorized by the director.

(E) The operator of a geologic storage facility must provide to the director annual written updates of the cost estimate to increase or decrease the cost estimate to account for any changes to the AOR and corrective action plan, the emergency response and remedial action plan, the injection well plugging plan, and the post-injection storage facility care and closure plan. The operator must provide to the director upon request an adjustment of the cost estimate if the director has reason to believe that the original demonstration is no longer adequate to cover the cost of injection well plugging and post-injection storage facility care and closure.

(3) The director may consider allowing the phasing in of financial assurance for only corrective action based on project-specific factors.

(4) The director may approve a reduction in the amount of financial assurance required for post-injection monitoring and/or corrective action based on project-specific monitoring results.

(d) Notice of adverse financial conditions.

(1) The operator must notify the Commission of adverse financial conditions that may affect the operator's ability to carry out injection well plugging and post-injection storage facility care and closure. An operator must file any notice of bankruptcy in accordance with §3.1(f) of this title (relating to Organization Report; Retention of Records; Notice Requirements). The operator must give such notice by certified mail.

(2) The operator filing a bond must ensure that the bond provides a mechanism for the bond or surety company to give prompt notice to the Commission and the operator of any action filed alleging insolvency or bankruptcy of the surety company or the bank or alleging any violation that would result in suspension or revocation of the surety or bank's charter or license to do business.

(3) Upon the incapacity of a bank or surety company by reason of bankruptcy, insolvency or suspension, or revocation of its charter or license, the Commission must deem the operator to be without bond coverage. The Commission must issue a notice to any operator who is without bond coverage and must specify a reasonable period to replace bond coverage, not to exceed 60 days.

Source Note: The provisions of this §5.205 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

§5.206 Permit Standards

(a) Each condition applicable to a permit shall be incorporated into the permit either expressly or by reference. If incorporated by reference, a specific citation to the rules in this chapter shall be given in the permit. The requirements listed in this section are directly enforceable regardless of whether the requirement is a condition of the permit.

(b) General criteria. The director may issue a permit under this subchapter if the applicant demonstrates and the director finds that:

(1) the injection and geologic storage of anthropogenic CO_2 will not endanger or injure any existing or prospective oil, gas, geothermal, or other mineral resource, or cause waste as defined by Texas Natural Resources Code, §85.046(11);

(2) with proper safeguards, both USDWs and surface water can be adequately protected from CO_2 migration or displaced formation fluids;

(3) the injection of anthropogenic CO_2 will not endanger or injure human health and safety;

(4) the reservoir into which the anthropogenic CO_2 is injected is suitable for or capable of being made suitable for protecting against the escape or migration of anthropogenic CO_2 from the storage reservoir;

(5) the geologic storage facility will be sited in an area with suitable geology, which at a minimum must include:

(A) an injection zone of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the CO_2 stream; and

(B) a confining zone that is laterally continuous and free of known transecting transmissive faults or fractures over an area sufficient to contain the injected CO_2 stream and displaced formation fluids and allow injection at proposed maximum pressures and volumes without compromising the confining zone or causing the movement of fluids that endangers USDWs;

(6) the applicant for the permit meets all of the other statutory and regulatory requirements for the issuance of the permit;

(7) the applicant has provided a letter from the Groundwater Advisory Unit of the Oil and Gas Division in accordance with §5.203(o) of this title (relating to Application Requirements);

(8) the applicant has provided a letter of determination from TCEQ concluding that drilling and operating an anthropogenic CO_2 injection well for geologic storage or constructing or operating a geologic storage facility will not impact or interfere with any previous or existing Class I injection well, including any associated waste plume, or any other injection well authorized or permitted by TCEQ;

(9) the applicant has provided a signed statement that the applicant has a good faith claim to the necessary and sufficient property rights for construction and operation of the geologic storage facility for at least the first five years after initiation of injection in accordance with §5.203(d)(1)(A) of this title;

(10) the applicant has paid the fees required in §5.205(a) of this title (relating to Fees, Financial Responsibility, and Financial Assurance);

(11) the director has determined that the applicant has sufficiently demonstrated financial responsibility as required in §5.205(b) of this title; and

(12) the applicant submitted to the director financial assurance in accordance with §5.205(c) of this title.

(c) Injection well construction.

(1) Construction of anthropogenic CO_2 injection wells must meet the criteria in §5.203(e) of this title.

(2) Within 30 days after the completion or conversion of an injection well subject to this subchapter, the operator must file with the division a complete record of the well on the appropriate form showing the current completion.

(3) Except in the case of an emergency repair, the operator of a geologic storage facility must notify the director in writing at least 30 days prior to conducting any well workover that involves running tubing and setting packers, beginning any workover or remedial operation, or conducting any required pressure tests or surveys. Such activities shall not commence before the end of the 30 days unless authorized by the director. In the case of an emergency repair, the operator must notify the director of such emergency repair as soon as reasonably practical.

(d) Operating a geologic storage facility.

(1) Operating plan. The operator must maintain and comply with the approved operating plan.

(2) Operating criteria.

(A) Injection between the outermost casing protecting USDWs and the well bore is prohibited.

(B) The total volume of CO_2 injected into the storage facility must be metered through a master meter or a series of master meters. The volume and/or mass of CO_2 injected into each injection well must be metered through an individual well meter. If mass is determined using volume, the operator must provide calculations.

(C) The operator must comply with a maximum surface injection pressure limit approved by the director and specified in the permit. In approving a maximum surface injection pressure limit, the director must consider the results of well tests and, where appropriate, geomechanical or other studies that assess the risks of tensile failure and shear failure. The director must approve limits that, with a reasonable degree of certainty, will avoid initiation or propagation of fractures in the confining zone or cause otherwise non-transmissive faults or fractures transecting the confining zone to become transmissive. In no case may injection pressure cause movement of injection fluids or formation fluids in a manner that endangers USDWs. The Commission shall include in any permit it might issue a limit of 90 percent of the fracture pressure to ensure that the injection pressure does not initiate new fractures or propagate existing fractures in the injection zone(s). In no case may injection pressure initiate fractures in the confining zone(s) or cause the movement of injection or formation fluids that endangers a USDW. The director may approve a plan for controlled artificial fracturing of the injection zone.

(D) The operator must fill the annulus between the tubing and the long string casing with a corrosion inhibiting fluid approved by the director. The owner or operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the director determines that such requirement might harm the integrity of the well or endanger USDWs.

(E) The operator must install and use continuous recording devices to monitor the injection pressure, and the rate, volume, and temperature of the CO_2 stream. The operator must monitor the pressure on the annulus between the tubing and the long string casing. The operator must continuously record, continuously monitor, or control by a preset high-low pressure sensor switch the wellhead pressure of each injection well.

(F) The operator must comply with the following requirements for alarms and automatic shut-off systems.

(i) The operator must install and use alarms and automatic shut-off systems designed to alert the operator and shut-in the well when operating parameters such as annulus pressure, injection rate or other parameters diverge from permitted ranges and/or gradients. On offshore wells, the automatic shut-off systems must be installed down-hole.

(ii) If an automatic shutdown is triggered or a loss of mechanical integrity is discovered, the operator must immediately investigate and identify as expeditiously as possible the cause. If, upon investigation, the well appears to be lacking mechanical integrity, or if monitoring otherwise indicates that the well may be lacking mechanical integrity, the operator must:

(I) immediately cease injection;

(II) take all steps reasonably necessary to determine whether there may have been a release of the injected CO_2 stream into any unauthorized zone;

(III) notify the director as soon as practicable, but within 24 hours;

(IV) restore and demonstrate mechanical integrity to the satisfaction of the director prior to resuming injection; and

(V) notify the director when injection can be expected to resume.

(e) Monitoring, sampling, and testing requirements.

(1) The operator of an anthropogenic CO_2 injection well must maintain and comply with the approved monitoring, sampling, and testing plan to verify that the geologic storage facility is operating as permitted and that the injected fluids are confined to the injection zone.

(2) All permits shall include the following requirements:

(A) the proper use, maintenance, and installation of monitoring equipment or methods;

(B) monitoring including type, intervals, and frequency sufficient to yield data that are representative of the monitored activity including, when required, continuous monitoring;

(C) reporting no less frequently than as specified in §5.207 of this title (relating to Reporting and Record-Keeping).

(3) The director may require additional monitoring as necessary to support, upgrade, and improve computational modeling of the AOR evaluation and to determine compliance with the requirement that the injection activity not allow movement of fluid that would endanger USDWs.

(4) The director may require measures and actions designed to minimize and respond to risks associated with potential seismic events, including seismic monitoring.

(f) Mechanical integrity.

(1) The operator must maintain and comply with the approved mechanical integrity testing plan submitted in accordance with §5.203(j) of this title.

(2) Other than during periods of well workover in which the sealed tubing-casing annulus is of necessity disassembled for maintenance or corrective procedures, the operator must maintain mechanical integrity of the injection well at all times.

(3) The operator must either repair and successfully retest or plug a well that fails a mechanical integrity test.

(4) The director may require additional or alternative tests if the results presented by the operator do not demonstrate to the director that there is no significant leak in the casing, tubing, or packer or movement of fluid into or between formations containing USDWs resulting from the injection activity.

(g) AOR and corrective action. Notwithstanding the requirement in §5.203(d)(2)(B)(i) of this title to perform a re-evaluation of the AOR, at the frequency specified in the AOR and corrective action plan or permit, the operator of a geologic storage facility also must conduct the following whenever warranted by a material change in the monitoring and/or operational data or in the evaluation of the monitoring and operational data by the operator:

(1) a re-evaluation of the AOR by performing all of the actions specified in §5.203(d)(1)(A) - (C) of this title to delineate the AOR and identify all wells that require corrective action;

(2) identify all wells in the re-evaluated AOR that require corrective action;

(3) perform corrective action on wells requiring corrective action in the re-evaluated AOR in the same manner specified in §5.203(d)(1)(C) of this title; and

(4) submit an amended AOR and corrective action plan or demonstrate to the director through monitoring data and modeling results that no change to the AOR and corrective action plan is needed.

(h) Emergency, mitigation, and remedial response.

(1) Plan. The operator must maintain and comply with the approved emergency and remedial response plan required by §5.203(l) of this title. The operator must update the plan in accordance with §5.207(a)(2)(D)(vi) of this title (relating to Reporting and Record-Keeping). The operator must make copies of the plan available at the storage facility and at the company headquarters.

(2) Training.

(A) The operator must prepare and implement a plan to train and test each employee at the storage facility on occupational safety and emergency response procedures to the extent applicable to the employee's duties and responsibilities. The operator must make copies of the plan available at the geological storage facility. The operator must train all employees before commencing injection and storage operations at the facility. The operator must train each subsequently hired employee before that employee commences work at the storage facility.

(B) The operator must hold a safety meeting with each contractor prior to the commencement of any new contract work at a storage facility. The operator must explain emergency measures specific to the contractor's work in the contractor safety meeting.

(C) The operator must provide training schedules, training dates, and course outlines to Commission personnel annually and upon request for the purpose of Commission review to determine compliance with this paragraph.

(3) Action. If an operator obtains evidence that the injected CO_2 stream and associated pressure front may cause an endangerment to USDWs, the operator must:

(A) immediately cease injection;

(B) take all steps reasonably necessary to identify and characterize any release;

(C) notify the director as soon as practicable but within at least 24 hours; and

(D) implement the approved emergency and remedial response plan.

(4) Resumption of injection. The director may allow the operator to resume injection prior to remediation if the operator demonstrates that the injection operation will not endanger USDWs.

(i) Commission witnessing of testing and logging. The operator must provide the division with the opportunity to witness all planned well workovers, stimulation activities, other than stimulation for formation testing, and testing and logging. The operator must submit a proposed schedule of such activities to the Commission at least 30 days prior to conducting the first such activity and submit notice at least 48 hours in advance of any actual activity. Such activities shall not commence before the end of the 30 days unless authorized by the director.

(j) Well plugging. The operator of a geologic storage facility must maintain and comply with the approved well plugging plan required by §5.203(k) of this title.

(k) Post-injection storage facility care and closure.

(1) Post-injection storage facility care and closure plan.

(A) The operator of an injection well must maintain and comply with the approved post-injection storage facility care and closure plan.

(B) The operator must update the plan in accordance with §5.207(a)(2)(D)(vi) of this title. At any time during the life of the geologic sequestration project, the operator may modify and resubmit the post-injection site care and site closure plan for the director's approval within 30 days of such change. Any amendments to the post-injection site care and site closure plan must be approved by the director, be incorporated into the permit, and are subject to the permit modification requirements in §5.202 of this title (relating to Permit Required), as appropriate.

(C) Upon cessation of injection, the operator of a geologic storage facility must either submit an amended plan or demonstrate to the director through monitoring data and modeling results that no amendment to the plan is needed.

(2) Post-injection storage facility monitoring. Following cessation of injection, the operator must continue to conduct monitoring as specified in the approved plan until the director determines that the position of the CO_2 plume and pressure front are such that the geologic storage facility will not endanger USDWs.

(3) Prior to closure. Prior to authorization for storage facility closure, the operator must demonstrate to the director, based on monitoring, other site-specific data, and modeling that is reasonably consistent with site performance that no additional monitoring is needed to assure that the geologic storage facility will not endanger USDWs. The operator must demonstrate, based on the current understanding of the site, including monitoring data and/or modeling, all of the following:

(A) the estimated magnitude and extent of the facility footprint (the CO_2 plume and the area of elevated pressure);

(B) that there is no leakage of either CO_2 or displaced formation fluids that will endanger USDWs;

(C) that the injected or displaced fluids are not expected to migrate in the future in a manner that encounters a potential leakage pathway into USDWs;

(D) that the injection wells at the site completed into or through the injection zone or confining zone will be plugged and abandoned in accordance with these requirements; and

(E) any remaining facility monitoring wells will be properly plugged or are being managed by a person and in a manner approved by the director.

(4) Notice of intent for storage facility closure. The operator must notify the director in writing at least 120 days before storage facility closure. At the time of such notice, if the operator has made any changes to the original plan, the operator also must provide the revised plan. The director may approve a shorter notice period.

(5) Authorization for storage facility closure. No operator may initiate storage facility closure until the director has approved closure of the storage facility in writing. After the director has authorized storage facility closure, the operator must plug all wells in accordance with the approved plan required by §5.203(k) of this title.

(6) Storage facility closure report. Once the director has authorized storage facility closure, the operator must submit a storage facility closure report within 90 days that must thereafter be retained by the Commission in Austin. The report must include the following information:

(A) documentation of appropriate injection and monitoring well plugging. The operator must provide a copy of a survey plat that has been submitted to the Regional Administrator of Region 6 of the United States Environmental Protection Agency. The plat must indicate the location of the injection well relative to permanently surveyed benchmarks including the Latitude/Longitude or X/Y coordinates of the surface location in the NAD 27, NAD 83, or WGS 84 coordinate system, a labeled scale bar, and northerly direction arrow;

(B) documentation of appropriate notification and information to such state and local authorities as have authority over drilling activities to enable such state and local authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the injection and confining zones; and

(C) records reflecting the nature, composition, volume and mass of the CO_2 stream. If mass is determined using volume, the operator must provide calculations.

(7) Certificate of closure. Upon completion of the requirements in paragraphs (3) - (6) of this subsection, the director will issue a certificate of closure. At that time, the operator is released from the requirement in §5.205(c) of this title to maintain financial assurance.

(l) Deed notation. The operator of a geologic storage facility must record a notation on the deed to the facility property; on any other document that is normally examined during title search; or on any other document that is acceptable to the county clerk for filing in the official public records of the county that will in perpetuity provide any potential purchaser of the property the following information:

(1) a complete legal description of the affected property;

(2) that land has been used to geologically store CO_2;

(3) that the survey plat has been filed with the Commission;

(4) the address of the office of the United States Environmental Protection Agency, Region 6, to which the operator sent a copy of the survey plat; and

(5) the volume and mass of fluid injected, the injection zone or zones into which it was injected, and the period over which injection occurred. If mass is determined using volume, the operator must provide calculations.

(m) Retention of records. The operator must retain for 10 years following storage facility closure records collected during the post-injection storage facility care period. The operator must deliver the records to the director at the conclusion of the retention period, and the records must thereafter be retained at the Austin headquarters of the Commission.

(n) Signs. The operator must identify each location at which geologic storage activities take place, including each injection well, by a sign that meets the requirements specified in §3.3(1), (2), and (5) of this title (relating to Identification of Properties, Wells, and Tanks). In addition, each sign must include a telephone number where the operator or a representative of the operator can be reached 24 hours a day, seven days a week in the event of an emergency.

(o) Other permit terms and conditions.

(1) Protection of USDWs. In any permit for a geologic storage facility, the director must impose terms and conditions reasonably necessary to protect USDWs. Permits issued under this subchapter continue in effect

until revoked, modified, or terminated by the Commission. The operator must comply with each requirement set forth in this subchapter as a condition of the permit unless modified by the terms of the permit.

(2) Other conditions. The following conditions shall also be included in any permit issued under this subchapter.

(A) Duty to comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. However, the permittee need not comply with the provisions of the permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 CFR §144.34.

(B) Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(C) Duty to mitigate. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

(D) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

(E) Property rights not conveyed. The issuance of a permit does not convey property rights of any sort, or any exclusive privilege.

(F) Activities not authorized. The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

(G) Coordination with exploration. The permittee of a geologic storage well shall coordinate with any operator planning to drill through the AOR to explore for oil and gas or geothermal resources and take all reasonable steps necessary to minimize any adverse impact on the operator's ability to drill for and produce oil and gas or geothermal resources from above or below the geologic storage facility.

(H) Duty to provide information. The operator shall furnish to the Commission, within a time specified by the Commission, any information that the Commission may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit, or to determine compliance with the permit. The operator shall also furnish to the Commission, upon request, copies of records required to be kept under the conditions of the permit.

(I) Inspection and entry. The operator shall allow any member or employee of the Commission, on proper identification, to:

(i) enter upon the premises where a regulated activity is conducted or where records are kept under the conditions of the permit;

(ii) have access to and copy, during reasonable working hours, any records required to be kept under the conditions of the permit;

(iii) inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the permit; and

(iv) sample or monitor any substance or parameter for the purpose of assuring compliance with the permit or as otherwise authorized by the Texas Water Code, §27.071, or the Texas Natural Resources Code, §91.1012.

(J) Schedule of compliance: The permit may, when appropriate, specify a schedule of compliance leading to compliance with all provisions of this subchapter and Chapter 3 of this title.

(i) Any schedule of compliance shall require compliance as soon as possible, and in no case later than three years after the effective date of the permit.

(ii) If the schedule of compliance is for a duration of more than one year from the date of permit issuance, then interim requirements and completion dates (not to exceed one year) must be incorporated into the compliance schedule and permit.

(iii) Progress reports must be submitted no later than 30 days following each interim date and the final date of compliance.

Source Note: The provisions of this §5.206 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202; amended to be effective July 2, 2012, 37 TexReg 4899; amended to be effective September 19, 2022, 47 TexReg 5797

§5.207 Reporting and Record-Keeping

(a) The operator of a geologic storage facility must provide, at a minimum, the following reports to the director and retain the following information.

(1) Test records. The operator must file a complete record of all tests in duplicate with the district office within 30 days after the testing. In conducting and evaluating the tests enumerated in this subchapter or others to be allowed by the director, the operator and the director must apply methods and standards generally accepted in the industry. When the operator reports the results of mechanical integrity tests to the director, the operator must include a description of any tests and methods used. In making this evaluation, the director must review monitoring and other test data submitted since the previous evaluation.

(2) Operating reports. The operator also must include summary cumulative tables of the information required by the reports listed in this paragraph.

(A) Report within 24 hours. The operator must report to the appropriate district office the discovery of any significant pressure changes or other monitoring data that indicate the presence of leaks in the well or the lack of confinement of the injected gases to the geologic storage reservoir. Such report must be made orally as soon as practicable, but within 24 hours, following the discovery of the leak, and must be confirmed in writing within five working days.

(B) Report within 30 days. The operator must report:

(i) the results of periodic tests for mechanical integrity;

(ii) the results of any other test of the injection well conducted by the operator if required by the director; and

(iii) a description of any well workover.

(C) Semi-annual report. The operator must report:

(i) a summary of well head pressure monitoring;

(ii) changes to the source as well as the physical, chemical, and other relevant characteristics of the CO_2 stream from the proposed operating data;

(iii) monthly average, maximum and minimum values for injection pressure, flow rate, temperature, and volume and/or mass, and annular pressure;

(iv) monthly annulus fluid volume added;

(v) a description of any event that significantly exceeds operating parameters for annulus pressure or injection pressure as specified in the permit;

(vi) a description of any event that triggers a shutdown device and the response taken; and

(vii) the results of monitoring prescribed under §5.206(e) of this title (relating to Permit Standards).

(D) Annual reports. The operator must submit an annual report detailing:

(i) corrective action performed;

(ii) new wells installed and the type, location, number, and information required in §5.203(e) of this title (relating to Application Requirements);

(iii) re-calculated AOR unless the operator submits a statement signed by an appropriate company official confirming that monitoring and operational data supports the current delineation of the AOR on file with the Commission;

(iv) the updated area for which the operator has a good faith claim to the necessary and sufficient property rights to operate the geologic storage facility;

(v) tons of CO_2 injected; and

(vi) The operator must maintain and update required plans in accordance with the provisions of this subchapter.

(I) Operators must submit an annual statement, signed by an appropriate company official, confirming that the operator has:

(-a-) reviewed the monitoring and operational data that are relevant to a decision on whether to reevaluate the AOR and the monitoring and operational data that are relevant to a decision on whether to update an approved plan required by §5.203 or §5.206 of this title; and

(-b-) determined whether any updates were warranted by material change in the monitoring and operational data or in the evaluation of the monitoring and operational data by the operator.

(II) Operators must submit either the updated plan or a summary of the modifications for each plan for which an update the operator determined to be warranted pursuant to subclause (I) of this clause. The director may require submission of copies of any updated plans and/or additional information regarding whether or not updates of any particular plans are warranted.

(vii) other information as required by the permit.

(3) The director may require the revision of any required plan following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the director or whenever the director determines that such a revision is necessary to comply with the requirements of this subchapter.

(b) Report format.

(1) The operator must report the results of injection pressure and injection rate monitoring of each injection well on Form H-10, Annual Disposal/Injection Well Monitoring Report, and the results of internal

mechanical integrity testing on Form H-5, Disposal/Injection Well Pressure Test Report. Operators must submit other reports in a format acceptable to the Commission. At the discretion of the director, other formats may be accepted.

(2) The operator must submit all required reports, submittals, and notifications under this subchapter to the director and to the Environmental Protection Agency in an electronic format approved by the director.

(c) Signatories to reports.

(1) Reports. All reports required by permits and other information requested by the director, shall be signed by a person described in §5.203(a)(1)(B) of this title, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(A) the authorization is made in writing by a person described in §5.203(a)(1)(B) of this title;

(B) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility; and

(C) the written authorization is submitted to the director.

(2) Changes to authorization. If an authorization under paragraph (1) of this subsection is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (1) of this subsection must be submitted to the director prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d) Certification. All reports required by permits and other information requested by the director under this subchapter, shall be certified as follows: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(e) Record retention. The operator must retain all wellhead pressure records, metering records, and integrity test results for at least 10 years. The operator must retain all documentation of good faith claim to necessary and sufficient property rights to operate the geologic storage facility until the director issues the final certificate of closure in accordance with §5.206(k)(7) of this title.

Source Note: The provisions of this §5.207 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202; amended to be effective September 19, 2022, 47 TexReg 5797

§5.208 Penalties

(a) General. An operator that violates this subchapter may be subject to penalties and remedies specified in the Texas Natural Resources Code, Title 3, Texas Water Code, Chapter 27, and other statutes administered by the Commission.

(b) Certificate of compliance. The Commission may revoke a certificate of compliance for any oil, gas, or geothermal resource well in the manner provided in §3.73 of this title (relating to Pipeline Connection; Cancellation of Certificate of Compliance; Severance) for violation of this subchapter.

Source Note: The provisions of this §5.208 adopted to be effective December 20, 2010, 2010, 35 TexReg 11202

SUBCHAPTER C CERTIFICATION OF GEOLOGIC STORAGE OF ANTHROPOGENIC CARBON DIOXIDE (CO_2) INCIDENTAL TO ENHANCED RECOVERY OF OIL, GAS, OR GEOTHERMAL RESOURCES

§5.301 Applicability

(a) This subchapter establishes the requirements for certification of the injection, and incidental storage, of anthropogenic CO_2 into productive reservoirs for the purpose of enhanced recovery of oil, gas, or geothermal resources, and for which the operator requests certification from the Commission that the anthropogenic CO_2 is permanently stored.

(b) This subchapter applies to the injection of anthropogenic CO_2 in a reservoir in connection with enhanced recovery for which:

(1) there is a reasonable expectation of more than insignificant future production of oil, gas, or geothermal volumes or rates as a result of the injection of CO_2; and

(2) using operating pressures not anticipated to be higher than reasonably necessary to produce such production of oil, gas, or geothermal volumes and rates are covered by this rule, and the wells used in such enhanced recovery continue to be covered in accordance

with the requirements of §3.46 of this title (relating to Fluid Injection into Productive Reservoirs).

(c) For the purposes of this subsection, the CO_2 stream injected into a productive reservoir may include any proportion of anthropogenic CO_2 and naturally sourced CO_2.

(d) The operator of an enhanced recovery facility registering for certification of geologic storage of anthropogenic CO_2 incidental to enhanced recovery operations is subject to the monitoring provisions of this subchapter.

(e) No permit is required for an operator to register with, or obtain a certification from, the Commission for geologic storage of anthropogenic CO_2 incidental to enhanced recovery under this subchapter. Registration for certification by an operator under this subchapter is separate and distinct from an application for a Geologic Storage Facility under Subchapter B of this chapter (relating to Geologic Storage and Associated Injection of Anthropogenic Carbon Dioxide (CO_2)). The wells into which CO_2 is injected for the purpose of enhanced recovery continue to be covered by §3.46 of this title.

(f) Registration under this subchapter is voluntary. An enhanced recovery facility may register under this subchapter to account for geologic sequestration of anthropogenic CO_2. Additionally, this subchapter does not preclude the operator of an enhanced recovery project from opting into a regulatory program that provides carbon credit for the geologic storage of anthropogenic CO_2 incidental to enhanced recovery.

(g) An enhanced recovery facility subject to this subchapter includes all structures associated with injection and production located between the injection/production wells and the separators, but does not include the following:

(1) storage of CO_2 above ground;

(2) temporary storage of CO_2 below ground;

(3) transportation or distribution of CO_2;

(4) purification, compression, or processing of CO_2 at the surface;

(5) capture of CO_2; or

(6) CO_2 in cement, precipitated calcium carbonate, or any other technique that does not involve injection of CO_2 into the subsurface.

(h) Conflict with other requirements. If a provision of this section conflicts with any provision or term of a Commission order, field rule, or permit, the provision of such order, field rule, or permit controls.

Source Note: The provisions of this §5.301 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.302 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Anthropogenic carbon dioxide (CO_2)--Anthropogenic CO_2 as defined in the Texas Water Code, §27.002(19)(A). The term does not include naturally occurring CO_2 that is produced, acquired, recaptured, recycled, and reinjected as part of enhanced recovery. The use of the term " CO_2" in this subchapter includes anthropogenic CO_2.

(2) Anthropogenic CO_2 stream-- CO_2 that has been captured from an emission source, incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process. The term does not include any CO_2 stream that meets the definition of a hazardous waste under 40 Code of Federal Regulations Part 261.

(3) CO_2 injection well--An injection well used to inject or transmit CO_2 into an enhanced recovery reservoir.

(4) Certification--As used in this subchapter, a document issued annually by the director validating the geologic storage of anthropogenic CO_2 incidental to enhanced recovery at a facility registered under this subchapter.

(5) Enhanced recovery--Any process to displace hydrocarbons from a reservoir other than by primary recovery, including using any physical, chemical, thermal, or biological process and any co-production project. This term does not include pressure maintenance or disposal projects.

(6) Enhanced recovery facility--The underground reservoir, underground equipment, injection wells, and surface buildings and equipment and all surface and subsurface rights and appurtenances necessary to an enhanced recovery operation.

(7) Geologic storage--The incidental underground storage of CO_2 in a productive reservoir that occurs incidental to enhanced recovery.

(8) Productive reservoir--A reservoir that is productive of oil, gas and geothermal resources and for which:

(A) there is a reasonable expectation of more than insignificant future production of oil, gas or geothermal volumes or rates as a result of the injection of CO_2; and

(B) using operating pressures not anticipated to be higher than reasonably necessary to produce such production of oil, gas or geothermal volumes and rates.

Source Note: The provisions of this §5.302 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.303 Registration for Certification

(a) The operator or the proposed operator of an enhanced recovery facility for which the operator proposes to document geologic storage of anthropogenic CO_2 incidental to enhanced recovery must register with the Commission in Austin.

(1) The operator or proposed operator must include the prescribed fee with the registration application and must ensure that the registration application is executed by a party having knowledge of the facts entered on the registration.

(2) The operator or proposed operator must include with the registration application the following:

(A) the name, mailing address, and location of the facility for which the application is being submitted and the operator's name, address, telephone number, Commission Organization Report number, and ownership of the facility;

(B) a demonstration that the reservoir is undergoing enhanced recovery using injection of anthropogenic CO_2, including:

(i) the Commission field designation;

(ii) the Commission order approving such enhanced recovery project and a plat of the designated area;

(iii) a list of all injection wells permitted under §3.46 of this title (relating to Fluid Injection into Productive Reservoirs) within the enhanced recovery facility; and

(iv) information regarding the period of time for which CO_2 injection has been conducted, or is expected to be conducted, together with the total anticipated volume of anthropogenic CO_2 to be injected; and

(C) a testing, monitoring, and reporting plan.

(b) Within 90 days of receipt of a complete registration application, the director will approve or deny the registration application. If the director approves the registration application, the acknowledgment will include the conditions for certification, including conditions for monitoring and reporting.

Source Note: The provisions of this §5.303 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.304 Fees

The operator or proposed operator must remit the following non-refundable fees to the Commission with each registration application under this subchapter:

(1) a non-refundable fee of $500 for each enhanced recovery facility to be registered; and

(2) annually, a non-refundable certification fee of $10,000 for each enhanced recovery facility registered under this subchapter.

Source Note: The provisions of this §5.304 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.305 Monitoring, Sampling, and Testing Plan

An operator registering for certification under this subchapter must submit a monitoring, sampling, and testing plan to verify geologic storage of the anthropogenic CO_2 incidental to enhanced recovery.

(1) The monitoring, sampling, and testing plan must include the following:

(A) an analysis of the CO_2 stream at a frequency sufficient to yield data representative of its chemical and physical characteristics;

(B) installation of continuous monitoring devices (including digital devices to capture periodic data) to monitor injection pressure, rate of injected CO_2, and volume of injected CO_2. The operator shall perform monitoring of daily pressure on the annulus between the tubing and the long string casing by use of either continuous monitoring device or by using a pressure gauge with a rupture disk with automated alarm to signal pressures outside of the permitted operating range. The operator may remove these devices during well workovers but must reinstall them at the completion of the workover; the Commission may approve alternative methods of monitoring the annulus between the tubing and long string casing when considering injection well construction, operating pressures, and the oil and gas reservoir;

(C) demonstration of external mechanical integrity by one of the following, or another approved, method: oxygen-activation log survey, temperature log, noise log, or casing inspection log if the operator detects a problem, or once every five years, until the well is permanently plugged;

(D) corrosion monitoring of the well materials that will come into contact with water for loss of mass, thickness, cracking, pitting, and other signs of corrosion. The operator shall perform corrosion monitoring at one or more designated representative test sites typical of the enhanced recovery facility initially and quarterly, and the operator shall report quarterly, but may be modified to a less frequent schedule as approved by the Commission, based on the construction materials, operating conditions, and monitoring history that show the well components meet minimum standards and performance by:

(i) analyzing coupons of the well construction materials placed in contact with the CO_2 stream; or

(ii) routing the CO_2 stream through a closed loop constructed with the material used in the well and inspecting the material in the loop; or

(iii) using an alternative method, materials, or time period approved by the Commission;

(E) annual monitoring of the injection zone pressure in the productive reservoir, including at a minimum, at least once every five years, a shut-down of each injection well for a time sufficient to estimate reservoir pressure at the site;

(F) monitoring wells as needed for continuous monitoring for pressure changes in an appropriately porous and permeable formation above the confining zone. For each well installed, the operator must set forth the specified frequency of sampling the interval and analyzing the constituents as specified in the plan;

(G) periodic monitoring of the useable quality water strata overlying the productive reservoir to monitor for changes in quality due to CO_2 injection; and

(H) the use of indirect, geophysical techniques to determine the position of the CO_2 fluid front, or to provide other site-specific data.

(2) For an operator to make a determination by mass balancing or actual system modeling of the quantities of anthropogenic CO_2 permanently stored within the enhanced recovery reservoir for documentation to the Commission, the testing, monitoring, and reporting plan must:

(A) be based upon a site-specific assessment and may include monitoring wells or other monitoring devices to ensure that the injected anthropogenic CO_2 is confined to the productive reservoir; and

(B) include a methodology for accounting for the following:

(i) the volumes of anthropogenic CO_2 injected into the productive reservoir;

(ii) the anthropogenic CO_2 separated from the enhanced recovery production;

(iii) the anthropogenic CO_2 entrained in the production;

(iv) the volume of produced anthropogenic CO_2 recycled for injection into the reservoir;

(v) any de minimis losses of anthropogenic CO_2; and

(vi) the volume of make-up anthropogenic CO_2 injected to the enhanced recovery project.

(3) Any person registering an enhanced recovery facility under this subchapter may comply with the sampling, monitoring, and reporting requirements of this subchapter by complying with, and submitting to the Commission a copy of the information submitted to the United States Environmental Protection Agency under, Subparts RR or UU of 40 CFR Part 98, Mandatory Reporting of Greenhouse Gases: Injection and Geologic Sequestration of Carbon Dioxide.

Source Note: The provisions of this §5.305 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.306 Standards for Certification

(a) The requirements of this subchapter apply in addition to the requirements of §3.46 of this title (relating to Fluid Injection into Productive Reservoirs) and any permit conditions to which the Commission has subjected the injection wells.

(b) The operator must use a master meter or a series of master meters to meter the total volume of anthropogenic CO_2 injected into the enhanced recovery facility. The operator must use an individual well meter to meter the volume of anthropogenic CO_2 injected into each injection well. When anthropogenic CO_2 is commingled outside the enhanced recovery facility with other CO_2, the operator shall report the total volume of anthropogenic CO_2 in the mixed stream and may account for the anthropogenic CO_2 for the master meter and injected well volumes on an allocated basis.

(c) The operator must install and use continuous recording devices to monitor the injection pressure and the rate, volume, and temperature of the CO_2 stream. The operator must monitor the pressure on the annulus between the tubing and the long string casing. The operator must continuously record, continuously monitor, or control by a preset high-low pressure sensor switch the wellhead pressure of each injection well.

(d) The operator must fill the annulus between the tubing and the long string casing with a corrosion inhibiting fluid approved by the director.

(e) The operator of an injection well subject to this subchapter must maintain and comply with the approved monitoring, sampling, and testing plan to verify that the facility is operating as permitted and that the injected fluids are confined to the injection zone. The director may require additional monitoring as necessary to determine compliance with the intent of this subchapter.

(f) An operator registered under this subchapter must submit, as applicable, a description of any proposed well stimulation program and a determination that well stimulation will not compromise containment.

(g) In addition to the requirements of §3.14 of this title (relating to Plugging), the operator of an enhanced recovery facility subject to this subchapter must, prior to plugging:

(1) flush each injection well with a buffer fluid;

(2) measure to determine bottomhole reservoir pressure;

(3) perform final tests to assess mechanical integrity; and

(4) ensure that the material to be used in plugging is compatible with the CO_2 stream and the formation fluids.

(h) In any registration for geologic storage of anthropogenic CO_2 incidental to enhanced recovery, the director shall impose terms and conditions reasonably necessary to prevent the escape of CO_2.

Source Note: The provisions of this §5.306 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.307 Reporting and Recordkeeping

(a) The operator of a facility registered under this subchapter must provide, at a minimum, an annual statement, signed by an appropriate company official, confirming that the operator has complied with the requirements of this subchapter.

(b) The operator must report the results of injection pressure and injection rate monitoring of each injection well on Form H-10, Annual Disposal/Injection Well Monitoring Report, and the results of mechanical integrity testing on Form H-5, Disposal/Injection Well Pressure Test Report. Operators must submit other reports in a format acceptable to the Commission.

(c) The operator must retain all wellhead pressure records, metering records, and integrity test results for a minimum of five years.

(d) In the event the operator is unable to collect data in accordance with the approved testing, monitoring, and reporting plan, the operator shall determine the length of the specific period, such as periods of maintenance, equipment failure, or power outages, during which data were unavailable, and shall use the following procedures to estimate the data for that period.

(1) The operator shall estimate the quantity of new CO_2 transferred to the enhanced recovery facility from the supplier using the quantity of new CO_2 flow based upon the metering data.

(2) The operator shall estimate the quantity of CO_2 metered for all CO_2, except for new CO_2 transferred to the enhanced recovery facility, using the quantity of CO_2 metered under similar conditions from the nearest previous time period.

(3) The operator shall estimate the CO_2 concentration values using a concentration value under similar conditions from the nearest previous time period.

(4) The operator shall estimate values for fugitive or vented CO_2 emission volumes from surface equipment at the enhanced recovery facility using methods specified in Subpart W of the United States Environmental Protection Agency's Greenhouse Gas Reporting Rule, 40 Code of Federal Regulations, Part 98.

Source Note: The provisions of this §5.307 adopted to be effective July 17, 2011, 36 TexReg 4397

§5.308 Requirements for Certification

(a) To verify geologic storage of CO_2 incidental to enhanced recovery operations, the operator must maintain, and be in compliance with, the approved testing, monitoring, and reporting plan required by §5.305 of this subchapter (relating to Monitoring, Sampling, and Testing Plan).

(b) Annually, the Commission may issue a certification to the operator validating the geologic storage of anthropogenic CO_2 incidental to enhanced recovery at the registered facility.

(c) Certifications issued under this subchapter continue in effect until revoked, modified, or suspended by the Commission. The operator must comply with each requirement set forth in this subchapter as a condition of the certification unless modified by the terms of the certification.

Source Note: The provisions of this §5.308 adopted to be effective July 17, 2011, 36 TexReg 4397