

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

UNDERGROUND INJECTION CONTROL PERMIT CLASS VI FOR THE PERMANENT SEQUESTRATION OF CARBON DIOXIDE

Permit Number: 55294

Facility Name: Brown Pelican CO₂ Sequestration Project - ECTOR COUNTY - RRC DISTRICT 8

Wells: BRP CCS1 / BRP CCS2 / BRP CCS3

Issued to: OXY LOW CARBON VENTURES, LLC

NOTICE: THIS IS NOT AN AREA-WIDE PERMIT

Pursuant to the Texas Water Code, Chapter 27, the Texas Natural Resources Chapter 91, and Underground Injection Control (UIC) regulations of the Railroad Commission of Texas – Oil & Gas Division (hereafter RRC), codified at Title 16, Part 1, Chapter 5 of the Texas Administrative Code (TAC) Subchapters A and B, §5.101, §5.102, §5.201, §5.202, §5.203, §5.204, §5.205, §5.206, §5.207, and §5.208

Oxy Low Carbon Ventures, LLC of Houston, TX

hereinafter, the permittee, is hereby authorized to construct and operate a Class VI UIC facility comprising a permanent carbon dioxide (CO₂) sequestration reservoir in the Permian Lower San Andres Formation with three Class VI UIC wells, located in its entirety on the Shoe Bar Ranch approximately 20 miles southwest of Odessa, Texas in Ector County as part of the Oxy Low Carbon Ventures Brown Pelican CO₂ Sequestration Project. The three wells proposed for this carbon sequestration facility will inject a carbon dioxide stream sourced from the Oxy Low Carbon Ventures / 1PointFive Stratos Direct Air Capture facility at or near the surface location of the Oxy Low Carbon Ventures Brown Pelican CO₂ Sequestration Facility in Ector County. The proposed surface locations of the three Oxy Low Carbon Ventures Brown Pelican CO₂ Sequestration Project Class VI UIC wells are as follows:

1. BRP CCS1: Latitude: 31.76479314 / Longitude: -102.7289311
2. BRP CCS2: Latitude: 31.76993805 / Longitude: -102.7332448
3. BRP CCS3: Latitude: 31.76031163 / Longitude: -102.7101566

The carbon dioxide stream, as characterized in the permit application and the administrative record, shall be a liquid, supercritical fluid, or gas. Injection is authorized into the Permian San Andres Formation at depths between approximately 4,500 – 5,100 feet below ground surface upon the express condition that the permittee meets the restrictions set forth herein. The designated confining zone for this injection reservoir is the Upper San Andres and Grayburg Formations.

This permit is for the construction and operation of one Class VI underground sequestration facility consisting of the three wells listed above, which will be authorized under separate Form W-1, Application for Permit to Drill, Recomplete, or Re-Enter, drilling permits also issued by the Railroad Commission of Texas.

Injection shall not commence until the operator has received written authorization from the Director of the RRC Class VI UIC Program, in accordance with Section S of this permit.

All references to Title 16, Part 1, Chapter 5 of the Texas Administrative Code (TAC) Subchapters A and B, §5.101, §5.102, §5.201, §5.202, §5.203, §5.204, §5.205, §5.206, §5.207, and §5.208, are to all regulations that are in effect on the date that this permit is effective. The following attachments are incorporated into this permit as enforceable conditions:

- A. AREA OF REVIEW AND CORRECTIVE ACTION PLAN
- B. INJECTION WELL CONSTRUCTION PLAN
- C. INJECTION WELL STIMULATION PLAN
- D. PRE-INJECTION / PRE-OPERATIONAL TESTING PLAN
- E. INJECTION WELL OPERATING CONDITIONS: CCS1, CCS2, & CCS3
- F. TESTING AND MONITORING PLAN
- G. INJECTION WELL PLUGGING PLAN
- H. EMERGENCY AND REMEDIAL RESPONSE PLAN
- I. POST-INJECTION SITE CARE AND SITE CLOSURE PLAN
- J. FINANCIAL RESPONSIBILITY DEMONSTRATION

This permit shall become effective on [Insert date], and shall remain in full force and effect during the operating life of the three wells listed above and the post-injection site care period until site closure is authorized and completed, unless this permit is revoked and reissued, terminated, or modified pursuant to 16 TAC §5.202(d), §5.202(d)(2)(B), or §5.202(d)(2)(A)(viii). The permit will expire in two years from its effective date if the permittee fails to commence well construction, unless a written request in an electronic format for an extension of this two-year period has been approved by the Director. Requests for extension shall state delay causality, an estimated well completion date, and list any additional wells that penetrate the designated confining zone within the area of review (AOR) which were not included in the initial permit application, including well construction diagrams, cement records, and cement bond logs for any new AOR wells. A maximum of two, one-year extensions are allowed. If the construction of the well has not commenced during the maximum period of three years from the effective date, the permit expires and may not be extended. The permittee may request an expiration date sooner than the one-year period, provided no construction on the wells has commenced. At least every five years from the effective date specified above, the permittee shall re-evaluate the Area of Review and comply with 16 TAC §5.206(g).

If results from the re-evaluated Area of Review are different from what is predicted in Attachment A of this permit, the Texas RRC may require the permittee to update the permit and the attachments.

APPROVED AND ISSUED ON [Insert Date].

Phillip Warren, P.E.
Special Injection Permits Manager

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PERMIT CONDITIONS

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. Notwithstanding any other provisions of this permit, the permittee authorized by this permit shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of injection, annulus, or formation fluids into underground sources of drinking water (USDWs) or any unauthorized geologic zones. The objective of this permit is to prevent the movement of fluids into or between USDWs or into any unauthorized geologic zones consistent with the requirements at 16 TAC §5.203(e)(1) and §5.203(d)(1)(C) and §5.203(j). Any underground injection activity not specifically authorized in this permit is prohibited. For purposes of enforcement, compliance with this permit during its term constitutes compliance with Texas Water Code, Chapter 27, and the Texas Natural Resources Code, Chapter 91. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulations. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable regulations.

B. PERMIT ACTIONS

1. **Modification, Revocation and Reissuance, and Termination** – The Director of the RRC Class VI UIC Program, hereinafter, the Director, may, for cause or upon request from any interested person, including the permittee, modify, revoke and reissue, or terminate this permit in accordance with 16 TAC §5.202, §5.203(d)(1)(C), §5.203(e)(1), §5.203, and §5.202(d)(2)(A)(vi). The permit is also subject to minor modifications for cause as specified in 16 TAC §5.202(d)(2)(A)(viii). The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.
2. **Minor Modifications** – Upon the consent of the permittee, the Director may modify a permit to make the corrections or allowances for minor changes in the permitted activity as listed in 16 TAC §5.202(d)(2)(A)(viii). Any permit modification not processed as a minor modification under 16 TAC §5.202(d)(2)(A)(viii) shall be made for cause, and with a draft permit and public notice as required in 16 TAC §5.204.
3. **Transfer of Permits** – This permit is not transferable to any person except in accordance with 16 TAC §5.202(c) and Section O(7)(b) of this permit.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with the Texas Public Information Act, Texas Government Code, Chapter 552, any information submitted to the RRC pursuant to this permit may be claimed as confidential business information by the submitter. Any such claim shall be asserted at the time of submission by clearly identifying each page with the words "confidential business information" on every page containing such information. If no claim is made at the time of submission, the RRC may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in the Texas Public Information Act, Texas Government Code, Chapter 552. Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee; and
2. Information which deals with the existence, absence, or level of contaminants in drinking water.

E. DEFINITIONS

All terms used in this permit shall have the meaning set forth in the Texas Water Code, Chapter 27, or the Texas Natural Resources Code, Chapter 91, and the RRC’s UIC regulations specified at 16 TAC §5.206. Unless specifically stated otherwise, all references to “days” in this permit should be interpreted as calendar days.

F. DUTIES AND REQUIREMENTS

1. **Prohibition of Movement of Fluid into a USDW** – The permittee shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of a fluid containing any contaminant into USDWs. If any water quality monitoring of a USDW indicates the movement of any contaminant into the USDW, the Director may take enforcement action or prescribe such additional requirements for construction, corrective action (including closure of the injection well), operation, monitoring, or reporting as are necessary to remediate and prevent such movement.
2. **Duty to Comply** – The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of 16 TAC §5.206(o)(A) and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application.

3. **Duty to Reapply** – If the permittee wishes to continue an activity regulated by this permit after its expiration, the permittee shall apply for and obtain a new permit.
4. **Penalties for Violations of Permit Conditions** – Any person who violates a permit requirement is subject to civil and/or criminal penalties and other enforcement action under the Texas Natural Resources Code, Section 91.143. Any person who willfully violates permit conditions may be subject to criminal prosecution under the Texas Natural Resources Code, Section 91.143 and other applicable statutes and regulations.
5. **Need to Halt or Reduce Activity Not a Defense** – It shall not be a defense for the permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
6. **Duty to Mitigate** – The permittee shall take all timely and reasonable steps necessary to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
7. **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 include, among other things, 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 this permit.
8. **Duty to Provide Information** – The permittee shall furnish to the Director in electronic format, within the time specified by the type of submittal or as defined by the Director, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit or the UIC regulations. The permittee shall also furnish to the Director, upon request within a time specified, electronic copies of records required to be kept by this permit. The permittee shall also comply with all reporting requirements of this permit, and as required by 16 TAC §5.203(a)(1)(B).
9. **Inspection and Entry** – The permittee shall allow the Director or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
 - (a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where electronic or non-electronic records are kept under the conditions of this permit;

- (b) Have access to and copy, at reasonable times, any electronic or non-electronic records that are kept under the conditions of this permit;
- (c) Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- (d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Texas Water Code, Chapter 27, or the Texas Natural Resources Code, Chapter 91, any substances or parameters at any location, including facilities, equipment or operations regulated or required under this permit.

10. **Signatory and Certification Requirements** – All reports, notifications, or any other information, required to be submitted by this permit or requested by the Director shall be signed and certified in accordance with 16 TAC §5.203(a)(1)(B).

G. AREA OF REVIEW AND CORRECTIVE ACTION

1. The Area of Review (AoR) is the area surrounding the injection well where USDWs may be endangered by the injection activity. The area of review was delineated using computational modeling that accounts for the physical and chemical properties of all phases of the injected carbon dioxide stream and is based on available site characterization, monitoring, and operational data. The permittee shall maintain and comply with the approved AoR and Corrective Action Plan (CAP) included as Attachment A, which is an enforceable condition of this permit, and shall meet the requirements of 16 TAC §5.206(g).
2. As documented in Attachment A, three (3) wellbore penetrations within the AoR require plugging because these wellbores penetrate the injection zone or confining layer and will not be used for injection or monitoring within the Brown Pelican CO₂ Sequestration Project. The wells are required to be properly plugged and abandoned.
 - (a) The Eidson E-1 well (API No. 4213531130) must be plugged before December 31, 2025, following the re-entry and plugging procedures documented in the AoR and Corrective Action Plan (Attachment A);
 - (b) The Scharbauer Eidson-1 well (API No. 4213510667) must be plugged before December 31, 2027, following the re-entry and plugging procedures documented in the AoR and Corrective Action Plan (Attachment A); and
 - (c) Eidson-Scharbauer-1 (API No. 4213506139) wells must be plugged before December 31, 2027, following the re-entry and plugging procedures documented in the AoR and Corrective Action Plan (Attachment A).

3. At least sixty (60) days prior to commencing corrective action, the permittee shall notify the Director. As corrective action activities are completed, the permittee shall provide periodic updates, including plugging reports, to the Director.
4. Every five (5) years as specified in the AoR and CAP, or more frequently when monitoring and operational conditions warrant, the permittee shall reevaluate the AoR and perform corrective action in the manner specified in 16 TAC §5.206(g) and update the AoR and CAP or demonstrate to the Director that no update is needed. Reevaluation of the AoR and CAP shall meet the requirements of 16 TAC §5.203(d)(1)(A) - (C) and shall include a new survey of wells within the existing or modified AoR.
5. Following each AoR reevaluation or a demonstration that no evaluation is needed, the permittee shall submit a report of the resultant information in an electronic format to the Director for review and approval. Once approved by the Director, the revised AoR and CAP will become an enforceable condition of this permit.

H. FINANCIAL RESPONSIBILITY

The permittee shall maintain financial responsibility and resources to meet the requirements of 16 TAC §5.205 for the life of this permit and through all phases of the project. The permittee must maintain financial responsibility until site closure is authorized by the Director as described in Section P of this permit. The permittee shall use financial instruments as listed in 16 TAC §5.205(c)(2)(D) to cover all costs associated with the requirements of this permit. The approved financial responsibility and estimated costs for this permit are found in Attachment J and in the administrative record of this permit.

1. **Costs to be Covered** – The financial instrument(s) shall be sufficient to cover the cost of:
 - (a) Corrective action (that meets the requirements of 16 TAC §5.203(d)(2);
 - (b) Injection well plugging (that meets the requirements of 16 TAC §5.203(k);
 - (c) Post injection site care and site closure (that meets the requirements of 16 TAC §5.206(j);
 - (d) Emergency and remedial response (that meets the requirements of 16 TAC §5.203(n).
2. **Cost Estimate Updates and Adjustments** – A detailed written estimate for each phase is included in Attachment J of this permit. The cost estimates must be performed for each phase separately and must be based on the costs to the Commission of hiring a third party to perform

the required activities (a third party is a party who is not within the corporate structure of the owner or operator) and shall be approved by the Director per 16 TAC §5.205(c)(2)(i).

- (a) During the life of this permit, the permittee shall adjust the cost estimate for annual inflation and any amendments made to the Project Plans included as Attachments A-J of this permit, which address costs associated with items (a) through (d) in Section H(1) of this permit. The permittee shall adjust cost estimates annually at least 60 days prior to the anniversary date of the establishment of the financial instrument(s) and provide this adjustment to the Director in an electronic format. All cost and Project Plan adjustments are subject to the Director's approval.
- (b) 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 owner or 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

3. **Notification** –

- (a) Whenever a cost estimate increases to an amount greater than the face amount of a controlling financial instrument, the permittee, at least 60 days after the increase, shall either cause the face amount to be increased to an amount at least equal to the current cost estimate and submit evidence of such increase to the Director, or obtain other financial responsibility instruments to cover the increase. Whenever a current cost estimate decreases to an amount less than the face amount of a controlling financial instrument, the face amount of the financial assurance instrument may be reduced to the amount of the current cost estimate only after the permittee has received written approval from the Director.
- (c) The permittee shall notify the Director by certified mail and in an electronic format of adverse financial conditions, such as bankruptcy, that may affect the ability to carry out injection well plugging, post-injection site care and site closure, and any applicable ongoing actions under Corrective Action and/or Emergency and Remedial Response. Such notice shall be provided to the RRC's Office of General Counsel and to the Director.
 - (i) In the event that the permittee or the third-party provider of a financial responsibility instrument (surety bond or letter of credit) is going through a bankruptcy, the permittee shall notify the Director by certified mail and in an electronic format of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy),

U.S. Code, naming the permittee as debtor, within 10 days after commencement of the proceeding.

- (iii) A permittee who fulfills the requirements Section H and Attachment J of this section by obtaining a surety bond or letter of credit, will be deemed to be without the required financial assurance in the event of bankruptcy of the trustee or issuing institution, or a suspension or revocation of the authority of the trustee institution to act as trustee of the institution issuing the surety bond or letter of credit.

4. **Establishing Other Coverage** – The permittee shall establish other financial assurance or liability coverage acceptable to the Director, within 60 days of the occurrence of the events in Section H(2), H(3), or H(4) of this permit.

I. WELL CONSTRUCTION

The design and specifications for the injection well, injection zone monitoring wells, confining zone monitoring wells, and the groundwater monitoring wells are included in Attachment B of this permit.

1. **Injection Well Construction** – The wells shall be constructed in accordance with 16 TAC §3.13 and 16 TAC §5.203(e)(1). The design and construction shall allow continuous monitoring of the annulus between the long string casing and the injection tubing and accommodate testing devices and workover tools. During construction, the permittee may make changes to the design of the injection well consistent with the conditions of this permit. If changes are made to the design of the well, notification shall be made to the Director and the construction changes shall be provided for review and approval by the Director before installation. Once the construction of the well is completed, and prior to authorization to inject, the permittee shall submit the final, as-built construction specifications and diagrams within 30 days for review and approval by the Director. Any deviations from the proposed design and as-built construction of the well shall be noted. If the changes in well design are significant, the Director may require this permit to be modified.
2. **Siting** – The permittee has demonstrated to the satisfaction of the Director that the well is in an area with suitable geology in accordance with the requirements at 16 TAC §206(a)(5).
3. **Casing and Cementing** – The wells shall be cased and cemented per 16 TAC §3.13 and 16 TAC §5.203(e)(1)(B). Casing, cement, or other materials used in the construction of the well shall have sufficient structural strength for the life of the geologic sequestration project. All well materials shall be compatible with all fluids with which the materials may be expected to come into contact and shall meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Director. The casing and cementing program shall prevent the movement of fluids into or between USDWs for the expected life of the

well in accordance with 16 TAC §5.203(e)(1)(B). The casing and cement used in the construction of this well are shown in Attachment B of this permit and in the administrative record for this permit. Any changes shall be submitted in an electronic format for approval by the Director before installation.

4. **Tubing and Packer Specifications** – The tubing and packer design shall meet the requirements of 16 TAC §3.13 and 16 TAC §5.203(e). Tubing and packer materials used in the construction of the well shall be compatible with fluids with which the materials may be expected to come into contact and shall meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Director. Injection shall only take place through the tubing, with a packer set in the long string casing within or below the nearest cemented and impermeable confining system no more than 100 feet above the injection zone. The tubing and packer used in the well are represented in engineering drawings contained in Attachment B of this permit. Any change shall be submitted in an electronic format for review and approval by the Director before installation.
5. **Sampling and Monitoring Devices** – The permittee shall install and maintain in good condition all devices required to measure, monitor, and record the data required by Attachment F of this permit. The permittee shall ensure that the devices installed and methods used are sufficient to represent the activity being measured, monitored, or recorded. Calculated flow data or periodic monitoring are not acceptable for required continuous monitoring except as a back-up system if the primary continuous monitoring devices become inoperable. The Director shall be notified of such occurrences, and continuous monitoring devices should be repaired or replaced as soon as practicable. If this period of time is extensive in the opinion of the Director, injection activities shall cease until such time that normal monitoring is restored. The permittee shall ensure the wells' construction and near-wellhead design is appropriate for the collecting of samples and fulfilling of all monitoring requirements of this permit. The permittee shall ensure all gauges used for monitoring and testing are properly calibrated.
6. **Monitoring Well Construction**– 16 TAC §5.203(j)(2)(D)(i), §5.203(j)(2)(D)(ii), §5.203(j)(2)(E), and §5.203(j)(2)(G) require monitoring of the carbon dioxide plume and pressure front of the confining and injection zones and monitoring of groundwater located above the injection zone. These sections are incorporated by reference into this permit. Groundwater, confining zone, and injection zone monitoring wells shall be constructed in the manner depicted in Attachment B of this permit using materials that are compatible with the injected fluids. All monitoring wells shall be constructed in a manner to provide representative samples that can be analyzed for the monitoring parameters required by this permit. Once the construction of the monitoring wells has been completed, the as-built construction diagrams shall be included in the Pre-injection Testing Report to be submitted to the Director per Section J of this permit.

J. PRE-INJECTION TESTING

Testing is required during the construction of the well per 16 TAC §5.203(f). This testing is required to verify the geology of the well site to ensure compliance with the well construction requirements per 16 TAC §203(e) and to test viability of the wells to meet the stipulated operational requirements. All testing shall be conducted in accordance with 16 TAC §5.203(f). The pre-injection testing plan is included as Attachment D of this permit.

1. Prior to the Director authorizing injection, the permittee shall perform all pre-injection logging, sampling, and testing specified at 16 TAC §5.203(f) This testing shall include:
 - (a) Logs, surveys and tests to determine or verify the depth, thickness, porosity, permeability, lithology, and formation fluid salinity in all relevant geologic formations. These tests shall include:
 - (i) Deviation checks that meet the requirements of 16 TAC § 5.203 (f)(1)(A);
 - (ii) Logs and tests before and upon installation of the surface casing that meet the requirements of 16 TAC §5.203 (f)(1)(D);
 - (iii) Logs and tests before and upon installation of the long-string casing that meet the requirements of 16 TAC §5.203 (f)(1)(D);
 - (iv) Tests to demonstrate internal and external mechanical integrity that meet the requirements of 16 TAC §5.203 (h) and
 - (v) Any alternative methods, provided that the type of test has the written approval of the Administrator pursuant to requirements at 16 TAC §5.203(h)(2)(E).
 - (b) Whole cores or sidewall cores of the injection zone and confining system and formation fluid samples from the injection zone that meet the requirements of 16 TAC §5.203(f)(3)
 - (c) Documentation of the measured fluid temperature, pH, conductivity, reservoir pressure, and static fluid level of the injection zone that meet the requirements of 16 TAC §5.203(f)(3)(A).
 - (d) Tests to determine well-specific data regarding the injection and confining zones. These tests shall determine fracture pressure and the physical and chemical characteristics of the injection and confining zones and the formation fluids in the injection zone that meet the requirements of 16 TAC §5.203(f)(2)(C) and §5.203(f)(3)(B)

(e) Tests to verify hydrogeologic characteristics of the injection zone that meet the requirements of 16 TAC §5.203(f)(2), including:

- (i) A pressure fall-off test; and
- (ii) A pumping test or injectivity tests.

2. The permittee shall submit to the Director for approval in an electronic format a schedule for pre-operational testing activities 30 days prior to conducting the first test and submit any changes to the schedule 30 days prior to the next scheduled test. The permittee shall provide the Director with the opportunity to witness all logging, sampling, and testing required under this permit.

K. INJECTION WELL OPERATING REQUIREMENTS

1. **Outermost Casing Injection Prohibition:** Injection between the outermost casing protecting USDWs and the well bore is prohibited.
2. **Injection Fluids / Carbon Dioxide Sources** - The permittee will capture carbon dioxide from one source during the life of the permit for injection into the Class VI wells. The source of carbon dioxide approved for injection is the Stratos Direct Air Capture facility (see Attachment E). The permittee may propose additional sources of carbon dioxide for injection, subject to review and approval by the Director, as described in Section N of this permit.
3. **Injection Pressure Limitation** – Except during stimulation, the permittee shall ensure that injection pressure does not exceed 90 percent of the fracture pressure of the injection zone(s) to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone(s). Under no circumstance shall injection pressure initiate fractures or propagate existing fractures in the confining zone or cause the movement of injection or formation fluids into a USDW. The maximum injection pressure limit is listed in Attachment E of this permit.
4. **Stimulation Program** –All stimulation activities shall be approved by the Director prior to conducting the stimulation. The permittee shall carry out the Stimulation Program in accordance with Attachment C of this permit.
4. **Additional Injection Limitations** – No injection fluid other than that identified on Page 1 of this permit may be injected except fluids used for stimulation, rework, and well tests as approved by the Director. Injection shall occur within the injection tubing.
5. **Annulus Fluid** – The permittee shall fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the Director.

6. **Annulus/Tubing Pressure Differential** – Except during workovers or times of annulus maintenance, the permittee shall maintain pressure on the annulus that exceeds the operating injection pressure as specified in Attachment E of this permit, unless the Director determines that such requirement might harm the integrity of the well or endanger USDWs.

7. **Automatic Alarms and Automatic Shut-off System** –

(a) The permittee shall:

(i) Install, continuously operate, and maintain an automatic alarm and automatic shut-off system or, at the discretion of the Director, down-hole shut-off systems, or other mechanical devices that provide equivalent protection; and

(ii) Successfully demonstrate the functionality of the alarm system and shut-off system prior to the Director authorizing injection, and at a minimum of once every twelfth month after the last approved demonstration.

(iii) Establish well-specific thresholds for activating the shut-off system and submit revised Attachments E & H.

(b) Testing under this Section shall involve subjecting the system to simulated failure conditions and shall be witnessed by the Director or the Director's representative unless the Director authorizes an unwitnessed test in advance. The permittee shall provide notice in an electronic format at least 30 days prior to running the test and shall provide the Director or the Director's representative the opportunity to witness the test. The test shall be documented using either a mechanical or digital device which records the value of the parameter of interest, or by a service company job record. A final report including any additional interpretation necessary for evaluation of the testing shall be submitted to the Director in an electronic format within the time period specified in Section O(4) of this permit.

8. **Precautions to Prevent Well Blowouts** – Except at specific times as approved by the Director, the permittee shall maintain on the well a pressure which will prevent the return of the injection fluid to the surface. The wellbore shall be filled with a fluid of sufficient specific gravity during workovers to maintain a positive (downward) pressure gradient and/or a plug shall be installed which can resist the pressure differential. A blowout preventer shall be installed and kept in proper operational condition whenever the wellhead is removed to work on the well. The permittee shall follow procedures such as those below to assure that a backflow or blowout does not occur:

(a) Limit the temperature and/or corrosivity of the injectate; and

(b) Develop procedures necessary to assure that pressure imbalances do not occur.

9. **Circumstances Under Which Injection Shall Cease** –

Injection shall cease when any of the following circumstances arises:

- (a) Failure of the well to pass a mechanical integrity test;
- (b) A loss of mechanical integrity during operation;
- (c) The automatic alarm or automatic shut-off system is triggered;
- (d) A significant unexpected change in the annulus or injection pressure;
 - 1. The Director determines that the well lacks mechanical integrity;
 - 2. Movement of injection or formation fluids into a USDW is detected;
 - 3. Conditions described in Section M(C)(3), Seismic Event Response, occur;
 - 4. The Director determines the site is no longer suitable for injection based on new information;
 - 5. The Director determines that the permittee is unable to maintain compliance with any condition of this permit or regulatory requirement, and the Director determines that injection should cease.

10. **Approaches for Ceasing Injection** -

- (a) In all instances where injection ceases, the permittee shall immediately cease injection and shut-in the well as outlined in the Emergency and Remedial Response Plan (Attachment H of this permit), and the Permittee must get approval from the Director to resume injection.
- (b) If an automatic shutdown (i.e., down-hole or at the surface) is triggered, the Permittee must immediately investigate and identify the cause of the shutdown as expeditiously as possible. If, upon investigation, the well appears to lack mechanical integrity, or if the required monitoring of data from continuous recording devices or automatic shutoff systems indicates that the well may lack mechanical integrity, the Permittee must take the actions listed below in Section L of this Permit.

L. MECHANICAL INTEGRITY

The injection wells shall maintain internal (casing, tubing and packer) and external (fluid movement into geologic units other than the injection zone) mechanical integrity for the entirety of its operational life. No significant leaks in the casing, tubing, or packer can occur without corrective actions. The determination of whether the injection well has mechanical integrity is at the discretion of the Director. Mechanical integrity is determined through testing and test procedures approved by the Director. Approved mechanical integrity testing procedures are in the Testing and Monitoring Plan in Attachment F of this permit. Other tests and/or procedures not listed in this plan will be considered by the Director for approval.

1. **Standards** – Other than during periods of well workover (repair or maintenance) approved by the Director in which the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the injection well shall have and maintain mechanical integrity consistent with 16 TAC §5.203(h). To meet these requirements, mechanical integrity tests/demonstrations shall be witnessed by the Director or an authorized representative of the Director unless prior approval has been granted by the Director to run an un-witnessed test. In order to conduct testing without a RRC representative, the following procedures shall be followed.
 - (a) The permittee shall submit prior notification in an electronic format at least 30 days prior to testing, including the information that no RRC representative is available, and receive permission from the Director to proceed;
 - (b) The test shall be performed in accordance with the Testing and Monitoring Plan (Attachment F of this permit) and documented using either a mechanical or digital device that records the value of the parameter of interest; and
 - (c) A final report including any additional interpretation necessary for evaluation of the testing shall be submitted in an electronic format within the time period specified in Section O(4) of this permit.
2. **Mechanical Integrity Testing** – The permittee shall conduct a casing inspection log and mechanical integrity testing (MIT) as follows:
 - (a) After construction, and prior to receiving authorization to inject from the Director, the permittee shall demonstrate internal mechanical integrity of the well. This demonstration is achieved by the performance of the following testing pursuant to 16 Texas Administrative Code §5.203(h)(2):
 - (i) A pressure test with liquid or gas; and
 - (ii) A casing inspection log; or

- (iii) An alternative approved by the Director that has been approved by the Administrator pursuant to requirements at 16 TAC §5.203(h)(2)(e).
- (b) Prior to receiving authorization to inject, the permittee shall perform the following testing to demonstrate external mechanical integrity pursuant to 16 TAC §5.203(h)(2):
 - (i) Tracer surveys such as an oxygen activation log; or
 - (ii) Temperature or noise logs; or
 - (iii) An alternative approved by the Director that has been approved by the Administrator pursuant to requirements at 16 Texas Administrative Code §5.203 (h)(2)(E).
- (c) Other than during periods of well workover (repair or maintenance) approved by the Director, in which the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the permittee shall continuously monitor injection pressure, injection rate, injection mass, pressure on the annulus between tubing and long string casing, and annulus fluid volume as specified in 16 Texas Administrative Code §5.206(e)(2) and §5.203(h)(1)(C)
- (d) At least once per year, the permittee shall perform the testing to demonstrate external mechanical integrity pursuant to 16 TAC §5.203(h)(1)(C) and as listed in Section L(2)(b) of this permit. All test data shall be sent to SIP@rrc.texas.gov.
- (e) After any well repair or workover that may compromise the internal mechanical integrity of the well, the internal mechanical integrity of the well shall be demonstrated by conducting test(s) approved by the Director. In cases where a well has lost mechanical integrity, written approval by the Director is required before injection can resume. All test data shall be sent to SIP@rrc.texas.gov.
- (f) Prior to plugging the well, the permittee shall demonstrate external mechanical integrity as described in the Injection Well Plugging Plan and that meets the requirements of 16 TAC §5.203(k). All test data shall be sent to SIP@rrc.texas.gov. Written approval by the Director is required before plugging operations may commence.
- (g) The Director may require the use of other tests to demonstrate mechanical integrity other than those listed above, provided that the type of test has the written approval of the Administrator pursuant to requirements at 16 TAC §5.203(h)(2)(E). All test data shall be sent to SIP@rrc.texas.gov.

3. Prior Notice, MIT Procedures and Reporting –

- (a) The permittee shall notify the Director in an electronic format of intent to demonstrate mechanical integrity at least 30 days prior to such demonstration. At the discretion of the Director a shorter time period may be allowed.
- (b) The mechanical integrity tests and procedures are listed in Attachments D and F. Use of non-approved tests and procedures may result in disqualification of the tests.
- (c) Reports of mechanical integrity demonstrations which include logs shall include an interpretation of results by a knowledgeable log analyst. The permittee shall report in an electronic format the results of a mechanical integrity demonstration within 30 days of the testing.

4. **Gauge and Meter Calibration** – Prior to testing, the permittee shall calibrate all gauges used in mechanical integrity demonstrations and other monitoring required by this permit. All equipment shall read to an accuracy of not less than 0.5 percent of full scale. All equipment shall be calibrated in the manner and frequency recommended by the manufacturer and at least within one year prior to each required test. The date of the most recent calibration shall be noted on or near the gauge or meter. A copy of the calibration certificate shall be submitted to the Director in an electronic format with the report of the test. Pressure gauge resolution shall be no greater than five (5) psi. Certain mechanical integrity and other testing may require greater accuracy and shall be identified in the procedure submitted to the Director prior to the test.

5. Loss of Mechanical Integrity –

- (a) If the permittee or the Director finds that a well fails to demonstrate mechanical integrity during a test, or fails to maintain mechanical integrity during operation, or that a loss of mechanical integrity as defined by 16 TAC §5.102(31) is suspected during operation (such as a significant unexpected change in the annulus or injection pressure), the permittee shall:
 - (i) Cease injection in accordance with Section K(9), and Attachments E or H of this permit;
 - (ii) Take all steps reasonably necessary to determine whether there may have been a release of the injected carbon dioxide stream or formation fluids into any unauthorized zone. If there is evidence of potential USDW endangerment, the Emergency and Remedial Response Plan shall be implemented (Attachment H of this permit);
 - (iii) Follow the reporting requirements as directed in Section O of this permit;
 - (iv) Restore and demonstrate mechanical integrity to the satisfaction of the Director and receive written approval from the Director prior to resuming injection; and
 - (v) Notify the Director in an electronic format when injection can be expected to resume.

- (b) If an automatic shutdown (*i.e.*, downhole or at the surface) is triggered, the permittee shall immediately investigate and identify as expeditiously as possible the cause of the shutdown. If, upon investigation, the well appears to be lacking mechanical integrity, or if the required monitoring indicates that the well may be lacking mechanical integrity, the permittee shall take the actions listed above in Section L(5)(a)(i) through (v).
- (c) If the well loses mechanical integrity prior to the next scheduled test date, then the well shall either be plugged or repaired and retested within 30 days of losing mechanical integrity. The permittee shall not resume injection until mechanical integrity is demonstrated and the Director gives written approval to resume injection in cases where the well has lost mechanical integrity.

6. **Mechanical Integrity for Confining Zone, Injection Zone, and Groundwater Monitoring Wells** – All monitoring wells shall maintain internal and external mechanical integrity for the entirety of their operational life. No significant leaks in the casing can occur and require corrective actions. The determination of whether the monitoring well has mechanical integrity is at the discretion of the Director. Mechanical integrity is determined through testing and test procedures approved by the Director. Mechanical integrity tests and procedure for the confining zone and injection zone monitoring wells are outlined in the Testing and Monitoring Plan in Attachment F of this permit. Mechanical integrity testing for groundwater monitoring wells shall consist of periodic televising of the well casing. Testing and demonstration of monitoring wells shall be conducted on the same schedule as the injection well. Other tests and/or procedures not listed in this plan will be considered by the Director for approval.

7. **Mechanical Integrity Testing on Request from Director** – The permittee shall demonstrate mechanical integrity at any time upon written notification from the Director.

M. SEISMIC EVENT RESPONSE

1. Seismic Monitoring.

- (a) Prior to commencing injection, the permittee must deploy and maintain a seismic monitoring system to determine the presence or absence, magnitude, and hypocenter location, of any induced seismic activity of magnitude 1.8 M or above. If, after injection start-up and a subsequent period of sustained injection by all planned injection wells at the maximum permitted rates, the permittee can demonstrate that permanent seismic monitoring is not needed for this project, the Commission may allow the local seismic monitoring to be discontinued and defer instead to state (TexNet) and/or national (USGS) arrays for long-term monitoring.
- (b) The system shall be designed with surface monitors and/or downhole monitors as required to meet minimum magnitude of completeness (M_c) of 1.8 M or an alternative site-appropriate

minimum magnitude approved by the Director in consultation with the State Seismologist, and to appropriately calibrate event magnitudes and hypocentral locations. The system shall be calibrated with check-shots, sonic logs, or other local velocity information, preferably at depth.

- (c) The permittee shall analyze seismic and other relevant data to determine whether the risk of triggering an earthquake of magnitude 3.5 or greater is significantly increased by injection. If, after analysis of seismic and other relevant data, the permittee determines that there is such an increase in risk, the permittee shall notify the Director immediately, and submit to the Director a mitigation plan for the Director's review within 15 days of that determination. The permittee shall implement the plan as approved by the Director.

The appropriate response to seismic events depends on the Magnitude (M) of the seismic event according to the following protocol:

2. **Seismic events not recorded or M less than 2.0** - Continue normal operations.
3. **Seismic events with M equal to or greater than 2.0 but less than 3.5** - The permittee shall notify the Director (District Director or Technical Permitting Director) of any such event within 24 hours, providing information on the status of the injection site. If the annulus pressure of the well decreases below the set alarm, injection operations shall cease. In that situation, within 30 days the permittee shall evaluate the internal mechanical integrity of the well by performing tests in accordance with Section L(2)(a) of this permit. If the well fails the mechanical integrity test or the permittee identifies any problems with the injection system that might impact a USDW, the injection well shall remain shut-in and the permittee shall submit a report in electronic format as soon as possible but no later than five (5) days from the time the permittee becomes aware of the circumstances. The report shall contain a description of the circumstances and if the situation has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the circumstances. Upon completion of the steps to ensure mechanical integrity and the subsequent mechanical integrity demonstration, the permittee shall submit the results and any other required documentation to the Director in an electronic format. If after the testing the well demonstrates mechanical integrity and issues that might impact USDWs are not identified, the permittee shall provide a report of those findings to the Director for review and approval. Injection operations cannot resume until the Director grants approval to recommence injection.
4. **Seismic Events equal to or greater than M 3.5** – For seismic events equal to or greater than 3.5 M, injection operations shall immediately cease. The permittee shall notify the Director of any such event within 24 hours, providing information on the status of the injection well system. If the annulus pressure decreased below the well's set alarm before shutting in the well, then the permittee shall evaluate the internal mechanical integrity of the well by performing tests in accordance with Section L(2)(a) of this permit. The permittee shall also perform an evaluation of the external mechanical integrity of the well in accordance with Section L(2)(b) of this permit. If the well fails either the internal or external mechanical integrity test or the permittee identifies any problems with the system that might impact a USDW, the injection well shall remain shut-in and the permittee shall submit a report in electronic format as soon as

possible but no later than 30 days from the time the permittee becomes aware of the circumstances. The report shall contain a description of the failure and if the failure has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent recurrence of the failure. Upon completion of the steps to ensure mechanical integrity and the subsequent mechanical integrity demonstration, the permittee shall submit the results and any other required documentation to the Director. Injection operations cannot resume until the Director grants approval to recommence injection.

N. TESTING AND MONITORING REQUIREMENTS

The specific measurement and reporting frequencies are listed in Attachment F.

1. Testing and Monitoring Plan –

- (a) The permittee shall maintain and comply with the approved Testing and Monitoring Plan included as Attachment F of this permit and with the requirements at 16 Texas Administrative Code §5.205(o)(2)(l), §5.206(d)(2)(e), and §5.206(e), and any modifications required by the Director after the effective date of this permit. The Testing and Monitoring Plan is an enforceable condition of this permit. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Procedures for all testing and monitoring under this permit shall be submitted to the Director in an electronic format for approval at least 30 days prior to the test if they plan to deviate from the procedures outlined in the Testing and Monitoring Plan in Attachment F of this permit. When the test report is submitted, a full explanation shall be provided as to why any approved procedures were not followed. If the approved procedures were not followed, the Director may take an appropriate action, including but not limited to, requiring the permittee to re-run the test.
- (b) The permittee shall update the Testing and Monitoring Plan as required by 16 TAC §5.207(a)(2)(D) to incorporate monitoring and operational data and in response to AoR reevaluations required under Section G(1) of this permit or demonstrate to the Director that no update is needed. The amended Testing and Monitoring Plan or demonstration shall be submitted to the Director in an electronic format within one year of an AoR reevaluation; following any significant changes to the facility such as addition of monitoring wells or newly permitted injection wells within the AoR; or when required by the Director.
- (c) Following each update of the Testing and Monitoring Plan or a demonstration that no update is needed, the permittee shall submit the resultant information in an electronic format to the Director for review and approval of the results. Once approved by the Director, the revised Testing and Monitoring Plan will become an enforceable condition of this permit.

2. **Carbon Dioxide Stream Analysis** – The permittee shall analyze the carbon dioxide stream with sufficient frequency to yield data representative of its chemical and physical characteristics, as described in the Testing and Monitoring Plan and to meet the requirements of 16 TAC §5.203(j)(2)(A).

3. **Continuous Monitoring** –The permittee shall install and use continuous recording devices to monitor: the injection pressure (at surface and at injection interval), injection flow rate, injection mass, pressure on the annulus between the tubing and the long string of casing, annulus fluid level, and temperature (at surface and at injection interval). This monitoring shall be performed as described in the Testing and Monitoring Plan to meet the requirements of 16 TAC §203(j)(2). The permittee shall maintain for inspection at the facility an appropriately scaled, continuous record of these monitoring results as well as original files of any digitally recorded information pertaining to these operations.
4. **Groundwater Monitoring Above the Confining Zone** – The permittee shall monitor groundwater quality and geochemical changes above the confining zone that may be a result of carbon dioxide movement through the confining zone and additional identified geologic units. All monitoring conducted shall be performed for the parameters identified in the approved Testing and Monitoring Plan at the locations and depths, and at frequencies described in the Testing and Monitoring Plan to meet the requirements of 16 TAC §203(j)(2)(D).
5. **Soil & Soil Gas Sampling** – The permittee shall monitor near-surface soil and soil gas using an array of permanent subsurface soil gas probes which will be installed at 21 representative locations throughout the surface projection of the AoR and adjacent DAC facility, as specified in Attachment F. A soil gas monitoring program shall be conducted during both pre-injection and during injection using permanent soil gas probes as an ongoing, active sample collection method as described in the Testing and Monitoring Plan to meet the requirements of 16 TAC §203(j)(2)(H).
6. **Carbon Dioxide Plume and Pressure Front Tracking** –The permittee shall track the extent of the carbon dioxide plume and pressure front using direct and indirect monitoring methods as described in the approved Testing and Monitoring Plan and in accordance with 16 TAC §203(f)(2)(D) and §203(j)(2)(E). The permittee is required to conduct this monitoring in order to detect and locate the carbon dioxide pressure front and the dissolved carbon dioxide plume and use the data to calibrate the AoR model to determine whether modifications to the AoR is necessary. The data collected will be used to monitor the location of the plume and pressure front, evaluate its movement through time, and compare to the plume and pressure front predictions of the AoR model
 - (a) **Direct Methods** – The permittee shall use direct methods to track the position of the carbon dioxide plume and the pressure front in the injection zone as described in the approved Testing and Monitoring Plan and to meet the requirements of 16 TAC §203(f)(2)(D).
 - (b) **Indirect Methods** – The permittee shall use the indirect monitoring methods to track the position of the carbon dioxide plume and pressure front as described in the Testing and Monitoring Plan and to meet the requirements of 16 TAC §203(j)(2)(E).
7. **Corrosion Monitoring** – The permittee shall perform corrosion monitoring of the well construction materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion on a quarterly basis using the procedures described in the Testing and Monitoring Plan and in accordance with 16 TAC

§5.203(j)(2)(C). This ensures that the well components meet the minimum standards for material strength and performance set forth in 16 TAC §5.203(e)(1)(B).

8. **External Mechanical Integrity Testing** – The permittee shall demonstrate external mechanical integrity annually as described in the approved Testing and Monitoring Plan and shall comply with Section L of this permit in order to meet the requirements of 16 TAC §5.203(h)(1)(D) and §5.206(e)(1).
9. **Pressure Fall-Off Test** – The permittee shall conduct a pressure fall-off test at least once every five (5) years unless more frequent testing is required by the Director based on site-specific information. The test shall be performed as described in the Testing and Monitoring Plan to meet the requirements of 16 TAC §5.203(j)(2)(F).
10. **Additional Monitoring** – If required by the Director as provided in 16 TAC §5.203(j)(2)(G) the permittee shall perform any additional monitoring determined to be necessary to support, upgrade, and improve computational modeling of the AoR evaluation required under 16 TAC §5.203(j)(2)(G) and to determine compliance with standards under 16 TAC §5.203(e)(1) or §5.203(j). An update shall be made to the Testing and Monitoring Plan, and the subsequent monitoring shall be performed as described in the update.

O. REPORTING AND RECORDKEEPING

The permittee shall submit reports at frequencies described in the approved Testing and Monitoring Plan, and as required by this permit. Reports shall contain all the data and information required to be monitored, gathered and reported by this permit and meet the requirements of 16 TAC §5.206(c), §5.206(d), §5.206 (e), and §5.207.

1. **Electronic Reporting** – All reports, submittals, notifications, correspondence to the Director, and records made and maintained by the permittee under this permit shall be in an electronic format. The permittee shall electronically submit all required reports to an address or location as determined by the Director.
2. **Semi-Annual Reports** – The permittee shall submit reports on a semi-annual basis in accordance with 16 TAC §5.207(a)(2)(C). The reporting period for semi-annual reports will be from January 1 through June 30 and from July 1 through December 31. Reports shall be submitted within 30 days of the end of each reporting period. Semi-annual reports shall include all data collected on a continuous, daily, monthly, quarterly and semi-annual basis as described in the approved Testing and Monitoring Plan. The second semi-annual report for each year shall include all data collected on an annual basis as described in the approved Testing and Monitoring Plan. Reports shall contain the following information and data, as well as all other information and data collected not listed below, but as described in the approved Testing and Monitoring Plan:
 - (a) Any changes to the physical, chemical, and other relevant characteristics of the carbon dioxide stream from the proposed operating data;

- (b) Monthly average, maximum, and minimum values for injection pressure, flow rate and daily volume, temperature, and annular pressure;
- (c) A description of any event that exceeds operating parameters for annulus pressure or injection pressure specified in this permit;
- (d) A description of any event which triggers the shut-off systems required in Section(K)(6) of this permit pursuant to 16 TAC §5.206(d)(2)(F) and the response taken;
- (e) The monthly volume and mass of the carbon dioxide stream injected over the reporting period and the volume and mass injected cumulatively as of the end of the reporting period;
- (f) Monthly annulus fluid volume added or removed; and
- (g) Results of the continuous monitoring required in Section N(3) including:
 - (i) A tabulation of: (1) daily maximum injection pressure, (2) daily minimum annulus pressure, (3) daily minimum value of the difference between simultaneous measurements of annulus and injection pressure, (4) daily volume and mass, (5) daily maximum flow rate, and (6) average annulus tank fluid level; and
 - (ii) Graph(s) of the continuous monitoring as required in Section N(3) of this permit, or of daily average values of these parameters. The injection pressure, injection volume and mass and flow rate, annulus fluid level, annulus pressure, and temperature shall be submitted on one or more graphs, using contrasting symbols or colors, or in another manner approved by the Director.
- (h) Results of any additional monitoring identified in the Testing and Monitoring Plan and described in Section N of this permit.

3. 24-Hour Reporting –

- (a) The permittee shall report to the Director any permit noncompliance which may endanger human health or the environment and any events that require implementation of actions in the Emergency and Remedial Response Plan (Attachment H of this permit). Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. Such oral reports shall include, but need not be limited to the following information:
 - (i) Any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW, or any monitoring or other information which indicates that any contaminant may cause endangerment to a USDW;

- (ii) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;
 - (iii) Any triggering of the shut-off system required in Section (K)(7) of this permit (i.e., downhole or at the surface);
 - (iv) Any failure to maintain mechanical integrity;
 - (v) Pursuant to compliance with the requirement at 16 TAC §5.203(j)(2)(G) for surface air/soil gas monitoring or other monitoring technologies, if required by the Director, any release of carbon dioxide to the atmosphere or biosphere; and
 - (vi) Actions taken to implement appropriate protocols outlined in the Emergency and Remedial Response Plan (Attachment H of this permit).
- (b) A written submission shall be provided to the Director in an electronic format within five (5) days of the time the permittee becomes aware of the circumstances described in Section O(3)(a) of this permit. The submission shall contain a description of the noncompliance or emergency, or remedial response and its cause; the period of noncompliance, emergency, or remedial response, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue as well as actions taken to implement appropriate protocols outlined in the Emergency and Remedial Response Plan (Attachment H of this permit); and steps taken or planned to reduce, eliminate and prevent recurrence of the noncompliance or emergency or condition requiring remedial response.

4. **Reports on Well Tests and Workovers** – Report, within 30 days, the results of:

- (a) Periodic tests of mechanical integrity;
- (b) Any well workover, including stimulation;
- (c) Any other test of the injection well conducted by the permittee if required by the Director; and
- (d) Any test of any monitoring well required by this permit.

5. **Advance Notice Reporting** –

- (a) **Well Tests** – The permittee shall give at least 30 days advance written notice to the Director in an electronic format of any planned workover, stimulation, or other well test.
- (b) **Planned Changes** – The permittee shall give written notice to the Director in an electronic format, as soon as possible, of any planned physical alterations or additions to the permitted facility. An analysis of any new injection fluid shall be submitted to the Director for review and

written approval at least 30 days prior to injection; this approval may result in a permit modification.

- (c) **Anticipated Noncompliance** – The permittee shall give at least 14 days advance written notice to the Director in an electronic format of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

6. Additional Reports –

- (a) **Compliance Schedules** – Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted in an electronic format by the permittee no later than 30 days following each schedule date.
- (b) **Transfer of Permits** – This permit is not transferable to any person except after notice is sent to the Director in an electronic format at least 30 days prior to transfer and the requirements of 16 TAC §5.202(c) have been met. Pursuant to requirements at 16 TAC §5.202(c), the Director will require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA. All financial responsibility cost estimates, documentation, and instruments as required by 16 TAC §5.203(n) and by Section H of this permit shall be updated and provided to the Director by any new owner or operator of the well.
- (c) **Other Noncompliance** – The permittee shall report in an electronic format all other instances of noncompliance not otherwise reported with the next monitoring report. The reports shall contain the information listed in Section O(3)(a) of this permit.
- (d) **Other Information** – When the permittee becomes aware of failure to submit any relevant facts in the permit application or that incorrect information was submitted in a permit application or in any report to the Director, the permittee shall submit such facts or corrected information in an electronic format within 10 days of discovery in accordance with 16 TAC §5.203(p).
- (e) **Report on Permit Review** – Within 30 days of receipt of this permit, the permittee shall certify to the Director in an electronic format that the permittee has read and is familiar with all terms and conditions of this permit. This certification shall be signed and made in accordance with requirements of 16 TAC §5.207(c) and (d).

7. Records and Record Retention –

- (a) The permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit (including records from pre-injection, active injection, and post-injection phases) for a period of at least 10 years from collection.

- (b) The permittee shall maintain records of all data required to complete the permit application form for this permit and any supplemental information (e.g., modeling inputs for AoR delineations and reevaluations, plan modifications) submitted under 16 TAC §206(l), §206(m), and §207(e) until at least 10 years after site closure.
- (c) The permittee shall retain records concerning the nature and composition of all injected fluids until at least ten (10) years after site closure.
- (d) The retention periods specified in Section O(7)(a) through (c) of this permit may be extended by the Director at any time. The permittee shall continue to retain records after the retention period specified in Section O(7)(a) through (c) of this permit or any extension thereof expires unless the permittee delivers the records to the Director or obtains written approval from the Director to discard the records.
- (e) Records of monitoring information shall include:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The name(s) of the individual(s) who performed the sampling or measurements;
 - (iii) A precise description of both sampling methodology and the handling of samples;
 - (iv) The date(s) analyses were performed;
 - (v) The name(s) of the individual(s) who performed the analyses;
 - (vi) The analytical techniques or methods used; and
 - (vii) The results of such analyses.

P. WELL PLUGGING, POST-INJECTION SITE CARE, AND SITE CLOSURE

The permittee shall maintain and comply with the approved Well Plugging Plan (Attachment G) and the approved Post Injection Site Care and Site Closure Plan (Attachment I) and shall comply with the requirements of 16 TAC §3.14, §5.203(k), §5.205(b), §5.205(c), §5.205(d), and §5.206(k)(6)(A). The Well Plugging Plan and the Post-Injection Site Care and Site Closure Plan are enforceable conditions of this permit.

1. **Well Plugging Plan Revisions** – If data indicates and the permittee deems it necessary, or if the Director requires the approved plans in Attachments G and I of this permit to be modified, revised plan(s) shall be submitted in an electronic format to the Director for review and written approval. Any amendments to the Well Plugging Plan and/or the Post-Injection Site Care and Site Closure plan shall be approved by the Director and shall be incorporated into the permit and are subject to the permit modification requirements at 16 TAC §5.203(k)(3)(A).

2. **Required Activities Prior to Plugging** – The permittee shall flush the wells with an inert buffer fluid, determine the post-injection bottomhole pressure, and perform final internal and external mechanical integrity tests prior to injection well plugging. The internal and external mechanical integrity tests shall be performed as required by Section L of this permit.
3. **Notice of Plugging and Abandonment** – The permittee shall notify the Director in writing in an electronic format pursuant to 16 TAC §5.206(k)(6)(A) least 60 days before plugging, conversion or abandonment of the well. A shorter notice period may be allowed at the discretion of the Director.
4. **Plugging and Abandonment Approval and Report** –
 - (a) The permittee shall receive written approval from the Director before plugging the well and shall plug and abandon the well as required by 16 TAC §3.14 and §5.203(k), as described in the approved Well Plugging Plan (Attachment G of this permit).
 - (b) Within 60 days after plugging, the permittee shall submit in an electronic format a plugging report to the Director. The report shall be signed and certified by the permittee per 16 TAC §5.203(k)(4), and by the person who performed the plugging operation (if other than the permittee.) The permittee shall retain the well plugging report in an electronic format for ten (10) years following site closure. The report shall include:
 - (i) A statement that the well was plugged in accordance with the approved Well Plugging Plan (Attachment G of this permit); or
 - (ii) If the actual plugging differed from the approved plan, a statement describing the actual plugging and an updated plan specifying the differences from the plan previously submitted and explaining why the Director should approve such deviation. If the Director determines that a deviation from the plan incorporated in this permit may endanger USDWs, the permittee shall replug the well as required by the Director.
5. **Temporary Abandonment** – If the permittee ceases injection for more than 24 consecutive months, the well is considered to be in a temporarily abandoned status, and the permittee shall plug and abandon the well in accordance with the approved Well Plugging Plan, 16 TAC §5.203(k), or make a demonstration of non-endangerment of this well that is satisfactory to the Director while it is in temporary abandonment status. During any periods of temporary abandonment or disuse, the well shall be tested to ensure that it maintains mechanical integrity, in compliance with the requirements and frequency specified in Section L(2) of this permit. The permittee shall continue to comply with the conditions of this permit, including all monitoring and reporting requirements in compliance with all requirements of this permit and all applicable regulations.
6. **Post-Injection Site Care and Site Closure Plan** – The permittee shall maintain and comply with the Post-Injection Site Care and Site Closure Plan in Attachment I of this permit and comply with the requirements of

16 TAC §5.203(m), and §5.206(k). The Post-Injection Site Care period is the length of time anticipated to demonstrate that the carbon dioxide injection poses no threat to USDWs and is an enforceable condition of this permit.

- (a) Upon cessation of injection, the permittee shall either submit in electronic format for the Director's approval an amended Post-Injection Site Care and Site Closure Plan or demonstrate through monitoring data and modeling results that no amendment to the plan is needed.
- (b) At any time during the life of the project, the permittee may modify and resubmit in an electronic format the Post-Injection Site Care and Site Closure Plan for the Director's approval per 16 TAC §5.206(k)(B). The permittee may, as part of such modifications to the Plan, request a modification to the post-injection site care timeframe that includes documentation of the information at 16 TAC §5.203(m)(7)(ii).
- (c) The monitoring as outlined in the approved Post-Injection Site Care and Site Closure Plan shall define the position of the carbon dioxide plume and pressure front, provide a comparison of data collected to the predictions made by the AoR model, and demonstrate that USDWs are not being endangered per 16 TAC 40 CFR §5.206(e)(3) and §5.206(k).
- (d) Prior to authorization for site closure, the permittee shall submit to the Director for review and approval, in an electronic format, a demonstration, based on information collected pursuant to Section P(6)(b) of this permit, that the carbon dioxide plume and the associated pressure front do not pose an endangerment to USDWs and that no additional monitoring is needed to ensure that the project does not pose an endangerment to USDWs, as required under 16 TAC §5.206(k)(3). The Director reserves the right to amend the post-injection site monitoring requirements (including an extension of the monitoring period) if there is a concern that USDWs are at risk of endangerment.
- (e) The permittee shall notify the Director in an electronic format at least 120 days before site closure. At this time, if any changes to the approved Post-Injection Site Care and Site Closure Plan in Attachment I of this permit are proposed, the permittee shall submit a revised plan.
- (f) After the Director has authorized site closure, the permittee shall plug all monitoring wells as specified in Attachments G and I of this permit in a manner which will not allow movement of injection or formation fluids that endangers a USDW. The permittee shall also restore the surface site to its pre-injection condition.
- (g) The permittee shall submit a site closure report in an electronic format to the Director within 90 days of site closure. The report shall include the information specified at 16 TAC §5.203(k).

- (h) The permittee shall record a notation on the deed to the facility property or any other document that is normally examined during a title search that will in perpetuity provide any potential purchaser of the property the information listed at 16 TAC §5.206(l).
- (i) The permittee shall retain for 10 years following site closure an electronic copy of the site closure report, records collected during the post-injection site care period, and any other records required under 16 TAC §5.203(k), §5.206(j) and §5.206(k)(6). The permittee shall deliver the records in an electronic format to the Director at the conclusion of the retention period.

Q. EMERGENCY AND REMEDIAL RESPONSE

The Emergency and Remedial Response Plan describes actions the permittee shall take to address movement of the injection or formation fluids that may cause an endangerment to a USDW during construction, operation, and post-injection site care periods. The permittee shall maintain and comply with the approved Emergency and Remedial Response Plan (Attachment H of this permit), which is an enforceable condition of this permit, and with 16 TAC §5.203(n).

1. If the data collected indicates evidence that the carbon dioxide plume and or pressure front may cause endangerment to a USDW, the permittee shall:
 - (a) Cease injection in accordance with Sections K(9) and Attachments E or H of this permit;
 - (b) Take all reasonable steps necessary to identify and characterize any release from the underground injection system;
 - (c) Notify the Director within 24 hours; and
 - (d) Implement the approved Emergency and Remedial Response Plan in (F of this permit) approved by the Director.
2. At least every five years, or more frequently if the monitoring and operational data warrant, the permittee shall review and update the Emergency and Remedial Response Plan as required at 16 TAC §5.207(a)(2)(D)(iv), or demonstrate to the Director that no update is needed. The permittee shall also incorporate monitoring and operational data and in response to AoR reevaluations required under Section G.4 of this permit or demonstrate to the Director that no update is needed. The amended Emergency and Remedial Response Plan or demonstration shall be submitted to the Director in an electronic format within thirty (30) days of an AoR reevaluation in accordance with TAC16 §5.207 (a)(3), following any significant changes to the facility such as the addition of injection wells, or when required by the Director. If the amendments to the Emergency and Remedial Response Plan cause the cost estimates to change, then a new Financial Responsibility Demonstration shall be submitted for review and approval by the Director in accordance with Section H of this permit.

3. Following each update of the Emergency and Remedial Response Plan or a demonstration that no update is needed, the permittee shall submit the resultant information in an electronic format to the Director for review and confirmation of the results. Once approved by the Director, the revised Emergency and Remedial Response Plan will become an enforceable condition of this permit.

R. COMMENCING INJECTION

The permittee may not commence injection until:

1. Results of the formation testing and logging program as specified in Section J of this permit and in 16 TAC §5.203(f), are submitted to the Director in an electronic format and subsequently reviewed and approved by the Director;
2. Mechanical integrity of the wells has been demonstrated in accordance with 16 TAC §5.102(31), and §5.203(h)(1)(D), and in accordance with Section L(1) through (3) of this permit;
3. The completion of corrective action required by the Area of Review and Corrective Action Plan found in Attachment A of this permit in accordance with 16 TAC §5.203(d)(1)(A) - (C);
4. All requirements at 16 TAC §5.203 have been met, including but not limited to reviewing and updating of the Area of Review and Corrective Action, Testing and Monitoring, Well Plugging, Post-Injection Site Care and Site Closure, and Emergency and Remedial Response plans to incorporate final site characterization information, final delineation of the AoR, and the results of pre-injection testing, and information has been submitted in an electronic format, reviewed and approved by the Director;
5. Construction is complete and the permittee has submitted to the Director in an electronic format a notice that completed construction is in compliance with 16 TAC §5.203(e) (1) and Section I of this permit;
6. The Director has inspected or otherwise reviewed the injection well and all submitted information and finds it is in compliance with the conditions of the permit;
7. The Director has approved demonstration of the alarm system and shut-off system under Section K.7 of this permit; and.
8. The Director has given written authorization to commence injection.

S. PAYMENT OF FEES TO THE STATE OF TEXAS

In accordance with 16 TAC §5.205, the permittee shall pay the following fees:

1. Injection fee. The operator must pay to the Commission an annual fee of \$0.025 per metric ton of CO₂ injected into the geologic storage facility in accordance with 16 TAC §5.205 (a)(2).

2. 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 in accordance with 16 TAC §5.205 (a)(3).
3. 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 in accordance with 16 TAC §5.205 (a)(1)(B).

T. ANNUAL REPORTING OF COMMUNITY ENGAGEMENT ACTIVITIES ASSOCIATED WITH THIS PERMITTED CARBON SEQUESTRATION FACILITY

The permittee shall conduct outreach to communities and residents in the AoR. Such outreach shall include coordination with emergency responders and residents as necessary to update the Emergency and Remedial Response Plan. The permittee shall provide with its annual report to the Commission, a description of the outreach activities over the period of time covered by the annual report, in accordance with 16 TAC §5.207 (a)(2)(D)(vi).

ATTACHMENTS

These attachments include, but are not limited to, permit conditions and plans concerning operating procedures, monitoring and reporting, as required by 16 Texas Administrative Code §5.203, §5.205, §5.206, and §5.207. The permittee shall comply with these conditions and adhere to these plans as they are approved by the Director by their incorporation into this permit.

A. AREA OF REVIEW AND CORRECTIVE ACTION PLAN

B. WELL CONSTRUCTION DETAILS

C. STIMULATION PROGRAM

D. PRE-INJECTION / PRE-OPERATIONAL TESTING PLAN

E. INJECTION WELL OPERATING CONDITIONS

F. TESTING AND MONITORING PLAN

G. WELL PLUGGING PLANS

H. EMERGENCY AND REMEDIAL RESPONSE PLAN

I. POST-INJECTION SITE CARE AND SITE CLOSURE PLAN

J. FINANCIAL ASSURANCE DEMONSTRATION