

FACT SHEET

Intent to Issue Class VI Underground Injection Control Permit Bluebonnet Sequestration Hub, LLC Bluebonnet Sequestration Hub Facility Chambers and Liberty Counties, Texas

CO2 Storage Project

Bluebonnet Sequestration Hub, LLC (Bluebonnet) has applied to the Railroad Commission of Texas (RRC) for a Class VI Underground Injection Control (UIC) permit to construct and operate six (6) carbon dioxide (CO2) injection wells for their Bluebonnet Sequestration Hub Facility. The proposed injection wells will be located in northeast Chambers County approximately 4 miles west of Winnie, Texas. The locations of the injection wells are shown in Table 1 below.

Table 1: Well Identification

Well Name & No.	Latitude (NAD83)	Longitude (NAD83)
Bluebonnet CCS 1	29.812013	-94.436632
Bluebonnet CCS 2	29.804773	-94.464128
Bluebonnet CCS 3	29.853032	-94.49827
Bluebonnet CCS 5	29.812354	-94.436646
Bluebonnet CCS 6	29.817638	-94.464295
Bluebonnet CCS 7	29.853442	-94.49827

Bluebonnet plans to inject approximately 1.31 million metric tons (1.31 MMT) of carbon dioxide into the six (6) Bluebonnet Sequestration injector wells per year (MMTPA) for 20 years.

Bluebonnet plans to inject a cumulative total of 157.2 million metric tons (MMT) into the proposed well over the 20-year injection period of the Bluebonnet CCS Project.

Carbon dioxide will come from nearby industrial power-generating plants, refineries, and chemical production, natural-gas processing, and natural-gas liquefaction facilities along the Gulf Coast, from the Beaumont/Port Arthur area to the east and to the Houston area in the west.

Bluebonnet selected the locations of the six proposed injection wells based on its own geological research and used site-specific data to ensure that the carbon dioxide would be safely stored in the proposed injection formations. The three proposed injection zones from top to bottom are the Lower Miocene, Frio, and Hackberry Formations, perforated across multiple injection intervals ranging in depth between approximately 5,200 – 8,800 feet below ground surface. The Lower Miocene injection reservoir is top-sealed and geologically isolated by approximately 800 feet of very low permeability Miocene Composite Confining Zone and Lower Miocene Shale. The Frio (Oligocene) injection reservoir is top-sealed and geologically isolated by approximately 1000 feet of overlying Anahuac Shale. The Hackberry (Oligocene) injection reservoir is top-sealed and geologically isolated by approximately 200 feet of overlying Frio shale. The shallowest Lower Miocene injection reservoir at the Bluebonnet Sequestration site lies approximately 3,500 feet below (deeper than) the deepest underground source of drinking water (USDW) at that site.

Technical background and details of the Bluebonnet Sequestration carbon storage project:

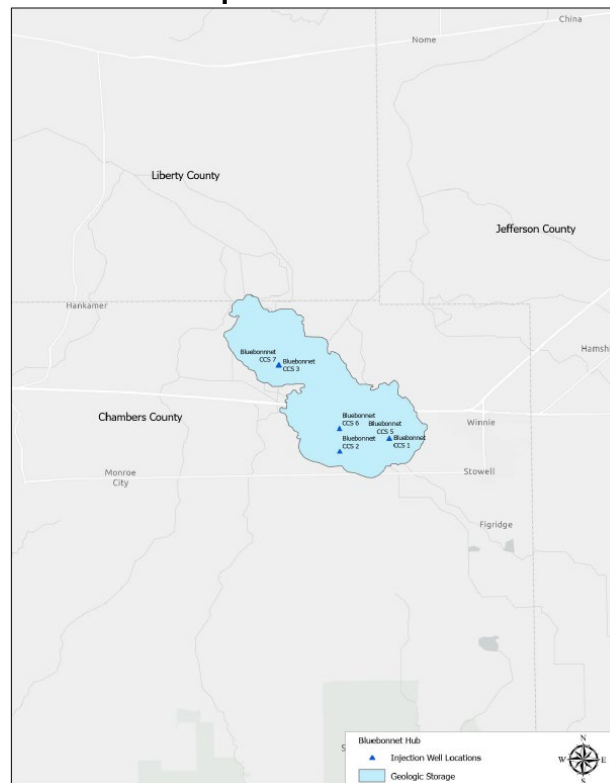
The RRC's review of the permit application determined that the proposed injection would comply with the Class VI UIC regulations. Therefore, the RRC proposes to issue permits for the proposed injection well. RRC regulations require that the RRC Class VI UIC permits for carbon dioxide storage specify conditions for the construction, operation, monitoring, reporting, plugging, post-

injection site care, and site closure of Class VI injection well. These conditions are designed to prevent the movement of fluids into any underground source of drinking water. Refer to Chapter 5, Subchapters A and B for the general provisions of Class VI UIC permits. Information on the proposed activity and proposed permit conditions is provided below.

Area of Review and Corrective Action:

The Area of Review, or AoR, is the region surrounding the geologic storage project where underground sources of drinking water may be endangered by the injection activity (e.g., if there are any improperly sealed, completed, or abandoned wells that penetrate the confining zone that could provide a conduit for fluid migration). The Area of Review for the proposed well is approximately 22 square miles and was delineated using a model that predicts the movement of the carbon dioxide plume and pressure front based on available information about planned injection operations and the subsurface rock formations. The AoR is shown in Figure 1 below.

Figure 1. Bluebonnet Sequestration Hub - Area of Review (AoR)



Based on a Bluebonnet search of well records and aeromagnetic (well locator) survey, there are twenty-six (26) pre-existing legacy wellbores penetrating the top seal or injection interval within the Area of Review that require corrective action by Bluebonnet Sequestration. Twenty-five (25) of these wells were identified as requiring remedial actions to isolate the injection zone properly from the confining zone and USDW zones. Bluebonnet has set aside funds and developed a plan and phased schedule of work to re-enter, and permanently plug, and abandon each of these pre-existing legacy wells with modern CO₂ non-reactive cement and corrosion-resistant alloy down-hole well-plugging components.

Bluebonnet will re-evaluate the Area of Review by assessing monitoring and operational data every five (5) years over the duration of the project to verify that the carbon dioxide plume and pressure front are moving as predicted. If any significant changes from the modeled predictions are detected, Bluebonnet will revise the project-specific plans described here, and RRC will modify the permit per 16 TAC §5.202(d)(2).

Underground Sources of Drinking Water:

The lowest geologic unit in the Area of Review that has the potential to be an underground source of drinking water is the Chicot Aquifer. The base of the Chicot Aquifer USDW (underground source of drinking water, defined as having 10,000 mg/liter or less of total dissolved solids) within the Bluebonnet Sequestration Hub site ranges in depth between approximately 1,100 and 1,700 feet below the ground surface. The Groundwater Advisory Unit has determined that the deepest (base of) USDW occurs at a depth 1,550 feet below the ground surface in the Bluebonnet Sequestration Hub Area of Review.

Well Construction Requirements:

Bluebonnet proposes to drill six (6) Class VI injection wells for the Bluebonnet Sequestration Hub Facility. All aspects of the proposed design of the Bluebonnet injection wells meet the regulatory criteria stipulated by 16 TAC §5.203(e). All Class VI wells must be constructed with materials and cements that can withstand exposure to carbon dioxide and carbon dioxide/water mixtures over the life of the project. Class VI wells also must be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water.

The Bluebonnet injection wells will be equipped with an automatic surface shut-off system that will shut off the well if any permitted operating parameters—such as injection pressure—diverge from permit limitations. Bluebonnet may not commence construction, including drilling, of any new well until a final W-1 permit has been issued and is effective.

Injection Fluid:

The RRC will review whether the chemical and physical characteristics of the carbon dioxide stream from any additional proposed source meet the permit requirements. The RRC will also review whether injecting carbon dioxide from any additional source(s) in the future would alter the project or permit requirements and result in the need for a major permit modification, including public notice.

Maximum Injection Pressure:

The Bluebonnet injector wells have maximum allowable bottomhole and surface injection pressures as shown in Table 2 (below). These maximum allowable (not-to-exceed) bottomhole injection pressures ensure that the pressure during injection does not initiate fractures in the injection or confining zones and ensures that the injection pressure will not cause movement of injected fluids or formation fluids vertically upward into an underground source of drinking water (USDW).

Table 2: Maximum Permitted Injection Pressures

Well Name & No.	Maximum. Surface Injection Pressure (psig)	Maximum Bottomhole Injection Pressure (psig)
Bluebonnet CCS 1	2,500	5,876
Bluebonnet CCS 2		5,455
Bluebonnet CCS 3		5,570
Bluebonnet CCS 5	2,300	4,330
Bluebonnet CCS 6		4,250
Bluebonnet CCS 7		4,125

Monitoring and Reporting Requirements:

The draft permit will implement an RRC-approved Testing and Monitoring Plan. The permittee is required to analyze the carbon dioxide stream quarterly to provide information about its chemical and physical characteristics. Bluebonnet is also required to demonstrate well integrity before injection begins and periodically throughout the duration of injection operations. Bluebonnet is required to conduct and pass a two-part mechanical integrity test, in accordance with 16 TAC §5.203(h) and §5.206(f), before the RRC will authorize the start of injection.

After injection begins, Bluebonnet is required to:

- Continuously observe and record injection pressure, flow rate and volume, and the pressure on the annulus (the space between casing and tubing) to detect leaks in the casing, tubing, or packer.
- Annually demonstrate external mechanical integrity using a temperature or noise log or another approved method to detect any fluid movement behind the casing.
- Test the injection wells for signs of corrosion every quarter to provide early indication of any well material corrosion due to contact with carbon dioxide in the presence of water that could compromise the well.
- Monitor the environment near the wells to verify that the project and the injected carbon dioxide plume are behaving as predicted and that carbon dioxide is not migrating outside the injection formation. Bluebonnet will perform groundwater quality monitoring in shallow and deep wells quarterly to detect geochemical changes that may be a result of injection - such as leaching or mobilization of heavy metals and organic compounds or fluid displacement that could impact Underground sources of drinking water.
- Perform pressure fall-off testing at least every five years to verify that the injection zone is responding to injection as predicted.
- Track the movement of the carbon dioxide plume and pressure front using direct methods such as fluid monitoring of the injection zone and underground sources of drinking water and pressure monitoring of the injection zone, and indirect methods such as seismicity monitoring and pulse neutron logging of well bores to verify that the carbon dioxide plume and pressure front are moving as predicted or to provide early indication if they are not.

Bluebonnet will be required to submit results of this monitoring to the RRC semiannually or within 30 days of the completion of a mechanical integrity test or other required testing.

Emergency and Remedial Response:

As required by 16 TAC §5.203(n), Bluebonnet has prepared and submitted to the RRC for approval, a site-specific Emergency and Remedial Response Plan (ERRP) that identifies key resources / infrastructure in the Area of Review that must be protected.

The Emergency and Remedial Response Plan describes the responses that would be taken to address adverse events, and identifies the staff, equipment, and other resources available to support emergency and remedial response events. The emergency and remedial response provisions of the permit would facilitate expeditious responses and prevent or mitigate harm to public health and the environment, including underground sources of drinking water. The Emergency and Remedial Response Plan will be an enforceable part of the permit.

Financial Responsibility:

Bluebonnet has demonstrated, and will maintain, adequate financial responsibility to perform all needed corrective action on wells in the Area of Review, to plug the injection wells, to perform all required post-injection site care, to close the site, and to conduct any needed emergency and remedial response measures. The total cost estimates for these activities to be covered by the

approved financial assurance mechanisms is \$35,925,514 in 2025 dollars. Bluebonnet will use a Letter of Credit to cover costs and demonstrate financial responsibility.

The draft permits require the permittee to annually update cost estimates for the covered activities. These provisions ensure that resources are available to perform the required activities without using public funds.

Plugging and Abandonment:

The draft permits include an Injection Well Plugging Plan for environmentally protective well plugging at the cessation of injection operations. The wells (injector well and surrounding monitoring wells) will be plugged using approved materials that are compatible with carbon dioxide/water mixtures to ensure that the wells will not serve as conduits for fluid movement into underground sources of drinking water.

Post-Injection Site Care and Site Closure:

Bluebonnet will be required to implement an RRC-approved Post-Injection Site Care and Site Closure Plan. Following the cessation of injection, the permittee will be required to continue to monitor groundwater quality and track the position of the carbon dioxide plume and pressure front in a similar manner to what is described under “Monitoring and Reporting Requirements” above. This monitoring will help confirm predictions about the behavior of the carbon dioxide plume and pressure front (e.g., that pressures are subsiding after injection ceases) and provide early indication of any potential endangerment of underground sources of drinking water. The permittee will continue this post-injection site monitoring for a period of 50 years following the cessation of injection. At the end of the Post-Injection Site Care period, if site data support it, the RRC may authorize the permittee to close the site.

Following authorization to proceed with site-closure activities, the permittee will plug all monitoring wells with carbon dioxide-compatible materials to ensure they cannot serve as conduits for fluid movement and will restore the site to its original condition.

Administrative Record

The full administrative record, including all data submitted by Bluebonnet in support of its permit application, is available for public review at the RRC’s District 03 Office at the following address:

Railroad Commission of Texas
District 03 Office
1919 N Loop West, Suite 620
Houston, TX 77008
Houston@rrc.texas.gov

The office is open 8:00 a.m. – 5:00 p.m., weekdays. To review the administrative record or for additional information please contact Peter Fisher (Director of RRC Oil and Gas Division – District 03 at phone: 713-869-5001 and fax: 713-869-9621.

On the Web

For more information about the project and draft Class VI UIC Permits:

<https://www.rrc.texas.gov/oil-and-gas/applications-and-permits/injection-storage-permits/co2-storage/co2-notices>