United States Environmental Protection Agency

Public Comments Sought on Class VI UIC Injection Well Carbon Storage Draft Permits; Fact Sheet

ExxonMobil Low Carbon Solutions Onshore LLC, Rose Carbon Capture Project Class VI UIC Injection Wells

Jefferson County, Texas (Permit Nos. R6-TX-245-C6-0001, R6-TX-245-C6-0002, and R6-TX-245-C6-0003) July 2025

Options for Participating in the Permitting Process

EPA is providing the public 34 days to submit comments on its proposed action. This 34-day comment period runs from July 1st, 2025, to August 4th, 2025. Please visit https://www.epa.gov/tx/public-notice-uic-class-vi-permit-intent-issue-exxonmobil-low-carbon-solutions-onshore-storage for more information.

Submit written comments at https://www.regulations.gov/docket/EPA-R06-OW-2025-0421 under Docket #EPA-R06-OW-2025-0421.

EPA will hold a virtual public hearing for oral comments on the draft permits on:

Friday, July 31st, 2025
The virtual Public Hearing will start at 6:00 p.m. (CST) and will last until no later than 9:00 p.m. (CST).
The Public Hearing may close before 9:00 p.m. (CST) if there are no further interested parties wishing to provide comments.
Pre-registration for the virtual hearing can be found at: https://www.zoomgov.com/j/1612915111 or by visiting our public notice website at: https://www.epa.gov/tx/public-notice-uic-class-vi-permit-intent-issue-exxonmobil-low-carbon-solutions-onshore-storage

You must provide oral comments at the hearing or submit written comments on the draft permit decision by the end of the comment period to preserve your

The U.S. Environmental Protection Agency, Region 6 (EPA), is accepting comments from the public on its intent to issue three Underground Injection Control (UIC) Class VI permits to ExxonMobil Low Carbon Solutions Onshore LLC (ExxonMobil) under Part C of the Safe Drinking Water Act (SDWA). These UIC Class VI permits, if issued, will allow ExxonMobil to convert three existing Class V injection wells permitted by the state in Jefferson County, Texas, to carbon dioxide storage injection wells for the long-term storage of carbon dioxide. The process of injecting carbon dioxide for storage in geologic formations deep underground is known as "geologic sequestration," a form of "carbon sequestration." Carbon sequestration is the process of reducing carbon dioxide emissions by capturing them at their source or from the atmosphere and storing them long-term, either geologically or biologically.

ExxonMobil proposes to capture carbon dioxide from high-concentration industrial sources, including clean hydrogen, ammonia, direct-reduced iron plants, and natural gas treatment facilities. The composition of the captured carbon dioxide stream will primarily consist of carbon dioxide, with less than 1% hydrogen, and less than 3% methane. A pipeline will be used to transport the carbon dioxide stream from the sources to the proposed carbon sequestration site, where it will be injected into the subsurface via the three injection wells currently authorized under state permits.

ExxonMobil selected the locations of the wells, already constructed under authorizations provided by state permits, following an extensive process to gather and evaluate available information about the project site. This ensured that the wells are in a suitable geologic location, allowing carbon dioxide to be securely stored underground rather than being released into the atmosphere. ExxonMobil used the gathered information to construct the wells under state permits, convert and develop operating procedures, ensuring that the wells operate safely and do not endanger underground sources of drinking water (USDW) as Class VI wells. The rock formations where the carbon dioxide will be stored are located at depths ranging

right to appeal a final permitting decision.

Please contact Ian Ussery at Ussery.Ian@epa.gov or by phone at (214) 665-6639 for additional assistance.

from approximately 3,410 to 7,806 feet below mean sea level (BMSL), and studies of the site show that there are about 2,000 feet of low permeability shales between the lowermost USDW in the area and the proposed carbon dioxide reservoir below.

The draft permits require ExxonMobil to test and monitor the condition of the wells, the injection pressure, and the location and size of the plume of injected carbon dioxide during the 13-year timeframe of proposed carbon dioxide injection and for a 50-year post-injection site care (PISC) timeframe after injection is finished. These requirements are to make sure that the injection wells work properly during injection, to determine if any changes in operation are needed to protect USDWs, to observe how the movement of the carbon dioxide plume compares to modeled predictions during and after injection, and to confirm that it is safe to close the project site at the end of the post-injection site care period.

The draft permits allow ExxonMobil to inject an average of 1.1 to 1.67 million metric tons of carbon dioxide per year into each well, with a maximum total of 5 million metric tons per year across all three injection wells. Over the 13-year injection period, ExxonMobil would thus be allowed to inject a maximum total of 53 million metric tons of carbon dioxide. However, under the draft permits, ExxonMobil must obtain a separate "authorization to inject" letter from the EPA before commencing injection.

How did the EPA make its tentative decision?

In reviewing ExxonMobil's permit applications, the EPA evaluated technical information and project-specific data with support from the Department of Energy and agency contractors. A list of the project-specific data that EPA reviewed to make a tentative permitting decision is presented below. The description of the data also includes a reference to where interested members of the public can find this information in the permit administrative record. The administrative record includes other documents that are part of the supporting file for the draft permit.

- Advanced computational modeling to predict the maximum extent of the carbon dioxide plume and pressure front defining the proposed project area, and corrective action procedures for all existing non-project wellbores near the project site found to be insufficiently plugged and abandoned. The computational modeling is based on thorough site characterization, monitoring, and operational data. See the "Class VI Permit Application for Rose Carbon Capture and Sequestration Project Injection Wells No. 01, No. 02, and No. 03" (dated May 2025), Site Characterization document (Section 2 of the permit application, dated May 2025), and Area of Review (AoR) and Corrective Action Plan document (Section 3 of the permit application, dated May 2025); EPA's requests for additional information (RAIs), including RAI #1 (dated March 4, 2025) and RAI #2 (dated May 5, 2025); ExxonMobil's responses to each RAI and updated application submittals in response documents dated March 21, 2025 (RAI #1) and May 14, 2025 (RAI #2); and Federal Technical Assistance Program documents, DOE_Rose_Corrective_Action_Review (dated February 2024), DOE_ExxonMobil_Rose_R06-TX-0024_Consensus_Report_to_EPA (dated December 2024), DOE_RX06-exxon well construction checklist (dated January 2025).

- A detailed study of the regional and site geology (rock layers and structures) to confirm that the carbon dioxide will remain in the formation into which it is injected. This includes the presence of a thick, dense, impermeable formation above the injection formation that will serve as a "confining zone" to prevent upward movement of the carbon dioxide out of the injection formation. The

applicant submitted information about the geologic structure at the project site; the integrity of the confining zone; the geomechanical properties of the site; faults and fractures in the area; the storage capacity of the injection formation; the seismic history of the area; and site hydrogeology and water resources (e.g., springs, mines, water wells). See the Site Characterization document (Section 2 of the permit application, dated May 2025) and AoR and Corrective Action Plan document (Section 3 of the permit application, dated May 2025); RAI #1 and RAI #2; and ExxonMobil's responses to each RAI.

- The submitted well construction design. This includes construction materials, testing and monitoring procedures, and emergency shut-off procedures. See the Well Construction Plan and Operating Conditions (Section 4 of the permit application, dated May 2025); the Testing and Monitoring Plan (Section 5 of the permit application, dated May 2025); the Emergency and Remedial Response Plan (Section 8 of the permit application, dated May 2025); RAI #1 and RAI #2; and ExxonMobil's responses to each RAI.

- The characteristics of the carbon dioxide to be injected. This includes the chemical composition of the carbon dioxide stream and potential geochemical reactions between the stream and the injection reservoir brines and mineralogy. See the Site Characterization document (Section 2 of the permit application, dated May 2025) and the AoR and Corrective Action Plan document (Section 3 of the permit application, dated May 2025); RAI #1; and ExxonMobil's responses to the RAI.

- The proposed approach and technologies ExxonMobil would use to monitor the project during and after injection. This includes monitoring the composition of the carbon dioxide, the physical condition of the well, the location and size of the carbon dioxide plume, pressure changes in the subsurface, water quality in formations above the injection formation, and seismicity (including events too small to be felt at the surface). See the Testing and Monitoring Plan (Section 5 of the permit application, dated May 2025); ExxonMobil's Quality Assurance Surveillance Plan for testing and monitoring activities (Attachment E to the permit application, dated May 2025); RAI #1 and RAI #2; and ExxonMobil's responses to each RAI.

- The financial resources ExxonMobil will have available to perform corrective action, plug the injection wells, responsibly operate, monitor, close the project, and respond to emergency events. This includes a cost estimation for project activities and financial instruments sufficient to meet the financial responsibility requirements. See the Financial Assurance Demonstration Plan document (Section 9 of the permit application, dated May 2025); RAI #1 and RAI #2; and ExxonMobil's responses to the RAIs.

- ExxonMobil's approach to plug the injection wells to prevent endangerment of USDWs, perform monitoring following cessation of injection to track the carbon dioxide plume and pressure front, and close the site. See the Injection Well Plugging Plan document (Section 6 of the permit application, dated May 2025), the Post-Injection Site Care (PISC) and Site Closure Plan (Section 7 of the permit application, dated May 2025), and ExxonMobil's Quality Assurance Surveillance Plan (Attachment E to the permit application, dated May 2025); RAI #1 and RAI #2; and ExxonMobil's responses to each RAI.

The more technical portion of this fact sheet below provides additional discussion about these data and EPA's review and analysis of this information that led to this tentative permitting decision. References to the

administrative record are also included to allow the public to review the data and EPA's comprehensive analysis.

What happens next in the permit process?

After the close of the public comment period, including the public hearing referenced on page one of this document, EPA will review all public comments and respond in writing to all significant comments on the draft permits before making a final decision on whether to issue the permits. The EPA will respond to all significant comments on the draft permits. The public comment period is the only opportunity for the public to provide comments on the draft permits. If the EPA decides to issue final permits, there will be no additional opportunity to comment on the final permit. However, the final permits may be appealed by any person who commented on the draft permits or participated in the public hearing.

If final permits are issued, ExxonMobil will be authorized to convert the three existing Class V injection wells permitted by the state to Class VI GS wells for the long-term storage of carbon dioxide. However, ExxonMobil would not be authorized to inject until it has complied with specified permit requirements, including the requirements for pre-operational testing under Section J of the permits and the requirements for testing described in Attachment 4 (Testing and Monitoring Plan), which may include but are not limited to, pre-injection logging, sampling, testing, and coring to verify injection and confining zone characteristics and confirm well integrity. The EPA reviews the data related to ExxonMobil's compliance with these requirements before issuing authorization to inject. However, there will be no additional opportunity for public comment prior to the EPA issuing an official "authorization to inject" letter.

Additional Information and How to Appeal

The full administrative record, including all data submitted by ExxonMobil in support of its permit applications, is available for public review at regulations.gov under Docket #EPA-R06-OW-2025-0421 (https://www.regulations.gov/docket/EPA-R06-OW-2025-0421). To review the administrative record in person or for additional information, please contact Ian Ussery at 214-665-6639 or Ussery.Ian@epa.gov.

Additional Project Details

For more information about the ExxonMobil Rose Carbon Capture project: https://www.epa.gov/tx/public-notice-uic-class-vi-permit-intent-issue-exxonmobil-low-carbon-solutions-onshore-storage

Legal Notice for Final Permit Decision Appeal

To preserve your right to appeal any final permit decision, you must either participate in the public hearing or send in written comments on the draft permit decision by the end of the comment period.

The first appeal must be made to the Environmental Appeals Board; only after all agency review procedures have been exhausted may you file an action in the appropriate Circuit Court of Appeals.

Technical Background and Details of the ExxonMobil Rose Project

EPA conducted a thorough review of ExxonMobil's permit application. The data and information ExxonMobil provided as part of the permit application (and in subsequent responses for additional or clarifying information) are publicly available as part of the permit administrative record, along with other information EPA considered in its decision-making. This section of the draft permit fact sheet provides additional technical background and details on the Rose CCS

project to help the public better understand how the EPA reached its tentative decision to permit.

Additionally, this section of the draft permit fact sheet provides details about the draft permit requirements. Title 40 of the Code of Federal Regulations (CFR) Parts 144 and 146 require EPA's permits for carbon dioxide storage, known as Class VI Underground Injection Control (UIC) permits, to specify conditions for the construction, operation, monitoring, reporting, plugging, and post-injection site care and site closure of Class VI injection wells to prevent the movement of fluids into any underground sources of drinking water (USDW). See 40 CFR Parts 144 and 146 for the general provisions of underground injection permits.

EPA's review of ExxonMobil's permit applications indicates that no endangerment to USDWs will result from the proposed injection, so EPA proposes to issue permits for these wells. Per 40 CFR 124.8, information and highlighted permit conditions for the proposed well(s) are presented below.

Area of Review and Corrective Action: Under 40 CFR 146.84, the Area of Review (AoR) refers to the region surrounding the geologic sequestration project where injection activity may endanger Underground Sources of Drinking Water (USDWs). The combined AoR for these wells is an area of approximately 10 square miles. It was delineated in accordance with 40 CFR 146.84(c)(1) using a computational model that predicts the movement of the carbon dioxide plume and the critical pressure front based on available information about planned injection operations and the characteristics of the subsurface rock formations. See Figure 1.

EPA reviewed ExxonMobil's analysis of well records, which determined that two wells within the AoR require plugging because the wellbores penetrate the injection and confining zones and will not be used for injection or monitoring purposes in the proposed injection project. The draft permits require ExxonMobil to properly plug and abandon the wells before the EPA will authorize injection.

As described in the "Monitoring and Reporting Requirements" section below, the draft permits require ExxonMobil to track the extent of the carbon dioxide plume and the associated pressure front to verify that the project is behaving as predicted by the modeling. Additionally, as required at 40 CFR 146.84(e), ExxonMobil must re-evaluate the AoR at a minimum of every five years (at a higher frequency if warranted by monitoring and operational conditions) by evaluating monitoring and operational data, then update the initial computational modeling to re-define the AoR for the permit application, if needed. The re-evaluation will verify that the carbon dioxide plume and pressure front are moving as predicted. The specific procedures and considerations for the reevaluations are contained in Section G and Attachment 2 (AoR and Corrective Action Plan) to the permits. If there are any significant changes from the modeled predictions, ExxonMobil must revise the project-specific plans described below, and the EPA will modify the permits in accordance with 40 CFR 144.39.

EPA reviewed ExxonMobil's AoR and Corrective Action Plan (Section 3 of the permit application) to ensure that it complies with all requirements. Specifically, the EPA examined ExxonMobil's computational modeling approach to verify that it meets the needs for complex AoR delineations and that the model assumptions and inputs accurately reflect the site-specific geologic conditions as described in the permit application. The EPA asked ExxonMobil questions about its modeling approach, which included inquiries about the model design, model inputs, processes modeled, sensitivity analyses, and the effects of other projects (RAI #1 and RAI #2). The EPA reviewed ExxonMobil's replies and updated information and determined that the modeling approach accurately

predicts, to the extent possible, the extent of the plume and pressure front.

EPA also reviewed ExxonMobil's proposed plan to perform corrective actions to plug non-project wells within the AoR. EPA asked clarifying questions about how ExxonMobil evaluated the need for corrective action in RAI #1 and RAI #2 and determined that ExxonMobil's responses to EPA's questions and updated application submittals demonstrated that corrective action meets the requirements.

Based on its review of the information ExxonMobil provided, the EPA determined that the permit application meets the requirements for the AoR and the Corrective Action Plan.

Underground Sources of Drinking Water (USDWs): The UIC program protects current and future sources of drinking water by defining a USDW broadly. USDWs, by definition under 40 CFR 144.3 and 40 CFR 146.3, include aquifers that currently supply public water supply systems or contain enough groundwater to do so and either 1) currently supply drinking water (e.g., private wells) or 2) contain fewer than 10,000 milligrams per liter (mg/L) of total dissolved solids (TDS). The concentration of TDS is an indicator of whether an aquifer has the potential to be used for drinking water, even if it is not currently being used. Typically, potable water generally contains less than 500 mg/L of TDS. However, an aquifer (or portion of an aquifer) containing up to 10,000 mg/L of TDS is still considered a potential drinking water source. It is therefore protected under the UIC program, even if it is not in use. In this way, the broad definition of USDWs protects both groundwater sources that are currently used for drinking water and those that could be used in the future.

The lowest geologic unit considered to be a USDW in the project area is the Santa Rosa Formation, which contains the Evangeline Aquifer at a depth of 1,415 feet below mean sea level. The EPA reviewed the information submitted in the Site Characterization document regarding the depth to and quality of the lowermost USDW, which is included as part of the administrative record for the Permits.

Protection of USDWs is the stated goal of the UIC program; protection of the USDWs at the Rose project site is supported by all aspects of the permit, from siting (based on numerous geologic, hydrogeologic, seismic, geochemical, and geomechanical considerations) to AoR determination, corrective action, well construction requirements, testing and monitoring, safe operational parameters (maximum injection rate and pressure), emergency and remedial response, plugging and abandonment, post-injection site care, and financial responsibility. Collectively, the permit conditions maintain protective measures for USDWs in the AoR.

Injection and Confining Zone: Requirements under 40 CFR 146.83 define the minimum siting criteria for a Class VI injection well, including an injection zone that will receive the carbon dioxide stream and a confining zone that will contain the injected carbon dioxide. ExxonMobil's permit application provides information on the geology that comprises the injection zone and the confining zone.

EPA reviewed information provided by the permittee including geophysical logs, core analyses, and fluid samples collected in a stratigraphic test well drilled within the AoR, along with logs from wells in the project area, which ExxonMobil used to determine average porosity, permeability, gross thickness, and other properties for injection zone and upper and lower confining zones at the injection site. Additional information includes multiple high-density 3D seismic surveys and 2D seismic lines that cross the project site, as well as information collected through a literature review. This information is documented in Site Characterization (Section 2 of the permit

application, dated May 2025), which is part of the administrative record for the Permits.

Based on this review, EPA has determined that the regional and local geologic features at the site support a determination of site suitability per 40 CFR 146.83, specifically that the injection zones can receive the total volume of carbon dioxide that ExxonMobil proposes to inject without fracturing, and that they are separated from USDWs by a competent confining zone, and with no transmissive faults or fractures. This is based on information ExxonMobil submitted about the lithological, petrophysical, geomechanical, and geochemical properties of the injection zone.

Additionally, the EPA determined that the confining zone would provide a suitable trap to prevent carbon dioxide from moving upward, thereby protecting USDWs from endangerment, as required under 40 CFR 146.83. This is based on information regarding the lithological, petrophysical, geomechanical, and geochemical properties of the upper and lower confining zones, as well as a review of seismic history and seismic risk. The EPA also reviewed water chemistry and data on the solids in the injection zone to determine whether geochemical reactions during injection could alter the ability to inject and the storage capacity (i.e., through changes in porosity and permeability) or cause the release of trace elements.

The EPA reviewed information in the permit application related to fault sealing potential, a fault stability analysis, and other relevant information to determine if the project site meets Class VI requirements regarding containment and any potential risks from faults or fractures. This data includes not only the geologic characteristics of faults but also the geomechanical properties (e.g., rock strength, stresses, and other properties) required at 40 CFR 146.82()(3)(iv). Four faults are identified within the AoR; however, ExxonMobil has provided geologic studies to demonstrate that none of these faults will pose a risk to the containment of the injectate. The EPA has historically raised concerns about the effective analysis of fault sealing mechanisms. Hence, the EPA requested additional information and further clarification from ExxonMobil regarding its characterization of fault sealing in both RAI #1 and RAI #2.

EPA asked questions (in RAI #1 and RAI #2) about the injection and confining zone properties, including the potential for geochemical reactions and ExxonMobil's characterization of fault sealing to ensure that site-specific chemistry is accounted for in predicting plume behavior. EPA determined that ExxonMobil's responses to its questions and updated Site Characterization document addressed all concerns to the EPA's satisfaction. Before the EPA authorizes injection, ExxonMobil will also conduct pre-operational testing (as per 40 CFR 146.87) to provide additional data on the injection and confining zones, thereby verifying the information on which the permit application narrative is based. The specific pre-operational testing required is outlined in Section J and Attachment 6 (Testing and Monitoring Plan) of the permits.

The draft permits limit injection for geologic sequestration to the Fleming and Frio Formations. Injection in the Fleming Formation would be at depths above mean sea level of approximately 3,472 feet to 5,922 feet (Well 1), 3,481 feet to 6,094 feet (Well 2), and 3,382 feet to 5,896 feet (Well 3). Injection into the Frio Formation will occur at depths above mean sea level of approximately 6,938 feet to 7,348 feet (Well 1), 6,933 feet to 8,160 feet (Well 2), and 6,778 feet to 7,986 feet (Well 3). The designated primary confining zone for the project is the Amphistegina 'B' shale, in addition to the Anahuac Shale, and the lower confining zone is the Frio Formation. The primary upper confining zone is separated vertically from the lowermost USDW by approximately 1,170 feet.

Construction Requirements: The regulatory criteria for Class VI well construction are provided at 40 CFR 146.86. All Class VI wells must be constructed with casing and cement that are compatible with the fluids with which they will come into contact. Materials expected to be exposed to carbon dioxide and carbon dioxide/water mixture need to be resistant to corrosion. The wells must also be designed to withstand the stresses due to injection operations.

Class VI wells must be cased and cemented to prevent the movement of fluids into or between USDWs. These wells would be equipped with an automatic surface shut-off system that would shut off the well if any permitted operating parameters, such as injection pressure, diverge from permit limitations. To confirm that the wells are operating within permitted limits and to demonstrate internal mechanical integrity, the wells will be equipped with continuous recording devices to monitor: the injection pressure; the rate, volume and/or mass, and temperature of the carbon dioxide being injected; the pressure on the annulus (space) between the tubing and the long string casing; and the volume of fluid in the annulus addressed in Section I (Well Construction Requirements) of the permits.

EPA reviewed the permit application to determine if the submitted Class VI wells' construction meets these requirements. Specifically, EPA evaluated information on ExxonMobil's construction procedures, casings and cements (including the corrosion-resistance of the materials used), well schematics, mechanical integrity testing procedures, continuous monitoring, and emergency shut-off procedures to determine that they are suitable for carbon dioxide injection at the planned operating conditions and that all casings are set and cemented at depths appropriate to relevant formations (e.g., the lowermost USDW and the injection and confining zones). Based on its review, EPA identified deficiencies in the application related to materials for well construction (including the potential for corrosion of materials and cement) and pre-operational testing and sent questions and comments to ExxonMobil in RAI #1 and RAI #2. The EPA reviewed ExxonMobil's responses and submissions of updated construction details and determined that the construction of the injection wells meets the regulatory criteria at 40 CFR 146.86. ExxonMobil's construction information is part of the administrative record in the Well Construction Plan and Operating Conditions (Section 4 of the permit application). The construction details and testing that ExxonMobil has or will perform before injection are specified in Section I and Attachment 4 (Construction Details) to the permits.

Injection Fluid: The injected fluid will be more than 97% pure carbon dioxide. The carbon dioxide, which will be captured from industrial sources including clean hydrogen, ammonia, direct reduced iron plants, and natural gas treatment facilities, will be sent via pipeline to the proposed carbon sequestration site. The draft permits allow ExxonMobil to inject a maximum of 1.67 million metric tons of carbon dioxide per year into each well, with a total maximum of 5 million metric tons per year across all three injection wells. Over the 13-year injection period, ExxonMobil would be authorized to inject a maximum total of 53 million metric tons of carbon dioxide. EPA also evaluated the carbon dioxide composition in the context of information about the injection zone formation and fluid geochemistry to determine that there would be no adverse reactions that could lead to USDW endangerment. This included an evaluation of the composition and other characteristics of the carbon dioxide stream, and a determination that it is compatible with the proposed well materials (as described under "Construction Requirements") and an evaluation of potential reactions between the carbon dioxide and the rocks and formation fluids (as defined under "Injection and Confining Zone"). EPA asked questions about the carbon dioxide

composition and source in RAI #1 and RAI #2 and reviewed ExxonMobil's responses. Within the Operating Conditions (Section 1.8 of the Introduction to the permit application, dated May 2025), which is part of the administrative record, relevant information is provided about the injection fluid.

Maximum Injection Pressure: The pressure during injection must not initiate fractures in the injection or confining zones, as required under 40 CFR 146.88(a). Such fractures could become conduits for the movement of injection or formation fluids into a USDW, which is prohibited by 40 CFR 146.88(a).

EPA reviewed the proposed maximum injection pressure and found it to be appropriate to the site-specific geomechanical properties of the injection and confining zones and congruent with a required safety factor below that of the calculated site fracture. This information is also incorporated into the computational modeling described under "AoR and Corrective Action." As a result, EPA has determined that the measured maximum bottomhole pressure would be limited to 4,620 pounds per square inch in Well 1; 4,670 pounds per square inch in Well 2; and 4,553 pounds per square inch in Well 3 to ensure that the pressure during injection does not initiate fractures in the injection or confining zones, under 40 CFR 146.88(a). The annulus pressure will be adjusted to be more than 100 psi above the wellhead injection pressure, with a maximum allowable pressure of 2,750 psi. The minimum annulus pressure is 500 psi. As such, the permitted maximum injection pressure is not to exceed 2,650 psi. These limits are contained in Section K and Attachment 1 (Summary of Operating Requirements) to the permits.

Information related to the maximum injection pressure is included in ExxonMobil's AoR and Corrective Action Plan (Section 3 of the permit application, dated May 2025), which is part of the administrative record for the Permits.

Monitoring and Reporting Requirements: The requirements for Class VI well testing and monitoring are found at 40 CFR 146.90. ExxonMobil submitted a Testing and Monitoring Plan and Quality Assurance Surveillance Plan as part of their permit application. EPA reviewed the Testing and Monitoring Plan and requested clarifying information about planned corrosion monitoring, groundwater monitoring, plume and pressure front tracking, and seismic monitoring in RAI #1 and RAI #2. The EPA reviewed ExxonMobil's responses, and an updated Testing and Monitoring Plan was submitted, which was found to meet federal requirements. EPA also reviewed the Quality Assurance and Surveillance Plan and determined that it addresses all testing and monitoring activities to ensure that all testing and monitoring will produce reliable results.

Based on the review, EPA has determined that the Testing and Monitoring Plan meets all requirements. The Testing and Monitoring Plan (Section 5 of the permit application, dated May 2025), which is part of the administrative record for the Permits. The Quality Assurance and Surveillance Plan contains information related to the Testing and Monitoring Plan and is part of the administrative record.

Under the approved Testing and Monitoring Plan, as outlined in Attachment 6 (Testing and Monitoring Plan), ExxonMobil will analyze carbon dioxide at a frequency sufficient to provide information about its chemical and physical characteristics. ExxonMobil would also be required to demonstrate well integrity (i.e., good physical condition) per 40 CFR 146.8 and 146.89, before the EPA would authorize ExxonMobil to start injecting and after injection has been approved. Internal mechanical integrity is demonstrated by an initial pressure test that shows that there are no significant leaks in the casing, tubing, or packer. After injection begins, ExxonMobil must continuously observe and record injection pressure,

flow rate, volume, and annulus pressure to detect any leaks that may develop in the casing, tubing, or packer. In addition, ExxonMobil must initially demonstrate external mechanical integrity (i.e., no movement of fluid along the well behind the casing) using a tracer survey (oxygen activation log), temperature or noise log, and a casing inspection log. After injection begins, the draft permits require ExxonMobil to perform a temperature or noise log or another EPA-approved test every year to detect any fluid movement behind the casing. The draft permits also require ExxonMobil to test the well materials every quarter for signs of corrosion. This will provide an early indication of any degradation of well materials due to contact with carbon dioxide in the presence of water.

The draft permits require ExxonMobil to perform several other types of monitoring to verify that the project and the injected carbon dioxide are behaving as predicted. ExxonMobil must monitor groundwater quality in a geologic formation above the confining zone quarterly during injection operations. This will indicate any changes in water quality, such as changes in pH, major ions, or the mobilization of metals or organic compounds, that could be caused by the leakage of carbon dioxide or fluids from the injection zone.

Pressure fall-off testing must be performed at a minimum of every 5 years to verify that the injection zone is responding to injection as predicted. ExxonMobil must monitor the plume and pressure front directly by continuously recording pressures and temperatures at the three injection wells and an in-zone monitoring well, and indirectly using periodic time-lapse surface seismic surveys. ExxonMobil must collect and evaluate this data to verify that the carbon dioxide plume and pressure front are moving as predicted or to provide an early indication if they are not. ExxonMobil will also use this data to inform AoR reevaluations, as described in the section "AoR and Corrective Action."

ExxonMobil must also monitor seismic activity to determine whether injection operations may be inducing seismic activity as described in Section Q (Seismic Event Response) of the Permit. Should any seismic events occur, ExxonMobil must cease operations and, if necessary, implement the Emergency and Remedial Response Plan (Section 8 of the permit application, dated May 2025), which is part of the administrative record for the Permits. The draft permits also require ExxonMobil to perform surface air or soil gas monitoring if needed, based on the results of other monitoring.

In accordance with 40 CFR 144.54 and 40 CFR 146.91, ExxonMobil must submit the results of this monitoring to the EPA semiannually or within 30 days of completing a mechanical integrity test or other required testing.

Emergency and Remedial Response: The requirements for an Emergency and Remedial Response plan are found at 40 CFR 146.94. ExxonMobil developed and submitted a site-specific Emergency and Remedial Response Plan (Section 8 of the permit application, dated May 2025), which is part of the administrative record for the Permits.

The EPA reviewed the Emergency and Remedial Response Plan, which identifies key resources, including USDWs, a water canal, and infrastructure related to oil and gas exploration and production, agricultural crop production, and undeveloped rural acreage with some residential development.

Based on the review, EPA has determined that the Emergency and Remedial Response Plan meets all requirements. The Emergency and Remedial Response Plan (Section 8 of the permit application, dated May 2025), which is part of the administrative record for the Permits.

The plan, an enforceable part of the permits, Section P and Attachment 9 (Emergency and Remedial Response Plan), describes the responses to be taken in the event of adverse events and identifies the staff and equipment available to support emergency and remedial response events. The emergency and remedial response provisions of the permits will facilitate expedient responses and prevent or mitigate harm to the environment, including USDWs.

Section N (Reporting and Recordkeeping) of the permits requires reporting to EPA within 24 hours of events where the injected carbon dioxide or pressure could cause endangerment to a USDW, such as triggering of a shut-off device, a mechanical integrity failure, possible fluid movement into an unauthorized zone, or evidence of a surface leak.

Financial Responsibility: The requirements for demonstrating and maintaining financial responsibility are found at 40 CFR 146.85. ExxonMobil provided information to demonstrate adequate financial responsibility and outlined its plans to maintain this financial responsibility, including performing all necessary corrective actions on wells in the AoR, plugging the injection wells, providing all required post-injection site care, closing the site, and conducting any necessary emergency and remedial response measures.

EPA reviewed this information, including evaluating whether ExxonMobil's proposed cost estimates were adequate to cover the activities as described in the AoR and Corrective Action Plan, Testing and Monitoring Plan, Well Plugging Plan, PISC, Site Closure Plan, and Emergency and Remedial Response Plan.

The EPA also evaluated the language in ExxonMobil's financial instruments to determine that they included the required conditions (e.g., for continuation, renewal, and cancellation) and are financially secure. The EPA asked clarifying questions in RAI #1 and reviewed the applicant's responses, after which ExxonMobil updated its financial information accordingly. Based on the review, EPA has determined that ExxonMobil meets all requirements for demonstrating and maintaining financial responsibility. See Section H and Attachment 3 (Financial Responsibility Demonstration) for relevant information related to financial responsibility as part of the administrative record.

ExxonMobil will utilize a corporate guarantee to cover costs and demonstrate its financial responsibility for corrective action, well plugging, post-injection site care, site closure, and emergency response. The cost estimates for the covered activities must be updated for inflation within 60 days prior to the anniversary date of the financial instruments' establishment. If there are other updates to the financial responsibility instruments, this information must be submitted on an annual basis. These provisions ensure that resources are available to perform these USDW-protective activities without using public or taxpayer money. The financial responsibility requirements are also located in Section H and Attachment 3 (Financial Responsibility Demonstration) of the permits.

Plugging and Abandonment: The requirements for an Injection Well Plugging Plan are found at 40 CFR 146.92. This plan is a required component of the permit application, which the EPA reviewed. EPA's review of the Injection Well Plugging Plan included an evaluation of ExxonMobil's proposed pre-plugging testing procedures and the cements and plugs to be used (including their resistance to corrosion and their location relative to the lowermost USDW and the injection and confining zones) to demonstrate that ExxonMobil met the Class VI requirements. EPA asked clarifying questions about ExxonMobil's proposed plugging procedures and testing in RAI #1 and RAI #2 and determined that ExxonMobil's responses to EPA's questions and updated application submittals

demonstrated that the wells will be plugged in a USDW protective manner.

Based on the review, EPA has determined that ExxonMobil's Injection Well Plugging Plan meets all requirements. Permit application information related to the Injection Well Plugging Plan (Section 6 of the permit application, dated May 2025) is part of the administrative record.

Section O and Attachment 7 (Well Plugging Plan) of the draft permits outline requirements for environmentally protective well plugging upon cessation of injection operations. The wells would be plugged using approved materials that are compatible with carbon dioxide and water mixtures, ensuring the wells will not serve as a conduit for fluid movement following injection operations.

Post-Injection Site Care and Site Closure: The requirements for Class VI Post-Injection Site Care (PISC) and Site Closure Plans are found in 40 CFR 146.93. This plan is a required component of the permit application, which the EPA reviewed. EPA's review of the PISC and Site Closure Plan included verifying that information about the pre- and post-injection pressure differential and the predicted position of the carbon dioxide plume and associated pressure front at site closure are consistent with the AoR delineation modeling results; that the planned post-injection monitoring is appropriate to provide early warning of USDW endangerment and is consistent with injection-phase monitoring; and that ExxonMobil will plug all monitoring wells and restore the site to its pre-operational condition. EPA asked clarifying questions related to predictions of pressure decline in RAI #1 and determined that ExxonMobil's responses and ExxonMobil's updated PISC and Site Closure Plan addressed the Agency's concerns. Based on the review, EPA has determined that ExxonMobil's PISC and Site Closure Plan meet all requirements. Relevant permit application information related to post-injection site care and site closure is part of the administrative record in ExxonMobil's Post Injection Site Care Plan (Section 7 of the permit application, dated May 2025).

ExxonMobil would be required to implement the approved Post-Injection Site Care (PISC) and Site Closure Plan under Section O and Attachment 8 (Post-Injection Site Care and Site Closure Plan) of the draft permits. Following the cessation of injection, ExxonMobil must continue to monitor groundwater quality and track the position of the carbon dioxide plume and pressure front, as described in the "Monitoring and Reporting Requirements" section above. This monitoring will help confirm predictions about the behavior of the carbon dioxide plume and pressure front (i.e., that pressures should subside after injection ceases) and provide an early indication of potential USDW endangerment. ExxonMobil would continue this post-injection monitoring for at least 50 years. At the end of the PISC period, EPA will authorize site closure if ExxonMobil demonstrates that USDWs are not endangered based on monitoring and other site data. Following authorization to proceed with site closure activities, ExxonMobil would be required to 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 (by removing all surface equipment and planting vegetation).

Compliance with other Federal Statutes: As part of the permit process, pursuant to 40 CFR 144.4, EPA is required to consider other Federal laws, including Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA).

Endangered Species Act

The ESA and its implementing regulations require the EPA to ensure that any action it authorizes does not jeopardize the continued existence of any endangered or threatened species (i.e., listed) or

adversely affect their critical habitat. After reviewing the best available science, EPA, via a Designated Non-Federal Representative, determined that Exxon's proposed project may affect, but is not likely to adversely affect, two listed species that could occur in areas potentially impacted by the project. The EPA has received concurrence on this determination from the U.S. Fish and Wildlife Service and has concluded the Section 7 informal consultation.

National Historic Preservation Act

The NHPA and its implementing regulations require EPA to consider the effects of its undertakings on historic properties. Because issuance of a UIC permit is a federal undertaking, EPA is consulting with the Texas State Historic Preservation Office (SHPO) and interested tribal governments. As part of that effort, EPA, via a Designated Non-Federal Representative, provided the SHPO and tribes with a description of the project, the area of potential effect, and the steps taken to identify historic properties. The EPA expects to determine that no historic properties will be affected by this undertaking.

Issuance and Effective Date of Permits: Under 40 CFR 124.15, the permits would become effective immediately upon issuance if no public comments were received requesting a change to the draft permits. However, if public comments are received and the EPA decides to issue final permits, the permits would become effective 30 days after the date of issuance, unless a different effective date is specified in the decision or the permits are appealed.

According to 40 CFR 144.36(a), the permits would remain in effect for the duration of the project, unless they are otherwise modified, revoked, reissued, or terminated as specified in 40 CFR 144.39, 144.40, and 144.41. The permits will expire in two years if ExxonMobil fails to satisfy any additional requirements mandated by the permits to obtain authorization to inject from the EPA, unless the EPA approves a written request for an extension of the two-year period. Authorization to inject under the permits may be granted following well construction and compliance with additional requirements as outlined in the permits and regulations at 40 CFR 146.82, 146.86, 146.87, and 146.89.

Figure 1. Area of Review (AoR)