



Underground Injection Control – Class VI Permit Application for

Cronos No. 1 and Rhea No. 1

Jefferson County, Texas

SECTION 9 – FINANCIAL ASSURANCE

February 2024



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9.1 Facility Information

Facility Name: Titan Carbon Sequestration Project

Facility Contact: [REDACTED]

Project Site Name: Titan Carbon Sequestration Project

Project Location: Jefferson County, Texas

Cronos No. 1

Rhea No. 1

9.2 Introduction

Under Texas Administrative Code (TAC) Title 16 **§5.205** [Title 40, U.S. Code of Federal Regulations (40 CFR) **§146.85**], owners or operators of carbon sequestration wells are required to demonstrate financial responsibility for associated activities. Titan Carbon Sequestration, LLC (Titan) plans to construct two Class VI injection wells, Cronos No. 1 and Rhea No. 1, for the purpose of sequestering up to a total of [REDACTED] million metric tons per year (MMT/yr) of CO₂ at the Titan property. Consistent with these regulatory requirements, Titan has prepared this document to demonstrate financial responsibility for the injection wells that comprise the Titan Carbon Sequestration Project (Titan Project) site.

The sections that follow summarize the Titan Project site's sequestration activities, as well as the qualifying financial instrument that Titan proposes to use, to demonstrate financial responsibility for the following carbon capture and sequestration (CCS) project phases: (1) Corrective Action; (2) Injection Well Plugging; (3) Post-Injection Site Care and Site Closure; and (4) Emergency and Remedial Response.

9.3 Financial Assurance Demonstration

Per 40 CFR **§146.85(a)(1)(vii)**, Titan requests approval from the Underground Injection Control (UIC) Program Director (UIC Director), or their designee, to use a corporate guarantee from surety bonds for the purposes of demonstrating financial responsibility for Corrective Action, Injection Well Plugging, and Post-Injection Site Care (PISC) and Site Closure, as well as Emergency and Remedial Response (ERR).

9.3.1 Estimated Coverage Amounts

The total current cost estimate for all sequestration activities necessitating financial assurance at the Titan Project site is [REDACTED] in 2024 dollars. This total cost estimate assumes the hiring of independent, third-party contractors for key activities, and can be separated into the following project phases:

1. Corrective Action (completed prior to initial injection)
2. Well Plugging: after injection ceases and wells are no longer in use for PISC monitoring
3. PISC: beginning when injection ceases and continuing for 50 years until site closure
4. ERRP: beginning with initial development operations and continuing for 50 years until site closure

Table 9-1 summarizes the total estimated project costs by activity. The values included in this demonstration of financial responsibility are based on cost estimates developed as part of the permit application process. Also, the values assume the hiring of third-party contractors to perform the services or to procure the goods associated with the performance of each type of activity. These values are subject to change during the project to account for inflation of costs as well as changes to the project that may affect the cost of covered activities. In accordance with 16 TAC §5.205(c)(2) [40 CFR §146.85(c)], Titan will adjust the value of its financial assurance instruments in response to any changes in cost estimates and will resubmit its demonstration of financial responsibility to the UIC Director or their designee for review and approval. Titan will not adjust the established coverage values of any financial assurance instrument without prior approval from the UIC Director or their designee.

Table 9-1 – Summary of Geologic Sequestration Activity Project Costs

Activity	Cost
Corrective Action	N/A
Well Plugging	[REDACTED]
Post-Injection Site Care and Site Closure	[REDACTED]
Emergency and Remedial Response	[REDACTED]
TOTAL	[REDACTED]

9.4 Corrective Action

The Corrective Action Plan is discussed in detail in *Section 3 – Area of Review and Corrective Action Plan*. The plan specifically outlines both a plugging plan, for the wells found within the critical pressure front and CO₂ pore-occupancy plume, and the recompletion schedule whereby the wellbore modifications will have been completed.

For the planned activities at the Titan Project site, workovers on all wells requiring plugging modifications will have been completed prior to injection. As such, there is no financial risk for these recompleted wells.

The area of review (AOR) will be reevaluated every 5 years to determine if any additional penetrations will be impacted.

9.5 Well Plugging

9.5.1 Injection Well Plugging

Plugging and abandonment (P&A) of the injection wells at the Titan Project site will meet the requirements of 16 TAC §5.203(k) [40 CFR §146.92]. The P&A of the injection wells will be designed so that no movement of fluids will occur from the injection interval. A more detailed P&A plan is discussed in *Section 6 – Plugging Plan*. The funds for plugging include costs for logs/wireline to be run in the wellbore before cementing occurs. Acid-resistant cement will be used in the initial plug for the well, to ensure that the cement does not react with the injected fluid—resulting in a potentially higher cement expense than traditional cement. All expenses relating to personnel and equipment have been accounted for in Table 9-2. Pressure test costs are also included to account for proving the integrity of the well.

9.5.2 Monitoring Well Plugging

The P&A of the monitoring wells associated with the Titan Project site will also meet the requirements of 16 TAC §5.203(k) [40 CFR §146.92]. The P&A of these shallow monitoring wells will be designed so that no movement of fluids will occur from the injection interval, nor will fresh, treatable water found within the USDW be threatened. (As noted, a more detailed P&A plan is discussed in *Section 6 – Plugging Plan*.) Because these wells will be completed above the uppermost confining geologic interval, conventional plugging procedures will be utilized. These funds include costs for logs and wireline to be run in the wellbore before cementing occurs. All expenses relating to personnel and equipment have been accounted for in Table 9-2. Pressure test costs are also included to account for proving the integrity of the well.

Table 9-2 – Summary of Well Plugging Costs Associated with Financial Security

Activity	Cost Per Well	Total
<i>Injection Well Plugging (two wells)</i>		
Workover Rig		
Kill/Buffer Fluid		
Personnel		
Wireline		
Downhole Tools		

Activity	Cost Per Well	Total
Other Services		
Cement and Pumping Services		
Equipment Rentals		
<i>Above-Zone Monitoring Well Plugging (two wells)</i>		
Workover Rig		
Kill/Buffer Fluid		
Personnel		
Wireline		
Downhole Tools		
Other Services		
Cement and Pumping Services		
Equipment Rentals		
<i>USDW Monitoring Well Plugging (two wells)</i>		
Workover Rig		
Cement Services		
Auxiliary Services		
TOTAL		

9.6 Post-Injection Site Care and Site Closure

The PISC and Site Closure Plan will be designed to meet the requirements of 16 TAC §5.206(k) [40 CFR §146.93]. The costs associated with the plan are highlighted in Table 9-3, while the plan itself is discussed in *Section 7 – Post-Injection Site Care and Site Closure Plan*.

9.6.1 Post-Injection Monitoring

As discussed in *Section 5 – Testing and Monitoring Plan*, vertical seismic profile (VSP) monitoring will be conducted after the end of injection to ensure the integrity of the well and to track the migration of the plume.

9.6.2 Site Closure

Site closure will occur when the UIC Director has released the owner from all PISC duties. The costs estimated in Table 9-3 reflect the amount expected to decommission and close the site.

Table 9-3 – Summary of PISC/Site Closure Costs Associated with Financial Security

Activity	Cost	Total
Post-Injection Monitoring		
Indirect Plume Monitoring (VSP)		
Other Monitoring (e.g., fluid sampling and analysis, pressure/temperature monitoring)		
Site Closure		
TOTAL		

Indirect plume monitoring (VSP or seismic survey) will be run every 5 years throughout the PISC period, or as agreed to with the UIC director—based on actual plume measurements or until the plume has been determined to have stabilized. The VSP costs are estimated at [REDACTED] per well and occurring every 5 years during the PISC period. Other monitoring costs such as pressure/temperature monitoring, fluid sampling, etc., are estimated to be [REDACTED] per year for 50 years.

9.7 Emergency and Remedial Response

The Emergency and Remedial Response Plan (ERRP) is discussed in *Section 8 – Emergency and Remedial Response Plan* and designed to be in compliance with 16 TAC §5.203(l) [40 CFR §146.94].

The resultant cost for the EERP is [REDACTED] in 2024 dollars. This cost assumes coverage for the Titan Project site, including the following risks: water quality impact, CO₂ migration, entrained contaminant (non-CO₂) in the injection stream, and accidents/unplanned events (typical insurable events). Details regarding these cost estimates are explained in *Section 8*.

9.8 Conclusion

State and federal regulations require that the owner and operator of the two proposed Class VI wells demonstrate financial responsibility for the Titan Project site. The information contained in this section displays the instruments that Titan will use to prove their financial assurance to properly execute operations and uphold regulations throughout the life of the project. The owner and operator will secure the appropriate financial assurance instrument(s) prior to beginning construction of the project. These documents, in addition to the information contained in this section, fulfill Titan's responsibilities to ensure financial assurance.