



Underground Injection Control – Class VI Permit Application for

Orchard No. 1 to No. 7

Section 9 – Financial Assurance Plan

Gaines County, Texas

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SECTION 9 – FINANCIAL ASSURANCE

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9.1 Financial Responsibility

To meet the requirements of 16 Texas Administrative Code (TAC) **§5.205** [Title 40, U.S. Code of Federal Regulations (40 CFR) **§146.82(a)(14)** and **§146.85(a)**], this section was prepared to summarize actions that Orchard Storage Company LLC (Orchard Storage) will take to demonstrate financial responsibility for injection well plugging, post-injection site care (PISC) and site closure, and emergency and remedial response. This section also provides cost estimates to conduct these activities on a project basis. The costs included account for the proposed seven Class VI injection wells plus monitoring wells (Orchard Project), within the pressure front area of review (AOR).

Orchard Storage will annually provide to the Underground Injection Control (UIC) Director evidence of financial responsibility as required by 16 TAC **§5.205** [40 CFR **§146.85**]. This ensures that Orchard Storage has enough financial resources to cover corrective action, injection well plugging, PISC and site closure, and emergency and remedial response, if financial difficulties are encountered. This annual report will be submitted until the UIC Director has determined that the facility has reached the end of the PISC period. The following financial information will account for the entire AOR and be submitted to aid in the UIC Director's determination of financial responsibility:

- The most recent audited annual report filed with the U.S. Securities and Exchange Commission under Section 13 or 15(d), Securities Exchange Act of 1934 (15 U.S.C. Section 78m or 78o(d))
- The most recent quarterly report filed with the U.S. Securities and Exchange Commission under Section 13 or 15(d), Securities Exchange Act of 1934 (15 U.S.C. Section 78m or 78o(d))
- The operator's most recently audited financial statements, if the person is not required to file a report with the U.S. Securities and Exchange Commission

9.2 Financial Assurance

As required by 16 TAC **§5.205** [40 CFR **§146.85**], the following financial instruments will be secured and used to provide sufficient funding for the following activities:

- Corrective Action – Bond
- Injection Well Plugging – Bond
- Post-Injection Site Care and Site Closure – Insurance
- Emergency and Remedial Response – Insurance

Alliant Insurance Services has confirmed that Orchard Storage will be able to obtain these instruments, per the letter provided in *Appendix H*.

Table 9-1 summarizes the cost estimates for those activities—estimates that will be revised annually and account for any changes in the AOR, Emergency and Remedial Response Plan, and Injection Well Plugging Plan.

Table 9-1 – Summary of Costs Associated with Financial Security

Financial Assurance Item	Unit Cost	# of Wells	Total
Corrective Action (Project Total)			
Plugging Costs (per well x 8)			
Injection Well Plugging (Project Total)			
Workover Rig			
Rental Tools			
Mud/Brine			
Fracture Tanks			
Wireline			
Final Mechanical Integrity Test and Casing Logs			
Cement			
Bridge Plugs/Packers			
Casing Crew			
Miscellaneous			
Post-Injection Site Care and Site Closure			
Vertical Seismic Profile Surveys			
Groundwater and Soil Monitoring			
Operations and Maintenance of Monitoring Wells			
Monitoring Well Plugging			
Subsurface Facilities Closure			
Emergency and Remedial Response			
Deep Oil-and-Gas Well Leak			
CO ₂ Injection Well Leak			
Deep CO ₂ Monitoring Well Leak			
Rapid Leakage Through Caprock			
Slow Leakage Through Caprock			
Release Through Existing Faults			
Release Through Induced Faults			

This instrument will remain in effect until site closure. The financial instrument will, at a minimum, contain provisions for cancelation, renewal, and continuation. If Orchard Storage faces adverse economic conditions, it will notify the Commission and file a bankruptcy notice via certified mail to the UIC Director.

9.3 Corrective Action Plan

[REDACTED] in the pressure front AOR will require corrective action. The cost to reenter and properly plug the [REDACTED] identified is estimated to be [REDACTED] per well. As required by 16 TAC §5.206(g)(1) [40 CFR 146.84(e)], the AOR will be reevaluated every 5 years to determine if any new penetrations have occurred.

9.4 Injection Well Plugging and Abandonment

Plugging and abandonment (P&A) procedures for the Orchard Project injection wells were prepared to meet the requirements of 16 TAC **§5.203(k)** [40 CFR **§146.92**]. These plans are intended to ensure that the wells do not serve as migration pathways of the injected fluid from the storage formation and into the Underground Source of Drinking Water (USDW), following the cessation of injection operations and after site closure. A detailed P&A plan is discussed in *Section 6 – Injection Well Plugging Plan* in addition to the itemized list of cost estimates just provided in Table 9-1. Funds will be guaranteed to ensure that P&A operations are effectively managed.

9.5 Monitoring Well Plugging and Abandonment

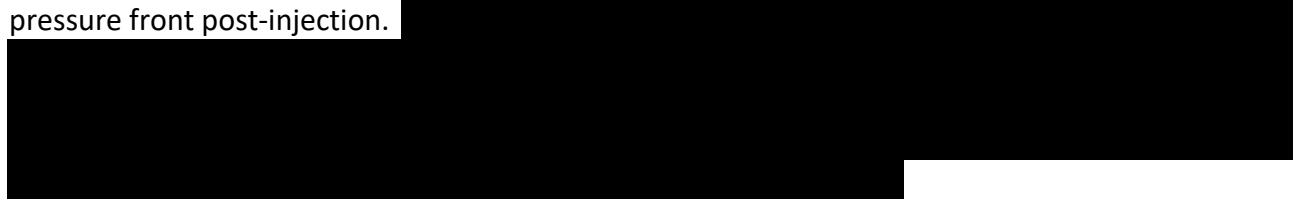
The P&A procedures for the three Orchard Project monitoring wells were prepared to meet the requirements of 16 TAC **§5.203(k)** [40 CFR **§146.92**]. As noted, a more detailed P&A plan is discussed in *Section 6* and all expenses relating to personnel and equipment were accounted for in Table 9-1. Pressure-test costs are also included to prove the integrity of the wells.

9.6 Post-Injection Site Care and Site Closure

The PISC and Site Closure Plan—discussed in *Section 7* and its associated costs just highlighted in Table 9-1—was designed to meet the requirements of 16 TAC **§5.206 (k)** [40 CFR **§146.93**].

9.6.1 Post-Injection Monitoring

The collection monitoring information will be used to confirm the protection of the USDW during post-injection activities, to support the final demonstration of non-endangerment. The associated cost in Table 9-1 accounts for performing groundwater monitoring and tracking the CO₂ plume and pressure front post-injection.



9.6.2 Site Closure

Site closure will occur when the UIC Director has released the owner from all post-injection site duties. The cost estimates given in Table 9-1 reflect the expected amount to close the site and restore the facility to its natural state—including dismantling surface facilities (removing storage vessels, piping, pumps, surface equipment, etc.). Concrete and debris removal is also included in the surface facilities costs. Funds will be allocated for site restoration to leave a minimal environmental impact.

9.7 Emergency and Remedial Response Plan

The Emergency and Remedial Response Plan detailed in *Section 8* was prepared to meet the requirements of 16 TAC §5.206(h) [40 CFR §146.94]. Monte Carlo analysis, risk-based, probabilistic modeling has been tailored to Orchard Project-specific risks and uncertainties, to (1) generate reasonable, upper-bound estimates of the ERR costs—and (2) provide a sensible, conservative, and objective basis for determining the face amount of the financial assurance instrument(s) necessary to support the Class VI permit.

The cost-estimation method applied to the Orchard Project is based on a peer-reviewed (Trabucchi et al., 2014) probabilistic approach—a model reflective of site-specific factors associated with the project. Specifically, the model's input parameters include the geologic location and specific chemical composition of the CO₂ stream, as well as site-specific conditions that exist within the established AOR. The analysis adopts several conservative input assumptions and incorporates probabilistic calculations that allow for multiple release incidents through operation and post-injection site care. The annual probability values that were shown in Table 8-2 are derived from the FutureGen Project Environmental Impact Statement and associated database (DOE Office of NEPA Policy and Compliance, 2007). Furthermore, the cost estimates are based upon response actions that are generally accepted and commonly used to respond to contamination incidents that could impair the public's ability to safely access USDWs.

Based on a model run of 50,000 Monte Carlo trials and the addition of a [REDACTED]

[REDACTED] the upper-bound cost estimate to satisfy ERR is estimated to be [REDACTED] *in 2023 dollars*. This estimate specifically accounts for an array of possible risk events of potential concern as was identified in Table 8-2. Table 8-3 summarizes the statistical results of the Monte Carlo simulations. [REDACTED]

Table 9-2 – Monte Carlo Analysis Summary

Summary Statistic	Cost	# of Events Occurring
Average	[REDACTED]	[REDACTED]
Median	[REDACTED]	[REDACTED]
Standard Deviation	[REDACTED]	[REDACTED]
5 th Percentile	[REDACTED]	[REDACTED]
95 th Percentile	[REDACTED]	[REDACTED]
99 th Percentile	[REDACTED]	[REDACTED]
Minimum	[REDACTED]	[REDACTED]
Maximum	[REDACTED]	[REDACTED]

9.8 Updates to Financial Assurance

As required by 16 TAC **§5.205(c)(2)(E)** [40 CFR **§146.85(c)**], Orchard Storage will, during the active life of this project, adjust the cost estimate for inflation within 60 days before the anniversary date of the establishment of the bond and insurance products—and provide this adjustment to the UIC Director. Orchard Storage will also provide written updates of adjustments to the cost estimates within 60 days of any amendments to the AOR and Corrective Action Plan, the Injection Well Plugging Plan, the PISC and Site Closure Plan, and the Emergency and Remedial Response Plan.

If the updated cost estimate increases to an amount greater than the face value of the bond and insurance products in use, Orchard Storage will obtain an increase in the requisite financial instruments at an amount at least equal to the current cost estimate—or get other financial instruments to cover the increase and supply evidence of such to the UIC Director. If the estimated value is reduced due to changes in the operational cycle of the project, the bond will be reduced in value accordingly.