



ATTACHMENT B

Financial Assurance and Responsibility Demonstration

Gulf Coast Sequestration, LLC (G1037)

Project Minerva, Cameron Parish
Minerva South CCS Well Nos. 001 & 002

EPA Project Id: R06-LA-0002

LDENR Appl Nos: 45031 & 45032

Date: November 2024

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FACILITY INFORMATION

Facility Name: Minerva Facility

Injector Wells: Minerva South CCS Well No. 001 (MS CCS 1)
Minerva South CCS Well No. 002 (MS CCS 2)

Facility Contact: David Cook, CEO
5599 San Felipe St., Ste. 1450, Houston, Texas 77056
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Well Locations: Sec 3, T12S, R13W, Cameron Parish, Louisiana
MS CCS 1 (NAD 1927)
Surface: 30° 02' 34.10" W, -93° 40' 20.63" N
Bottom-Hole: 30° 02' 34.10" W, -93° 40' 20.63" N
MS CCS 2 (NAD 1927)
Surface: 30° 02' 33.84" W, -93° 40' 20.48" N
Bottom-Hole: 30° 02' 13.74" W, -93° 40' 42.07" N

1 INTRODUCTION

Gulf Coast Sequestration, LLC (GCS) is providing financial responsibility pursuant to LAC 43:XVII §3609.C. Project Minerva is using a surety bond and insurance (Financial Instruments) to cover the costs of: corrective action, post-injection site care, and site closure, injection well plugging, emergency and remedial response. The estimated costs of each of these activities, as provided by GCS, are presented in Table B.1-1.

The Financial Instruments chosen by GCS and accepted by the Louisiana Department of Energy and Natural Resource (LDENR) Commissioner of Conservation (Commissioner) will come into effect prior to injection activities and will remain in effect until the Commissioner has approved the post-injection site care plan and approved the site closure.

The Financial Instruments will contain protective conditions of coverage such as cancellation, renewal, and continuation provisions to the satisfaction of the Commissioner.

GCS will provide updated information related to their financial responsibility (assurance) instruments on an annual basis and if there are any changes, the Commissioner will evaluate, within a reasonable time, the financial responsibility demonstration to confirm that the Financial Instruments used remain suitable for use. GCS will maintain financial responsibility (assurance) requirements throughout the Commissioner's review of the annual or periodic changes.

During the active life of the geologic sequestration project, GCS will adjust the cost estimate for inflation and any project amendments within 60 days prior to the anniversary date of the establishment of the Financial Instrument(s) and provide this adjustment to the Commissioner. The Commissioner has the right to determine if a cost adjustment is necessary and will inform GCS with 60 days' notice to adjust the value of the Financial

Instruments.

2 COST ESTIMATES

2.1 COST ESTIMATES OVERVIEW

GCS engaged an independent third party, Numeric Solutions (Numeric) to provide cost estimates for the categories listed in Table B.1-1. Founded in 2000, Numeric specializes in delivering comprehensive technical and financial services for CCS, Oil & Gas, and Water Resource Management projects. Numeric's expertise spans the full lifecycle of CCS project development—from scoping and feasibility to well engineering and regulatory compliance. With a strong foundation in upstream oil & gas exploration and development, they bring extensive knowledge of subsurface characterization, petroleum engineering, and regulatory frameworks.

The supporting information and documentation on the individual plans are included in the respective attachments for each category which have been separately submitted with the Class VI permit application. In addition, cost estimate information for each phase, along with the cost in 2024 dollars, and the approximate year of implementation are summarized in Table B.1-1.

The Financial Instruments approved by the Commissioner will satisfy the financial responsibility requirements independently of GCS's financial strength or performance. The Financial Instruments will be sourced from the providers that are signatories to the letters in Appendices B-I and B-II. The providers of the instruments chosen have been vetted for financial strength based upon credit ratings and other available data.

2.2 FINANCIAL INSTRUMENT DETAILS

Injection Well Plugging, and Post-Injection Site Monitoring, Care and Site Closure will be covered by the Financial Instrument provided in Appendix B-I, along with the details of the provider, their Financial Strength Rating, and Long-Term Issuer Credit Rating.

The Financial Instrument comprises protective conditions of coverage including: cancellation, renewal, and continuation provisions; specifications on when the provider becomes liable following a notice of cancellation if there is a failure to renew with a new qualifying financial instrument; and requirements for the provider to meet a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable (LAC 43:XVII §3609.C.1.a-e).

At least 60 days prior to the planned issuance date of the draft Permit to Construct, GCS will engage institution issuing the Financial Instrument to finalize the documentation. The Financial Instrument will be issued by a financial institution authorized under state or federal law to operate in the State of Louisiana. GCS understands that LDENR will not issue the draft Permit to Construct until the performance bond and standby trust are in place.

The following phases will be covered by the Financial Instrument: Corrective Action, Injection Well Plugging, and Post-Injection Site Care and Site Closure. The estimated costs

for these phases are presented in Table B.1-1; the total estimate proposed for assurance is **\$9,292,212**. The following sections detail the considerations made in estimating the costs associated with each phase and tables summarizing the estimates. These costs were developed by Numeric or were solicited from third party vendors and were reviewed by Numeric.

2.2.1 Corrective Action

As demonstrated in the Area of Review (AoR) and Corrective Action Plan (Attachment A), there are no artificial penetrations or known pathways for vertical fluid or pressure migration in the delineated AoR. Therefore, there are no corrective action costs projected for Project Minerva. If there are changes to the delineated AoR that require corrective action, GCS will notify the Commissioner within 60 days of the amendment to the AoR and Corrective Action Plan per LAC 43:XVII §3609.C.4.h.ii. GCS will coordinate with the Commissioner to determine any potential adjustments to the Financial Instruments that may be required.

2.2.2 Injection Well Plugging

The injection well plugging costs includes estimates of the following actions described in the Injection Well Plugging Plan (Attachment E):

- Flushing the wells with a buffer fluid;
- Performing appropriate tests to measure bottomhole reservoir pressure and a final external mechanical integrity test (MIT) to evaluate the integrity of the existing casing and cement that will remain in the ground after the well is plugged; and
- Emplacing plugs made of any material (e.g., cement) compatible with the fluids with which they may come into contact over all or part of the well, with special care taken to seal drinking water zones.

The cost for flushing each injection well, Minerva South CSS No. 001 (MS CCS 1) and Minerva South CCS No. 002 (MS CCS 2), was estimated based on the well designs included in the Injection Well Plugging Plan (Attachment E). No additional costs are anticipated for the future determination of bottomhole pressure or the confirmation of external mechanical integrity, as gauges and fiber included in the well construction section will provide this information prior to the commencement of plugging operations. Table B.2.2-1 summarizes the cost of flushing the injection wells and performing MITs and Table B.2.2-2 summarizes the cost of plugging the injection wells. Appendix B-III includes the detailed estimations used to calculate the proposed injection well plugging costs.

The total cost to plug the injection wells is summarized in Table B.2.2-3 and totals **\$2,441,359**.

2.2.3 Post-Injection Site Care and Site Closure

Post-Injection Site Care

Costs associated with post-injection site care include the cost of monitoring/tracking the plume as identified in the proposed Post-Injection Site Care and Site Closure Plan

(Attachment F). The monitoring includes:

- Geochemical sampling and analysis of ground water samples;
- Tracking the pressure front after injection ceases; and
- Determining the extent of the carbon dioxide plume using indirect geophysical methods.

Table B.2.2-4 provides cost estimates of geochemical sampling the above confining zone monitoring wells, Minerva South USDW Well Nos. 001 and 002 (MS USDW 1 and 2), and CO₂ and pressure monitoring in the in-zone monitoring well, Minerva South In-Zone Well No. 001 (MS IZ 1). Table B.2.2-5 summarizes estimates of the geophysical monitoring costs associated with tracking the plume. Appendix B-IV includes the detailed estimations used to calculate the seismic monitoring.

The total cost for post-injection site care is summarized in Table B.2.2-6 and totals **\$6,474,325**.

Site Closure

Costs associated with site closure include the following activities identified in the Post-Injection Site Care and Site Closure Plan (Attachment F):

- Performing a non-endangerment demonstration; and
- Plugging monitoring wells.

Table B.2.2-7 provides cost estimates for preparing a non-endangerment demonstration, which includes analyzing the data collected during the post-injection surveillance period, such as geochemical analysis interpretation, pressure monitoring results, PN logging trends, and seismic interpretation. Table B.2.2-8 summarizes cost estimates for plugging the above confining zone monitoring wells, MS USDW 1 and 2, and the in-zone monitoring well, MS IZ 1. Appendix B-IV includes the detailed estimations used to calculate monitoring well plugging activities. Total cost for site closure is summarized in Table B.2.2-9 and totals **\$376,528**.

2.3 INSURANCE DETAILS

The Emergency and Remedial Response for Project Minerva will be covered by an insurance policy documented in Appendix B-II, along with the details of the provider, their Financial Strength Rating, and Long-Term Issuer Credit Rating. The policy will sufficiently cover responses to any emergency and performance of any remedial action that meets the requirements of LAC 43:XVII §3623.

In the event that GCS or a third-party provider of a financial responsibility becomes insolvent, GCS will notify the Commissioner by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming GCS as debtor, within 10 days after commencement of the proceeding.

2.3.1 Emergency and Remedial Response Plan

Emergency and Remedial Response (ERR) Plan (Attachment F) is designed to ensure the protection of underground sources of drinking water (USDW) by identifying risk scenarios associated with the injection of CO₂. The risk scenarios include response actions associated with events that impact the surface facilities or injection and monitoring well (Table B.2.3-1), and remedial actions required to address endangerment to the USDW (Table B.2.3-2). The total emergency and remedial response estimate for coverage is **\$6,807,739** and is summarized in Table B.2.3-3.

Surface Facilities, Injection Wells, and Monitoring wells

The following remedial actions were identified as responses associated with surface facilities and the injection and monitoring wells:

- Injection or monitoring well integrity failure interventions
- Replacement of monitoring equipment in the injection wells
- Remediation of roads and facilities in the event of a natural disaster
- Mechanical integrity testing in the event of seismic activity

The cost estimates to respond to these scenarios are provided in Table B.2.3-1.

USDW Endangerment

The cost estimate for a brine or CO₂ release considered the response actions associated with the following scenarios:

- A sudden, fast, short-lived release of brine or CO₂, as seen in the case of a well failure during injection or a sudden blowout.
- Slower, more gradual leaks, occurring along undetected faults, fractures, or well linings. Found in the shallow groundwater supplies to affected residents.

The rationale for responding to these scenarios is provided in the sections below and the cost estimate is provided in Table B.2.3-2.

Water Source Wells Within the AoR

There is one active water source well within the AoR for the project. Water replacement is a short-term solution for groundwater contamination events where local water is produced from wells for consumption and household use. Replacement water costs for 30 days of water use, and the necessary equipment were considered for these costs. As a long-term solution (greater than 30 days, but prior to confirmation of non-endangerment of the USDW) costs were assessed for water filtration. The costs included specifically consider reverse osmosis, which is a practical solution for numerous types of water contamination and the most likely solution to be employed if the underground drinking water were adversely impacted by a release from the injection zone into the groundwater.

Water Resources

In the event of a fluid release from the wellhead of the injection well(s) into the water table, subsequent actions would depend on the specific circumstances of the event. Typically, contamination of drinking water is assessed by sampling water from various wells to determine the severity and direction of contamination. Leakage of carbon dioxide into the water table does not inherently pose a risk to human consumption; CO₂ is commonly found in carbonated beverages and does not pose a direct health risk. However, the primary threat to groundwater arises from other components of the injectate stream or due to the decrease in pH caused by carbonic acid formation when CO₂ reacts with water. Specific remediation measures will depend on the extent and type of impact on the water source, the urgency of remediation required, and the site's compatibility with available remediation technologies.

Costs have been included for the following testing, monitoring, studying, and remediation activities:

- Construction of additional groundwater wells for testing
- Water sampling and geochemical analysis
- Water study and remediation engineering
- Remediation of contamination


Table B.1-1 Cost Estimates for Activities Covered by Financial Instruments

Activity	Table	Year of Implementation (yrs after inj starts)	Total Cost (\$) (2024)
Surety Bond			
Corrective Action	NA	NA	\$0
Plugging Injection Wells	B.2.2-3	~31-33	\$2,441,359
Post-Injection Site Care	B.2.2-6	~80	\$6,474,325
Site Closure	B.2.2-9	~80-85	\$376,528
Surety Bond Amount:			\$9,292,212
Insurance			
Emergency and Remedial Response	B.2.3-2	NA	\$6,807,739
Insurance Coverage:			\$6,807,739


Table B.2.2-1 Cost Summary of Flushing Injection Wells and Performing the MIT

Activity	A Cost per ft	B Avg Well Depth(ft)	C No. of Wells (ft)	Cost Estimate Total = A*B*C
Pre-Plugging Activities				
Flush Injection Wells	\$5.61	11,090	2	\$124,376
Bottom Hole Pressure	no additional costs are anticipated for this pre-plugging activity			
External MIT	no additional costs are anticipated for this pre-plugging activity			
Total Cost Estimate				\$124,376

Note: Detailed estimation provided in Appendix B-III.


Table B.2.2-2 Cost Summary of Injection Well Plugging

Activity	A	B	C	D	Cost Estimate
	Base Cost	Cost Per Plug	Avg. No. of Plugs	No. of Inj Wells	Total = A (sum) +(B*C*D)
Plug Injection Wells (MS CCS 1 and MS CCS 2)					
Labor	\$319,114	\$145,006	5	2	\$2,316,983
Equipment	\$507,809	-	-	-	-
Mobilization	\$40,000	-	-	-	-
Total Cost Estimate					\$2,316,983

Note: Detailed estimation provided in Appendix B-III.



Table B.2.2-3 Total Costs to Plug Injection Wells

Activity	Cost Estimate
Cost to flush well and perform reservoir pressure test and MIT (Table B.2.2-1)	\$124,376
Cost to plug injection wells (Table B.2.2-2)	\$2,316,983
Total	\$2,441,359


Table B.2.2-4 Cost Estimation for Geochemical Sampling and Pressure Monitoring

Activity	A	B	C	Cost Estimate
	Base Cost	Avg Cost per Well	No. of Mon Wells	Total = A (sum) +(B*C)
Geochemical Sampling (MS USDW 1 & 2, per sampling period, every 5 years for 50 years)				
Contractor/Labor	\$8,000	\$4,900	2	\$32,455
Equipment	\$1,500	-	-	-
Mobilization	-	-	-	-
Sample Collection (Formation Testers, U-Tubes, containers, etc)	-	-	-	-
Analysis (on-site/ laboratory)	\$3,155	-	-	-
Report Generation	\$10,000	-	-	-
Pressure Monitoring (MS IZ 1, per year for first 3 years)				
Contractor/Labor (\$/year)	\$5,520	-	1	\$5,520
PN Logging (MS IZ 1, per log run, every 5 years for 50 years)				
Contractor/Labor	-	\$40,000	1	\$64,000
Equipment	\$14,000	-	-	-
Mobilization	\$10,000	-	-	-
Total Cost Estimate for 50 year period				\$981,110
8 sets of additional Geochemical Sampling Periods				\$259,640
Total Cost Estimate for 50 year period (including 8 additional samples)				\$1,240,750

Note: Estimation by Numeric Solutions.



Table B.2.2-5 Cost Summary of Geophysical Monitoring Costs

Activity	A	Units	B	Cost Estimate
	Base Cost		Frequency	Total = A *B
Post Injection Site Care: Geophysical Monitoring Costs				
2D Seismic (Project AoR) (\$/survey)	\$1,744,525	\$/survey	3 occurrences	\$5,233,575
Total Cost Estimate				\$5,233,575

Note: Detailed estimation provided in Appendix B-IV.



Table B.2.2-6 Total Cost of Post-Injection Site Care	
Activity	Cost Estimate
Geochemical Sampling and Pressure Monitoring Costs (from Table B.2.2-4)	\$1,240,750
Geophysical Monitoring Costs (from Table B.2.2-5)	\$5,233,575
Total Cost Estimate	\$6,474,325


Table B.2.2-7 Cost Estimation to Demonstrate Non-Endangerment

Activity	Cost Estimate
Geochemical Analysis Interpretation	\$30,000
Pressure Monitoring	\$25,000
PN Logging	\$20,000
VSP Interpretation	\$30,000
2D Seismic Interpretation	\$40,000
Total Cost Estimate	\$145,000

Note: Estimation by Numeric Solutions.


Table B.2.2-8 Cost Summary of Monitoring Well Plugging

Activity	A	B	Cost Estimate
	Cost Per well	No. of Mon Wells	Total = A*B
Plug Monitoring Wells			
In Zone Well (MS IZ 1)	\$165,000	1	\$165,000
ACZ Wells (MS USDW 1 and MS USDW 2)	\$33,264	2	\$66,528
Total Cost Estimate			\$231,528

Note: Detailed estimation provided in Appendix B-V.



Table B.2.2-9 Total Costs of Site Closure

Activity	Cost Estimate
Cost to prepare non-endangerment demonstration (Table B.2.2-7)	\$145,000
Cost to plug monitoring wells (Table B.2.2-8)	\$231,528
Total Cost Estimate	\$376,528



Table B.2.3-1 Cost Estimation of Emergency Response Scenarios at Surface Facilities and Injection and Monitoring Wells

Activity	Cost Estimate
Injection or Monitoring Well Integrity Failure	
Tubing and/or Casing Failure	\$400,000
Packer Failure	\$375,000
Zonal Isolation - squeeze	\$400,000
Surface Casing Vent Flow – squeeze	\$325,000
Multiple Barrier Failure Scenerio occurs on 1 well	\$1,500,000
Injection or Monitoring Well Equipment Failure	
Replace Failed Monitoring Equipment	\$50,000
Replace Failed Monitoring Equipment (2 wells)	\$100,000
Natural Disaster (Damage to Surface Structures)	
Flooding (Tidal Surge)	see below
Hurricane (Wind)	see below
Lightning	see below
Damage to Structures	\$200,000
Damage to Roads	\$1,500,000
Cost of Road and surface facility remediation (2 wells, one well pad)	\$1,700,000
Induced or Natural Seismic Event	
Contractor/Labor	\$17,800
Equipment	\$5,500
Mobilization	-
Sample Collection (Formation Testers, U-Tubes, containers, etc)	-
Analysis (on-site/ laboratory)	\$3,155
Mechanical Integrity Testing	\$25,000
Post-Seismic Testing and Monitoring	\$51,455
Total Cost Estimate	\$3,351,455

Note: Estimation by Numeric Solutions.


Table B.2.3-2 Cost Estimation of USDW Endangerment Remediation

Activity	A Fixed	B Variable	Costs (fixed, variable)	Cost Estimate Total = A+B
In the event of a small slow release impacting the ground water wells within the AOR				
Water Replacement (30 days)	\$5,000	\$984	Water tank, water and trucking costs	\$5,984
Water Filtration (at wellhead)	\$16,000	\$45,500	Reverse osmosis system (+ delivery), brine disposal and power	\$61,500
In the event of a release at the well head allowing CO₂ to leak into the water table				
Water replacement & filtration (see above)	\$21,000	\$46,484	see above	\$67,484
Remediation Construction	\$150,000	\$708,800	Road construction, pad and well construction	\$858,800
Testing, Monitoring, and Modeling	\$1,000,000	\$530,000	Technical study, testing & monitoring	\$1,530,000
Remediation (variable potential strategies to remediate surface and ground water)	\$500,000	\$500,000	Capital, operations and maintenance	\$1,000,000
Total Cost Estimate				\$3,456,284

Note: Estimation by Numeric Solutions.


Table B.2.3-3 Total Coverage for Emergency and Remedial Response Insurance

Activity	Cost Estimate
Injection or Monitoring Well Integrity Failure	\$1,500,000
Injection or Monitoring Well Equipment Failure	\$100,000
Natural Disaster (Damage to Surface Structures)	\$1,700,000
Induced or Natural Seismic Event	\$51,455
Brine or CO ₂ Leakage to USDW or Surface	\$3,456,284
Total Cost Estimate	\$6,807,739

APPENDIX B-I

Financial Instrument Letter of Coverage

APPENDIX B-II

Insurance Letter of Coverage

APPENDIX B-III

Cost Estimations for Injection Well Plugging



Cost Estimate: Pre-Plugging Flush

Est'd Rig day	10 hours
Average Well Depth	11,090 feet

Operation	Hours	Days
Start	0	0
MIRU high pressure pump	4	0
MIRU tanks/lines - fill with CaCl ₂ kill/flush fluid	4	0.44
Test pump and lines to 5000psi	2	0.68
P-test annulus - ensure MIT	2	0.9
Kill well down tubing	6	2
Ensure well is dead - Rig out all equipment	8	2.38
Total Days		2.4

Item	Rate	Units	Total
Pump + tanks + BOP's + ancillary equip. (2.4 days)	\$800	2	\$1,904
Engineering / wellsite supervisor (2.4 days)	\$1,800	2	\$4,284
CaCl ₂ Brine (1,000 bbls)	\$47	1000	\$47,000
Misc Trucking/Vac Truck (\$/hr) (60 hours, 10 trips)	\$150	60	\$9,000
Sub total (per well)			\$62,188
Total			\$124,376

These costs were estimated by Numeric Solutions

Cost Estimate: Plugging Operations for MS CCS 1				
	Unit	Cost \$	Qty	Cost
Rig mob & demob	\$/Well	\$20,000	1	\$20,000
Daily workover rig rate	\$/Day	\$4,150	29	\$121,595
Rig mob (skidding)	\$/Well	\$7,000	0	\$0
Pump + tanks + BOP's + ancillary equip.	\$/day	\$1,900	29	\$55,670
4" or 4 1/2" workstring rental	\$/day	\$2,200	29	\$64,460
Handling equipment (lay down machine)	\$/day	\$1,800	10	\$18,000
Fuel	\$/day	\$600	29	\$17,580
Logging	\$/Run	\$25,000	1	\$25,000
Downhole Equipment (retainers + CIBP + 4 scraper runs) + bit + 4 rep days	\$	\$18,885	1	\$18,885
9 5/8" Casing scraper (included above)	\$/Day	\$0	0	\$0
9 5/8" Cement retainers & service (included above)	\$/Unit	\$0	0	\$0
Wireline 9 5/8" CIBP & service	\$/Run	\$5,000	1	\$5,000
Slickline - guage ring / tags	\$/Run	\$2,000	2	\$4,000
CO ₂ resistant cement (PermaSet)	\$/Bls	\$660	290	\$191,400
Class H cement ~ 14ppg	\$/Bls	\$325	277	\$90,025
Cement service & equipment/freight (14 days on-site)	\$/Service	\$17,500	14	\$245,000
Drilling water	\$/gal	\$0	0	\$0
Water and fluid disposal & vacuum truck service	\$/hr	\$150	176	\$26,370
X-Mas tree & wellhead service	\$/Service	\$25,200	0	\$0
Inspection/misc (BOP/workstring/welder)	\$	\$33,275	1	\$33,275
Engineering / wellsite supervisor	\$/Day	\$1,800	32	\$58,140
Contingency - 15%				\$149,160
Total				\$1,143,560

These costs were estimated by Numeric Solutions



Cost Estimate: Plugging Operations for MS CCS 2

	Unit	Rate/Amount	Qty	Cost
Rig mob & demob	\$/Well	\$20,000	1	\$20,000
Daily workover rig rate	\$/Day	\$4,150	31	\$126,617
Rig mob (skidding)	\$/Well	\$7,000	0	\$0
Pump + tanks + BOP's + ancillary equip.	\$/day	\$1,900	31	\$57,969
4" or 4 1/2" workstring rental	\$/day	\$2,420	31	\$73,834
Handling equipment (lay down machine)	\$/day	\$1,800	10	\$18,000
Fuel	\$/day	\$600	31	\$18,306
Logging	\$/Run	\$25,000	1	\$25,000
Downhole Equipment (retainers + CIBP + 4 scraper runs) + bit + 4 rep days	\$	\$18,885	1	\$18,885
9 5/8" Casing scraper (included above)	\$/Day	\$0	0	\$0
9 5/8" Cement retainers & service (included above)	\$/Unit	\$0	0	\$0
Wireline 9 5/8" CIBP & service	\$/Run	\$5,000	1	\$5,000
Slickline - guage ring / tags	\$/Run	\$2,000	2	\$4,000
CO2 resistant cement (PermaSet)	\$/Bls	\$660	298	\$196,680
Class H cement ~ 14ppg	\$/Bls	\$325	277	\$90,025
Cement service & equipment/freight (14 days on-site)	\$/Service	\$17,500	14	\$245,000
Drilling water	\$/gal	\$0	0	\$0
Water and fluid disposal & vacuum truck service	\$/hr	\$150	183	\$27,459
X-Mas tree & wellhead service	\$/Service	\$25,200	0	\$0
Inspection/misc (BOP/workstring/welder)	\$	\$33,275	1	\$33,275
Engineering / wellsite supervisor	\$/Day	\$1,800	34	\$60,318
Contingency - 15%				\$153,055
Total				\$1,173,423

These costs were estimated by Numeric Solutions

APPENDIX B-IV

Cost Estimations of Seismic Monitoring



Cost Estimation: 2D Siesmic Lines (Star Pattern)				
Category	Drilling Costs	Downhole Costs	Dynamite Source Acquistion Costs	Total Costs
Sources	\$1,874,500	\$391,200	\$73,350	\$2,339,050
Receivers				\$1,150,000
Total (per seismic shoot)				\$3,489,050

Cost estimate by non-Numeric third party vendor, costs exclude reciever deployment

APPENDIX B-V

Cost Estimations for Monitoring Well Plugging

Cost Estimation: Plugging of USDW Wells
Cement Plugs Information (USDW Monitor Wells)

Parameter	Plug #1
Casing ID where the plug will be placed (in)	4.5
Sacks of cement to be used	185
Slurry volume (ft ³)	217.5
Slurry weight (lb/gal)	15.6
Top of plug (ft)	Surface
Bottom of plug (ft)	1,970
Type of cement	Class A (or equivalent)
Emplacement method	Pump-down

Cameron Parish Monitor Wells Closure Cost Estimate

In 2024 dollars, the closure plan and plugging procedure is expected to cost approximately \$29,106 for each proposed USDW monitor well. The cost breakdown is shown as follows:

Cameron/Calcasieu Parish USDW Monitor Well Closure Cost Estimate

Item	Estimated Cost
Upfront Engineering Cost	\$2,000
Fluids, Pumping, Vacuum Trucks, and Hauling	\$1,500
Cementing and Abandonment	\$14,800
Restore Location	\$5,000
Supervision	\$3,000
Closure Report	\$2,500
Misc.	\$1,440
Contingency (10%)	\$3,024
Sub-Total - Cost per Well	\$33,264
Total	\$66,528

The closure costs assume that all closure activities will be conducted by a third party with no operable on-site equipment.

Cost estimate by non-Numeric third party vendor

Cost Estimate: Plugging Operations for MS IZ 1

COST ESTIMATION TYPE - P&A

PREP'D BY - Non-numeric 3rd party Vendor

DATE PREP'D - 14-Aug-24

DAYS - 3

Job Purpose: P&A well after utilizing as in-zone monitor well

Item	Details	Rate/Amount	Unit	Cost
Technical Supervision	Engineering/Geological	\$1,000	3	3,000
Site Supervision	Consulting Services	\$1,500	3	4,500
Materials & Supplies	Miscellaneous items			0
Cementing & Services	Internal/External Barrier w/gas migration additive	\$50,000	1	50,000
Chemicals & Solvents	KCL / Packer fluid for monitor			0
Waste Disposal Expense	Dispose well fluids	\$2,000	3	6,000
Electric Wireline Services				0
Fishing Tools & Services	Bit& scraper, Pwr Swivel, w-pipe, mills			0
Packer Equip / Services	Retainer, sqz, tech, etc			0
Hauling & Transportation	Mob/Demob rig; tubular delivery			10,000
SS-Inspection Services	Test Tubing / BOP's			0
Mud & Water				0
Pump Truck Services	Haul Water	\$2,000	3	6,000
Rentals - Other	Workstring/trash trailer/sanitation			5,000
Location & ROW	Restore location	\$25,000	1	25,000
Roustabout Services	Forklift, roustabout services	\$2,500	3	7,500
Wireline & Slickline Services	Tag cmt; pull fiber	\$5,000	3	15,000
Welder	Cut off wellhead			3,000
Well Service Rig	Days	\$5,000	3	15,000
Contingencies				15,000
Total Well Cost Estimate				\$165,000