EMERGENCY AND REMEDIAL RESPONSE PLAN (ERRP)
40 CFR §146.94(a)

Bluebonnet Sequestration Hub

1.0 Facility Information

Facility name: Bluebonnet Sequestration Hub (Bluebonnet Hub or the Project)
Bluebonnet CCS 1, Bluebonnet CCS 2, and Bluebonnet CCS 3 Wells

Facility contacts: Claimed as PBI

Well location: Claimed as PBI

Claimed as PBI

Pursuant to 40 CFR §146.82(a)(19) and 40 CFR §146.94, this Emergency and Remedial Response Plan (ERRP) describes the actions that Bluebonnet Sequestration Hub, LLC, shall take to address movement of the injection or formation fluid in a manner that may endanger an Underground Source of Drinking Water (USDW) during the construction, operation, or post-injection site care periods of the Bluebonnet Sequestration Hub (the Project).

If the Bluebonnet Sequestration Hub, LLC obtains evidence that the injected CO_2 stream and/or associated pressure front may endanger the USDW, the project must perform the following actions as required in 40 CFR §146.94(b):

1. Initiate shutdown plan for the injection well.
2. Take all steps reasonably necessary to identify and characterize any release.
3. Notify the permitting agency Underground Injection Control (UIC) Program Director of the emergency event within 24 hours.
4. Implement applicable portions of the approved ERRP.

Where the phrase "initiate shutdown plan" is used, the Bluebonnet Sequestration Hub, LLC will immediately cease injection as quickly, technically, and safely possible. However, in some circumstances, Bluebonnet Sequestration Hub, LLC, in consultation with the UIC Program Director, will determine whether gradual cessation of injection is appropriate.

If the project demonstrates that the injection operation will not endanger USDWs, the UIC Director may allow the Bluebonnet Hub to resume injection prior to remediation 40 CFR §146.94(c).

2.0 Local Resources and Infrastructure

Resources in the vicinity of the Bluebonnet Sequestration Hub that may be affected due to an emergency event at the project site include groundwater (USDWs), surface riverine, freshwater ponds, lakes, estuarine, freshwater emergent wetlands, and palustrine farmed wetlands.

USDWs in the Gulf Coast includes the Chicot, Evangeline, and Jasper aquifers. In the Bluebonnet Hub site, the USDW has been identified within the Chicot aquifer, which is the main source of drinking water in the area. Site-specific base USDW (< 10,000 mg/l TDS) in the Bluebonnet Sequestration Hub proposed Claimed as PBI

The physical geography of the AoR has the open water of the Rush Ditch, Spindletop Bayou, other unnamed ditches/riverine, and seasonally flooded rice or crawfish farming operations.

Figure ERR-1 shows the surface water features within the project AoR. The surface water features include palustrine, farmed wetlands and riverine with limited freshwater ponds. The “Area of Review and Corrective Action Plan” document included in this permit application provides further details on the USDWs within the project area.

Figure ERR-1: Map of surface water features relatives to the proposed AoR.

Infrastructure in the vicinity of the Bluebonnet Hub that that may be affected due to an emergency at the project site includes domestic residences, water wells, local farming operations, Claimed as PBI

Claimed as PBI

Figure ERR-2: Location of the Infrastructure relative to the proposed AoR.

3.0 Potential Risk Scenarios

The events related to the Bluebonnet Sequestration Hub operations that could potentially result in an emergency response have been identified in a risk assessment workshop and are included in Table ERR-1. This table lists the types of potential adverse incidents that could trigger response actions to protect USDWs and when they might occur (i.e., during the construction, injection, or

post-injection site care periods). In addition, the risk assessment workshop identified the emergency or remedial actions that the Bluebonnet Sequestration Hub, LLC will undertake in response to these incidents. The worst-case consequences of various scenarios have been developed to ensure that response plans are in place for all eventualities.

Table ERR-1: Potential adverse incidents.

Construction/Pre-Injection Period
• Well control event during drilling, completion, or workovers with loss of containment. • Contamination of the USDW with formation brine or drilling fluids during drilling operations.
Injection Period
• Loss of mechanical well integrity injection wells due to tubing or packer leak. • Loss of mechanical well integrity monitoring, water production, and water disposal wells due to tubing or packer leak. • Loss of mechanical well integrity injection wells due to casing leak. • Loss of mechanical well integrity monitoring, water production, and water disposal wells due to casing leak. • Well monitoring equipment failure or malfunction. • Loss of mechanical integrity in the pipeline. • Vertical migration of CO_2 and brines due to loss of external mechanical integrity in CO_2 injection wells. • Vertical migration of CO_2 and brines due to loss of external mechanical integrity in monitoring, water production, and water disposal wells. • Migration of CO_2 from the injection zone through documented legacy wells or undocumented artificial penetrations within the defined AoR. • Migration of CO_2 from the injection zone through faults and fractures or failure of the confining zone. • Rapid and/or unexpected movement of CO_2 outside the defined AoR. • External impact to the surface infrastructure (pipeline and wells). • Induced seismic event. • A natural disaster.
Post-Injection Site Care Period
• Loss of mechanical well integrity in monitoring wells due to tubing or packer leak. • Loss of mechanical well integrity in monitoring wells due to casing leak. • Monitoring equipment failure or malfunction. • Vertical migration of CO_2 and brines due to loss of external mechanical integrity in monitoring wells. • Migration of CO_2 from the injection zone through documented legacy wells or undocumented artificial penetrations within the defined AoR.

- Migration of CO_2 from the injection zone through faults and fractures or failure of the confining zone.
- Rapid and/or unexpected movement of CO_2 outside the defined AoR.
- External impact to the surface infrastructure (pipeline and wells).
- Induced seismic event.
- A natural disaster.

Response actions will depend on the severity of the event(s) triggering an emergency response. “Emergency events” are categorized as shown in Table ERR-2.

Table ERR-2: Degrees of risk for emergency events.

Emergency Condition	Definition
Major emergency	Known release or indication of a potential incident that poses an immediate (acute) risk to human health, resources, or infrastructure. Response actions involving local authorities (evacuation, isolation of areas, or restrictions on water usage) should be initiated.
Serious emergency	Incidents/releases posing potential (chronic) risk to human health, resources, or infrastructure, if conditions worsen or no mitigative or remedial actions are taken.
Minor emergency	Incident poses a challenge to the confinement barrier, but it does not result in the immediate release of CO_2 or brine posing a risk to human health, resources, or infrastructure.

4.0 Emergency Identification and Response Actions

Steps to identify and characterize the event will be dependent on the specific issue identified, controls and mitigations in place, and severity of the event. The avoidance measures and potential actions set forth below are for information purposes. In an emergency, response actions will be based on operational, technical, and safety conditions at the time of the emergency. Additionally, avoidance measures may change over time based on technical and operational advancement. Depending on the severity of the event, the Bluebonnet Sequestration Hub, LLC will activate its corporate emergency response organization as appropriate. The potential risk scenarios listed in Table ERR-1 are detailed below.

4.1 Well Control Event During Drilling, Completion, or Workovers with Loss of Containment

A well control event could occur during drilling, completions, and workover operations if the hydrostatic column controlling the well decreases below the formation pressure, allowing fluids to enter the well. A well control event could also occur due to encountering unexpected overpressure zones while drilling.

Severity: Minor

Timing of event: Construction/Pre-Injection/Injection

Avoidance measures: Blowout prevention (BOP) equipment, BOP testing protocol, kill fluid, well control training, kick drill, lubricators for wireline operations, and legacy well analysis.

Detection methods: flow sensor, pressure sensor, tank level indicator, tripping displacement practices, and mud weight control.

Potential response actions:

- During drilling:
  - Stop operations.
  - Close the BOP.
  - Clear the floor and secure the area.
  - Execute the well control procedure.

  - Evaluate drilling parameters and identify root cause.
  - Continue operations.

- During completion/workovers:
  - Stop operations.
  - Close the BOP.
  - Clear the floor and secure the area.
  - Execute the well control procedure.
  - Continue operations.

Response personnel: Rig crew, rig manager, field superintendent, and project manager

4.2 Contamination of the USDW with Formation Brine or Drilling Fluids During Drilling Operations

Movement of brine between formations during drilling operations could occur if there is a cross flow with losses to the USDW. Contamination with drilling mud could occur during lost circulation events if the formation is not able to support the column of fluids, during a packoff event, or due to swab surge events.

Severity: Minor

Timing of event: Construction/Pre-Injection

Avoidance measures: USDW covered with surface casing, surface section drilled with fresh water and gel, casing test after cementing surface casing to check integrity, and formation integrity test (FIT) test to verify shoe integrity.

Detection methods: tank level sensor, mud lab test, pressure sensors, flow tensors, and tripping sheets.

Potential response actions:

- Stop drilling.
- Check the well level to detect lost circulation or influx.
- In case of loss, treat the well with lost circulation material and evaluate mud weight and drilling parameters.
- In case of influx, control the well without compromising shoe integrity.
- In case the shoe is identified as leaking, squeeze to regain integrity.
- In case the surface casing is identified as leaking, squeeze or casing patch are options.

Response personnel: Rig crew, rig manager, and field superintendent.

4.3 Loss of Mechanical Integrity in CO_2 Injector due to Tubing or Packer Leak

Loss of mechanical integrity due to a tubing or packer leak in the CO_2 injector wells could occur due to corrosion, damage in the tubulars during installation, fatigue, or higher load profiles. This loss could cause communication of the formation fluids with the annulus between the casing and tubing and sustained casing pressure. There is no loss of containment in this scenario.

Severity: Minor

Timing of event: Injection

Avoidance measures: Coated tubing, inhibited packer fluid in annulus, corrosion monitoring plan, dry CO_2 injected, nickel-plated packers, HH trim on tubing hanger for CO_2 injector wellheads and tree, and CR or Inconel carrier for the sensors.

Detection methods: real-time pressure and temperature gauges at the surface and downhole, casing inspection log, annular pressure test, distributed temperature sensing (DTS) fiber optic capabilities, and CO_2 leak sensor on the wellhead.

Potential response actions:

- Follow protocol to close the well, stop operations, vent, or divert CO_2.
- Troubleshoot the well.
- If a tubing leak is detected, discuss an action plan with the regulating authority.
- Schedule well service to repair the well.

Response personnel: Operations engineer, field superintendent, project manager, and rig crew

4.4 Loss of Mechanical Integrity in Monitoring Wells, Water Production Wells, and Water Disposal Wells Due to Tubing or Packer Leak

Loss of mechanical integrity due to a tubing or packer leak in the monitoring, water production, and water disposal wells could occur due to corrosion, damage in the tubulars during installation, fatigue, or higher load profiles. This loss could cause communication of the formation fluids with the annulus between the casing and tubing and sustained casing pressure. There is no loss of containment in this scenario.

Severity: Minor

Timing of event: Injection/Post Injection

Avoidance measures: Inhibited packer fluid in annulus, corrosion monitoring plan, nickel-plated packers, and CR or Inconel carrier for the sensors.

Detection methods: real-time pressure and temperature gauges at the surface and downhole, casing inspection log, annular pressure test, CO_2 leak sensor on the wellhead, DTS fiber installed alongside casing, pulse-activated neutron log, and electromagnetic inspection log.

Potential response actions:

- Troubleshoot the well.
- If a tubing leak is detected, discuss an action plan with the regulating authority.
- Schedule well service to repair the well.

Response personnel: Operations engineer, field superintendent, project manager, and rig crew.

4.5 Loss of Mechanical Integrity in CO_2 Injection Wells Due to Casing Leak

Loss of mechanical integrity due to a casing leak in the CO_2 injection wells could occur due to corrosion, damage in the tubulars during installation, fatigue, or higher load profiles. This loss could cause a migration of CO_2 and brines through the casing, the cement sheet, and into a different formation in the injection target or USDW.

Severity: Minor

Timing of event: Injection

Avoidance measures: CO_2-resistant cement and metallurgy across injection zone, injection through tubing and packer, nickel-plated packers, CR or Inconel carrier sensors, inhibited packer fluid in the annulus, cement to surface, corrosion monitoring plan, Cement Bond Log (CBL) or Ultrasonic Image Tool (USIT) after installation, robust mechanical integrity plan, and USDW cover with surface casing cemented to surface.

Detection methods: real-time pressure and temperature gauges at the surface and downhole, casing inspection log, CO_2 leak sensor on the wellhead, real-time DTS fiber alongside of casing, flow rate monitoring, soil gas probes, neutron-activated logs, and USDW water monitoring.

Potential response actions:

- Follow protocol to stop operations, vent, or divert CO_2.
- Troubleshoot the well.
- Evaluate if there is movement of CO_2 or brines to the USDW.
- If the USDW is affected, discuss remediation with the regulating authority.
- If a casing leak is detected, discuss an action plan with the regulating authority.
- Schedule well service to repair the well.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, and remediation contractors

4.6 Loss of Mechanical Integrity Monitoring Wells, Water Production Wells, and Water Disposal Wells Due to Casing Leak

Loss of mechanical integrity due to a casing leak in the monitoring, water production, and disposal wells could occur due to corrosion, damage in the tubulars during installation, fatigue, or higher load profiles. This loss could cause a migration of CO_2 and brines through the casing, the cement sheet, and into a different formation in the injection target or USDW.

Severity: Minor

Timing of event: Injection/Post Injection

Avoidance measures: CO_2-resistant cement across injection zone, nickel-plated packers, CR or Inconel carrier sensors, inhibited packer fluid in the annulus, cement to surface, corrosion monitoring plan, CBL/USIT after installation, and USDW cover with surface casing cemented to surface.

Detection methods: real-time pressure and temperature gauges at the surface and downhole, casing inspection log, annular pressure test, DST capabilities, CO_2 leak sensor on the wellhead, soil gas probes, neutron-activated logs, and USDW water monitoring.

Potential response actions:

- Troubleshoot the well.
- Evaluate if there is movement of CO_2 or brines to the USDW.
- If the USDW is affected, discuss remediation with the regulating authority.
- If a casing leak is detected, discuss an action plan with the regulating authority.
- Schedule well service to repair the well.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, and remediation contractors

4.7 Well Monitoring Equipment Failure or Malfunction During Injection

A failure of the monitoring system or associated alarm devices may cause over pressurization of the system or reservoir beyond the design limits, which could cause reservoir fracture, leaks or failure of equipment and tubulars, and facilities damage.

Severity: Minor

Timing of event: Injection

Avoidance measures: Preventative maintenance program and periodic inspections

Detection methods: Real-time monitoring systems, redundancy, and field inspections.

Potential response actions:

- If a single surface-monitoring device (e.g., surface pressure transmitter) that has a redundant device (i.e., second pressure transmitter) still in operation fails, the operational response required is to repair the device. No change to operations will be immediately planned.
- If a downhole monitoring equipment fails, the project manager will assess the impact and prepare an action plan to be discussed with the UIC Director.

4.8 Vertical Migration of CO_2 and Brines Due to Loss of External Mechanical Integrity in CO_2 Injection Wells

During the life of the injector wells, there are induced stresses and chemical reactions on the cement exposed to the CO_2 pressure and plume. These mechanics could lead to cracks, channels, or permeable paths inside the cement that could connect the injection zone with those above the storage complex, causing migration of brines or CO_2 potentially affecting the USDW.

Severity: Minor

Timing of event: Injection

Avoidance measures: CO_2-resistant cement and metallurgy across the injection zone, injection through tubing and packer, cement to surface, CBL/USIT after installation, and USDW covered as a section barrier with surface casing and surface cement sheet.

The injection zone in the Catahoula Aquifer (Frio) is on average [redacted] below the base of the USDW. The described base of Hackberry, intraformational Frio, primary Anahuac, and secondary Lower Miocene Confining Zones as well as the additional composite confining zones (five confining zones altogether) are in place to protect any fluid migration outside the permitted Hackberry and Frio Injection Zones to protect the USDW.

The injector wells will be plugged and abandoned at the end of the injection period in accordance with the Injection Well Plugging Plan included with this permit application.

Detection methods: CO_2 leak sensors on the wellhead, real-time DTS fiber alongside the casing, soil gas probes, USDW water monitoring, neutron-activated logs to be run for external MI, pressure gauges at the surface, and flow rate monitoring.

Potential response actions:

- Follow protocol to stop operations, vent, or deviate CO_2.
- Troubleshoot the well.
- Evaluate if there is any movement of CO_2 or brine to the USDW.
- Discuss remediation options, action plan, and monitoring plan with the regulating authority, if necessary.
- Discuss plan to repair the well with the regulating authority.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, and remediation contractors

4.9 Vertical Migration of CO_2 and Brines Due to Loss of External Mechanical Integrity in Monitoring Wells, Water Production Wells, and Water Disposal Wells Due to Casing Leak

During the life of the monitoring wells, water production wells, and water disposal wells, there are induced stresses and chemical reactions on the cement exposed to brines, the pressure plume, and CO_2. These mechanics could lead to cracks, cement deterioration, and/or channels or permeable paths inside the cement that could connect the injection zone with those above the storage complex, causing migration of brines or CO_2.

Severity: Minor

Timing of event: Injection and Post-Injection

Avoidance measures: CO_2-resistant cement across the injection zone, cement to surface, CBL/USIT after installation, and USDW is covered the surface casing and surface cement sheet as primary barrier. The water disposal wells and the above-confining-zone/USWD wells do not penetrate the CO_2 injection target.

Detection methods: CO_2 leak sensors on the wellhead, soil gas probes, USDW water monitoring, neutron-activated logs to be run for external MI, and pressure gauges at the surface. DST fiber installed alongside the casing in water production wells and in-zone monitoring wells.

Potential response actions:

- Troubleshoot the well.
- Evaluate if there is any movement of CO_2 or brine to the USDW.
- Discuss remediation options, action plan, and monitoring plan with the regulating authority, if necessary.
- Discuss plan to repair the well with the regulating authority.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, and remediation contractors

4.10 Migration of CO_2 From the Injection Zone through Documented Legacy Wells or Undocumented Artificial Penetrations within the Defined AoR

This event occurs if formation brines and CO_2 migrate through poor cement bonding, cement degradation, open hole abandonments, or cracking in the cement in existing legacy wells.

Severity: Serious

Timing of event: Injection and Post-Injection

Avoidance measures: Fifteen legacy wells were identified in the proposed AoR. The wells are or will be properly abandoned based on the leak assessment evaluation. CO_2 resistant cement will be utilized on wells that require a P&A program. An Airborne Magnetic Survey will be conducted over the AoR before injection to identify potential undocumented wells.

Detection methods: Soil Gas Probes across AoR, real time pressure and temperature indication on monitoring wells, 2D surface seismic surveying, 3D VSP (vertical seismic profile) surveys, time lapsed pulse neutron electromagnetic log, ground water monitoring, and in-zone monitoring dedicated to measuring reservoir pressure to calibrate the model.

Potential response actions:

- Evaluate if there is any movement of CO_2 or brine to the USDW due to a leak in a legacy or P&A the well.
- Discuss remediation options, action plan, and monitoring plan with the regulating authority, if necessary
- Discuss plan to repair the well with the regulating authority.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, and remediation contractors

4.11 Migration of CO_2 from the Injection Zone Through Faults and Fractures or Failure of the Confining Zone

Migration of brine or CO_2 during injection could occur if the pressure of the injection zone exceeds the sealing capacity of the caprock or seal above or if fault or fracture features are reactivated. Brine or CO_2 could migrate to a shallower formation, including the USDW.

Severity: Minor

Timing of event: Injection/Post Injection

Avoidance measures: Seismic survey in the area shows no faults crossing the storage formation or the seal, injection is limited to 76% of the fracture gradient, and extensive characterization of the geology shows good sealing capacity. The injection zone in the Catahoula aquifer (Frio) is on average Claimed as PBI below the base of the USDW. The described base of the Hackberry, intraformational Frio, and primary Anahuac and secondary Lower Miocene Confining Zones as well as the additional composite confining zones (five confining zones altogether) are in place to protect any fluid migration outside the permitted Hackberry and Frio Injection Zones to protect the USDW.

Detection methods: Above-confining-zone/USDW water sampling and pressure monitoring, 2D surface seismic, 3D VSP surveys, neutron-activated logs in monitoring wells, and soil gas monitoring. And reservoir pressure and temperature real-time monitoring with in-zone monitoring wells.

Potential response actions:

- Follow protocol to stop injection.
- Assess root cause by reviewing monitoring data.
- If required, conduct geophysical survey to delineate potential leak path.
- Evaluate if there is any movement of CO_2 or brine to the USDW due to a failure of confining rock, faults, or fractures.
- Discuss remediation options, action plan, and monitoring plan with the regulating authority, if necessary
- Actions to restore injection depend on the nature of the leak path and extension.

Response personnel: Monitoring staff, geologist, reservoir engineer, project manager, and remediation contractors

4.12 Rapid and/or Unexpected Movement of CO_2 Outside the Defined AoR

Lateral migration of CO_2 outside the defined AoR could occur during injection or post-injection if the plume moves faster or in an unexpected pattern and expands beyond the secure pore space and AoR for the Project.

Severity: Serious

Timing of event: Injection/Post-Injection

Avoidance measures: Detailed geologic model with the stratigraphic well as a calibration, seismic survey integrated in the model, extensive characterization of the rocks and formation, AoR review and calibration at least every 5 years, and monitoring of the plume until stabilization.

Detection methods: 2D surface seismic, 3D VSP surveys, neutron-activated logs in monitoring wells, and soil gas monitoring. Reservoir pressure and temperature monitored with In Zone monitoring wells real time.

Potential response actions:

- Injection
  - Review monitoring data and trends compared with simulation.
  - Discuss findings with the regulating authority and request to maintain injection during AoR evaluation if data shows no endangerment of USDWs.
  - Perform logging in monitoring wells.
  - Conduct geophysical survey as required to evaluate AoR.
  - Recalibrate model and simulate new AoR.
  - Assess if additional corrective actions and additional pore space are needed.
  - Assess if remediation is needed; prepare an action plan and review with the regulating authority.
  - Present AoR review to regulating authority for approval and adjust monitoring plan.
- Post-Injection
  - Review monitoring data and trends compared with simulation.
  - Discuss findings with the regulating authority.
  - Conduct geophysical survey as required to evaluate AoR.
  - Recalibrate model and simulate new AoR.
  - Assess if additional corrective actions and pore space are needed.

Response personnel: Monitoring staff, geologist, reservoir engineer, and project manager

4.13 External Impact to the Infrastructure (Pipeline, Wells)

Surface impact may cause loss of containment during the follow scenarios:

- External impact to the wellhead of the CO_2 Injection wells.
- External impact to the wellhead of the monitoring wells, water production wells, and water disposal wells.
- External impact to the surface piping or buried pipelines

4.13.1 Loss of Containment; External Impact to the Wellhead of the CO_2 Injection Wells

This event could occur if the wellhead is hit by a massive object (such as a vehicle or other heavy equipment) while in operation. In this scenario, the object causes major damage to the equipment that results in the well separating from the pipeline and shut-off system and leads to a loss of containment of CO_2 and brine.

Severity: Major

Timing of event: Injection

Avoidance measures: Fenced location and bollards installed and signage. A dispersion analysis was performed for this potential release event and did not identify any major public impact. This event is very unlikely to happen.

Detection methods: Real-time pressure and temperature at the wellhead and surface facilities, field inspections, and OGI (Optical Gas Imaging) cameras.

Potential response actions:

- Automated shutdown will initiate; follow protocol to shutdown CO_2 delivery if the automated shutdown devices are not functional.
- If there is injured personnel or property damage, contact the field superintendent to activate emergency evacuation and secure location.
- Clear the location and secure the perimeter.
- Contact the well control special team to execute blowout emergency plan that may include capping the well, drilling a relief well to kill injector, repair the well, and/or abandon the well; discuss plan with the regulating authority.
- Evaluate environmental impact on soil, water, and vegetation; present remediation plan to regulating authority.
- Execute remediation and install monitoring system, as needed.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, remediation contractors, and well control specialist

4.13.2 Loss of Containment; External Impact to the Wellhead of The Monitoring Wells, Water Production Wells and Water Disposal Wells

This event would occur if the wellhead of the deep monitoring well or water production well is hit by a massive object and causes major damage leading to a loss of containment. Since the well is open to the formation pressure at the CO_2 injection zone, formation fluids have the potential to flow and spill on the location and around the area.

Severity: Serious

Timing of event: Injection and Post-Injection

Avoidance measures: Fenced location and bollards installed, signage, and reduced pressure in the monitoring well compared with the injection well.

Detection methods: Field inspections and real-time pressure and temperature at the wellhead and surface facilities.

Potential response actions:

- If there is injured personnel or property damage, contact the field superintendent to activate emergency evacuation and secure location.
- Clear the location and secure the perimeter.
- Contact the well control special team to execute blowout emergency plan that may include capping the well, drilling a relief well to kill injector, repair the well, and/or abandon the well; discuss plan with the regulating authority.
- Evaluate environmental impact on soil, water, and vegetation; present remediation plan to regulating authority.
- Execute remediation and install monitoring system, as needed.

Response personnel: Operations engineer, field superintendent, project manager, rig crew, remediation contractors, and well control specialist

4.13.3 Loss of Containment; External Impact to the Surface Piping or Buried Pipeline

External impact to the surface piping or buried pipeline due to heavy trucks or equipment could cause loss of containment of brine or CO_2, if the pipe is ruptured.

Severity: Major

Timing of event: Injection

Avoidance measures: Fenced location and bollards installed to protect surface piping, field pipeline buried, pipeline Right-of-Way identified with signage, and One Call 811 Program. A dispersion analysis was performed for this potential release event and did not identify any public impact.

Detection methods: Real-time pressure, temperature, and flow measurements and field inspections.

Potential response actions:

- Automated shutdown will initiate; follow protocol to shutdown CO_2 delivery if the automated shutdown devices are not functional.
- If there are injured personnel or property damage, contact the field superintendent to activate emergency evacuation and secure location.
- Clear the location and secure the perimeter.
- Evaluate environmental impact on soil, water, and vegetation; present remediation plan to regulating authority.
- Execute remediation and install monitoring system as needed.

Response personnel: Operations engineer, field superintendent, project manager, remediation contractors, and well control specialist

4.14 Natural Disaster

Well problems (integrity loss, leakage, or malfunction) may arise from a natural disaster affecting the normal operation of the injection wells. A major seismic event may disturb surface and/or subsurface facilities and weather-related disasters (e.g., tornado, lightning strike, or hurricane) may affect surface facilities. Seismic survey of the AOR shows no faults that could be activated. The region is seismically stable.

If a natural disaster occurs that affects normal operation of an injection well, perform the following:

Severity: Dependent on severity of event; potentially Major

Timing of event: Injection and Post-Injection

Avoidance measures: Shutoff valves are present to shutoff injection into the wells when abnormal operating parameters, particularly high or low pressures, are present in the pipeline delivering CO_2 to the injection site.

Detection methods: A geophone array located on the surface to monitor seismicity will detect naturally occurring major seismic events during the injection period. Pipeline and wellhead real

time monitoring of pressures and flows. Daily surveillance of the site will allow us to forecast natural events and start securing the site ahead of the event.

Potential response actions:

- If there is injured personnel or property damage, contact the field superintendent to activate emergency evacuation and secure location.
- Follow protocol to stop injection in the event the site was not secured previously.
- Assess mechanical integrity of the system; propose repair actions based on findings.
- If assessment allows for resuming injection safely, increase surveillance to validate effectiveness of actions.

Response personnel: Operations engineer, field superintendent, project manager, geologist, reservoir engineer, monitoring staff, remediation contractors, and emergency teams

4.15 Induced Seismic Event

Based on the project operating conditions, it is highly unlikely that injection operations would ever induce a seismic event. Therefore, this portion of the response plan is developed for any seismic event with an epicenter within a 5.6-mile radius of an injection well.

A geophone array located on the surface will be used to monitor the area for seismicity.

Severity: Minor

Timing of event: Injection and Post Injection

Avoidance measures: Seismic survey of the storage complex shows no faults that could be reactivated, detailed geomechanical model created to evaluate the storage complex, and region is seismically stable. Shutoff valves are present to shutoff injection into the well.

Detection methods: Geophone array on surface

Potential response Actions:

- For event above ML 2.0 within 5.6 miles of an injection well
  - Review monitoring parameters to validate normal operation.
  - If parameters indicate a potential mechanical integrity failure, follow procedure for event above ML 4.5
  - Compare storage behavior with the model.
  - If needed, propose adjustments to operating conditions.
- For event above ML 4.5 within 5.6 miles of an injection well
  - If there is injured personnel or property damage, contact the field superintendent to activate emergency evacuation and secure location.
  - Follow protocol to stop injection.
  - Assess mechanical integrity of the system; propose repair actions based on findings.
  - Assess environmental impact; discuss remedial action with the regulating authority, if necessary
  - Review regional information and monitoring records to determine the origin of the event.

- If there is evidence that the event was induced by site activity, reevaluate model, define new injection parameters (as necessary), and discuss with the regulating authority.
- If assessment allows for resuming injection safely, increase surveillance to validate effectiveness of actions.

Response personnel: Operations engineer, field superintendent, project manager, geologist, reservoir engineer, monitoring staff, remediation contractors, and emergency teams

5.0 Response Personnel and Equipment

Site personnel, project personnel, and local authorities will be relied upon to implement the ERRP. Monitoring, control, and routine maintenance of the injection operations will be the responsibility of the Injection Operations Staff. Site personnel must include, at minimum, the positions listed below in Table ERR-3.

If an adverse event is discovered, the Operations Manager and Emergency Coordinator on duty will be notified immediately. The Emergency Coordinator will be responsible for notifying offsite emergency agencies and resources. The Operations Manager or their delegate will contact outside emergency response organizations if the Emergency Coordinator is not available. The EPA (Environmental Protection Agency) Region 6 UIC Program Director will be notified within 24 hours, per 40 CFR §146.91(c) and 40 CFR §146.94(b)(3).

Table ERR-3: Operations staff descriptions.

A site-specific emergency contact list will be developed and maintained during the project's life. The Bluebonnet Sequestration Hub, LLC will provide the current site-specific emergency contact list to the UIC Program Director.

A list of contacts for state agencies having jurisdiction within the AoR and key local emergency agencies is presented below in Table ERR-4.

There are no federally recognized Native American Tribes located within the AoR. If a federally recognized Native American Tribes were to exist in the AoR at the time of a site emergency, then that tribe(s) will be notified of the site emergency at that time.

Table ERR-4: Contact information for key local, state, and other authorities.

Equipment needed in the event of an emergency and remedial response will vary, depending on the triggering emergency event. Response actions (cessation of injection, well shut-in, and evacuation) will generally not require specialized equipment to implement. Where specialized equipment (such as a drilling rig or logging equipment) is required, the Bluebonnet Sequestration Hub, LLC shall be responsible for its procurement.

6.0 Emergency Communications Plan

Bluebonnet Sequestration Hub, LLC will communicate to the public about any event that requires an emergency response. The amount of information, timing, and communications method(s) will be appropriate to the event, its severity, whether there is any risk to human health or the environment or any impacts to drinking water, any impacts to the surrounding community, and current understanding of the event.

As may be required by any government agency with jurisdiction over the project, the Bluebonnet Sequestration Hub, LLC will, to the extent known, communicate with appropriate stakeholders what happened, current or potential impacts to the environment or other local resources, how the event was investigated, what responses were taken, and the status of the response. For responses that occur over the long-term (e.g., ongoing cleanups), the Bluebonnet Sequestration Hub, LLC will provide appropriate periodic updates to the UIC Program Director on the progress of the response action(s).

The Bluebonnet Sequestration Hub, LLC will also communicate with entities who need to be informed about or act in response to the event, including local water system operators, CO_2 source(s), pipeline operators, landowners, and Regional Response Teams (as part of the National Response Team).

If a seismic event occurs, the Bluebonnet Sequestration Hub, LLC will, to the extent it can be reasonably determined, provide information to the UIC Program Director about whether the event was naturally occurring or induced by the injection, whether any damage to the well or other structures in the area occurred, the investigative process, and what responses, if any, were taken by the Bluebonnet Sequestration Hub, LLC or others.

7.0 Emergency and Remedial Response Plan Review

The project team will review the ERRP periodically and will comply with 40 CFR §146.94(d).

The project team will review the ERRP:

- At least once every five (5) years following its approval by the permitting agency.
- Within one (1) year of an area of review (AOR) reevaluation.
- Within a prescribed period (to be determined by the permitting agency) following any significant changes to the injection process or injection facility or an emergency event
- As required by the permitting agency.

If the review indicates that no amendments to the ERRP are necessary, the project team will provide the permitting agency with the documentation supporting the “no amendment necessary” determination.

If the review indicates that amendments to the ERRP are necessary, amendments shall be made and submitted to the permitting agency within six months following an event that initiates the ERRP review procedure.

8.0 Staff Training and Exercise Procedures

All operations employees will receive training related to health and safety, operational procedures, and emergency responses according to the roles and responsibilities of their work assignments. Initial training will be conducted by, or under, the operations manager or a designated representative's supervision. Trainers will be thoroughly familiar with the Operations Plan and ERRP.

Facility personnel will participate in annual training that teaches them to perform their duties in ways that prevent CO_2 discharge. The training will include familiarization with operating procedures and equipment configurations appropriate to the job assignment and emergency response procedures, equipment, and instrumentation. New personnel will be instructed before beginning their work.

Refresher training will be conducted at least annually for all operations personnel. Monthly briefings will be provided to operations personnel according to their respective responsibilities and highlighted with recent operating incidents, actual experience in operating equipment, and recent storage reservoir monitoring information.

Only personnel who have been properly trained will participate in drilling, construction, operations, and equipment repair at the storage site. A record including the person's name, date of training, and instructor's signature will be maintained.