CLASS VI PERMIT EMERGENCY AND REMEDIAL RESPONSE PLAN

40 CFR 146.94(a)

LAPIS ENERGY (AR DEVELOPMENT) LP
PROJECT BLUE
EL DORADO, ARKANSAS

Prepared By:
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1.0 FACILITY INFORMATION

Facility/Project Name:	El Dorado Chemical Company – Lapis Energy Project Blue Class VI Injection Well No. 1
Facility/Project Contact:	Stijn Konings, Chief Geoscientist Lapis Energy LP 2950 N. Harwood St. Dallas, Texas 75201 (972) 757-6529 / skonings@lapisenergy.com
Well Locations:	Union County El Dorado, Arkansas Project Blue Class VI Injection Well No. 1 Latitude Coordinate: 33.26217733 Longitude Coordinate: -92.69162567

This document will define the requirements for the Emergency and Remedial Response Plan (ERRP) for a Class VI well as required by Code of Federal Regulations, Title 40 – Protection of the Environment Section, Part 146 – Underground Injection control program: Criteria and standards, Subpart H – Criteria and Standards Applicable to Class VI Wells, Section 146.94. (40-CFR-146.94)

Note: that this ERRP is to be read in conjunction with the LSB/El Dorado Chemical Company ERRP.

This ERRP describes actions that Lapis Energy shall take to address movement of the injection fluid or formation fluid in a manner that could endanger the underground source of drinking water (USDW) during the construction, operation, or post-injection site care periods.

If Lapis Energy obtains evidence that the injected CO_2 stream and/or associated pressure front may cause an endangerment to the USDW, Lapis Energy will perform the following actions:

1. Initiate shutdown plan for the injection well(s).
2. Take all steps reasonably necessary to identify and characterize the nature of any release.

3. Notify the permitting agency (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 following protocol will be employed: Lapis Energy will immediately cease injection. However, in some circumstances, Lapis Energy will, in consultation with the UIC Program Director, determine whether gradual cessation of injection (using the parameters set forth in the Summary of Requirements of the Class VI permit) is safe and appropriate.

2.0 LOCAL RESOURCES AND INFRASTRUCTURE

The Lapis Energy-El Dorado Facility site is located northwest of the city of El Dorado in Union County, Arkansas. According to the most recent Census data in 2020, Union County had a population of 38,340 people. Union County ranks the 19th largest county by population of the 75 counties in Arkansas. By land area, Union County is the largest county encompassing 1,055 square miles (2,730 km^2), of which 1,039 (2,690 km^2) square miles is land, and 16 square miles (41 km^2) is water. The economy of Union County, Arkansas employs approximately 15.9 thousand people. The largest industries are manufacturing, health care and social assistance, and retail trade.

Resources in the vicinity of the Lapis Energy-El Dorado Facility site that may be affected as a result of an emergency event at the project site include:

- Local USDW impacts from groundwater wells.
- Surficial water bodies:
  - Facility Onsite Lake

These freshwater resources, which have been identified as being located within or proximal to the project site, have been determined to be at least 3,000 feet above the proposed subsurface injection reservoir targets. Although there is little likelihood that facility operations at the project site would negatively impact any of these freshwater resources at any point in time during the lifetime of those operations, the protection of these important resources is still considered of paramount importance and will be discussed throughout this ERRP.

Infrastructure in the vicinity of the Lapis Energy- El Dorado Facility site that that may be affected as a result of an emergency at the project site include:

- Railways – freight train rail lines run by Union Pacific Railroad.
- Roads – main public roads for traffic in the area next to the facility.
  - Arkansas Hwy 7
  - Arkansas Hwy 335
- Plants – production facility.

  - LSB, El Dorado AR facility
  - Continental Carbonic- Dry ice manufacturer

- Major City
  - El Dorado

Resources and infrastructure addressed in this plan are shown in Figures 1 and 2.

3.0 POTENTIAL RISK SCENARIOS

The following sections of this ERRP address events that could potentially result in an emergency response by Lapis Energy. Risks have been identified for incidents that could occur:

- During the construction (drilling and completion) phase of the injection and monitor wells
- During the injection operation phase of the facility
- During the post-closure and site closure operations phase

During each such phase, all on-site personnel will be required to wear the appropriate personal protective equipment (PPE) for any potential hazardous materials and risks associated with that operational phase of the Project Blue Injection Well at the El Dorado Chemical facility.

3.1 CONSTRUCTION PHASE

Risks associated with the drilling and completion of the injection and monitor wells are:

- Potential well control events (see section 4.2)
- Potential migration of fluids between formations (see section 4.1)

Safety programs and training will be in place during the drilling and completion of injection and monitoring wells. A detailed Health, Safety, and Environmental (HSE) plan will be developed, along with selected vendors, to meet Occupational Safety and Health Act (OSHA) standards to safely perform the initial phase of project development. Every operator and contractor will have the right, obligation, authority, and responsibility to stop work or any action that is deemed unsafe or could negatively impact the environment. It should be noted that all subterranean strata that will be drilled into or through by the proposed injection and monitor wells are known to be normally pressured strata (*i.e.*, not abnormally pressured or geopressured).

3.2 INJECTION OPERATION PHASE

Risks associated with the injection operation phase of the project have been identified as follows:

- Mechanical integrity of the injection and monitor wells (see section 4.3)
- Injection well monitoring equipment failure (*e.g.*, shut-off valve or pressure gauge, *etc.*) (see section 4.4)
- Migration of CO_2 (see section 4.5)
    - Potential vertical migration of CO_2 to a USDW (via defective casing or cement bond in an injection or monitor well, or geological defect)
    - Potential lateral migration of CO_2 outside the defined Sequestration Complex and Area of Review (AoR)
- A natural disaster (see section 4.6)
    - Natural disaster (*e.g.*, earthquake, tornado, hurricane, lightning strike) (*very low risk*)
    - Induced seismic event (*very low risk*)
- Topsides Facility Failure (see section 4.7)
    - Over pressurization of topsides facility resulting in catastrophic failure and potential personnel injury

3.3 POST INJECTION SITE CARE AND CLOSURE PHASE

Risks associated with the Post Injection Site Closure (PISC) care, which consists of the monitoring of the CO_2 for a duration period set by the permit parameters have been identified as follows:

- Mechanical integrity of monitor wells
- Monitoring equipment failure
- Potential vertical migration of CO_2 to a USDW (through natural or manmade conduits)
- Potential lateral migration of CO_2 outside defined Sequestration Complex or AoR
- A natural disaster (*e.g.*, earthquake, tornado, hurricane, lightning strike) (*very low risk*)

3.4 DEGREES OF RISK

Response actions will depend on the severity of the event(s) triggering an emergency response. "Emergency events" are categorized as shown in Table 1.

Table 1: Degrees of Risk for Emergency Events

Emergency Condition	Definition
Major emergency	Event poses immediate substantial risk to human health, resources, or infrastructure. Emergency actions involving local authorities (evacuation or isolation of areas) should be initiated immediately.
Serious emergency	Event poses potential serious (or significant) near term risk to human health, resources, or infrastructure if conditions worsen or no response actions are taken.
Minor emergency	Event poses no immediate risk to human health, resources, or infrastructure.

Monitoring and alarm systems will provide notifications of a potential leak of CO_2 or formation fluids out of regulatory zones, from the injection well, monitoring wells, or surface facilities (*i.e.* pipelines, storage systems, *etc*.). Alarms will also be set to monitor injection parameters, mechanical well integrity, and the injection system integrity [40 CFR 146.88 (e)(2)]. If data shows that there is leakage from the reservoir system or a mechanical well failure, the operator will follow the initial steps to assess the emergency risks as defined above. Secondly, the operator/facility will follow the actions identified below:

1. The project will activate the emergency and remediation response protocol consistent with this ERRP and circumstances of the event.

2. The Environmental Protection Agency (EPA) Region 6 Underground Injection Control Program Director (UIC Program Director) will immediately be notified within 24 hours of the event being discovered.

3. The Arkansas Department of Environmental Quality Underground Injection Control Program Director (ADEQ UIC Program Director) will immediately be notified within 24 hours of the event being discovered.

The acting UIC Program Director in authority at the Federal or State level (depending on status of primacy for Class VI programs) may allow the operator to resume injection prior to remediation if the storage operator demonstrates that the injection operation will not endanger the USDW.

4.0 EMERGENCY IDENTIFICATION AND RESPONSE ACTION

Steps to identify and characterize the event will be dependent on the specific issue identified, and the severity of the event. The potential risk scenarios are based upon construction, operation, and closure activities associated with the lifetime of the project. The potential risks are identified in Table 2 and discussed in the following Sections. Impact severity is based upon the definitions in Table 1. Risk likelihood is based upon experience in well drilling, operation, and maintenance in other classes of injection wells.

Table 2: Potential Risks and Detection

Potential Emergency Event	Location	Phase*	Impact Severity	Risk Likelihood	Detection
4.1 Contamination of USDW with Drilling Fluids	Wellbore	C	Minor	Very Unlikely	Loss of circulation while drilling
4.2 Well Control Event	Well	C	Serious to Major	Very Unlikely	Unexpected changes in well fluid levels occur while drilling. Influx of hazardous gases from formations
4.3 Injection Well Integrity Failure	Casing, annulus, tubing, or packer	I	Minor	Unlikely	Loss in annular fluid pressure or tubing pressure; unusual injection rate changes
4.4 Injection Well Monitoring Equipment Failure	Wellhead	I	Minor to Serious	Unlikely	Failure of parameter-monitoring equipment
4.5 Potential Injectate Leakage to a USDW	Well or AoR	I, PI	Minor to Serious	Very Unlikely	Onset of elevated injectate concentrations in monitoring well. Temperature survey vertical profile anomalies.
4.6 Natural Disaster	Well or AoR	I, PI	Minor to Major	Very Unlikely	NA
4.7 Topside Failure	Compression and transport	I	Minor to Serious	Unlikely	Loss of pressure, visual (ice, snow), gas detectors etc.

**Note: C = Construction Period, I = Injection Phase and PI = Post Injection Period*

4.1 CONTAMINATION OF USDW WITH DRILLING FLUIDS

During the construction phase, there is a low risk of potential drilling fluids contaminating a USDW due to crossflow and losses into the formation. Losses will be monitored during all phases of the drilling of the injection and monitoring wells. The surface hole will be drilled using a water-based mud system to protect the formation above, across, and directly beneath the USDW. Best practice drilling methods and procedures will be employed to limit a potential leakage event. Monitoring parameters such as tank levels, flow lines, and flow pressures will lead to a first detection response.

The surface casing will be set into an impermeable layer at depths greater than the lowermost USDW. The surface casing will then be cemented to surface [40 CFR 146.86(b)(2)], and cement integrity will be verified through a cement bond log (CBL) prior to proceeding to the next phase of drilling. This will protect and isolate the USDW's from potential contamination during the deeper drilling operations and during injection operations.

4.1.1 Impact Severity and Risk

The potential risk of a contamination of a USDW because of drilling and construction of the well is considered low. First, the volume of drilling fluid used to drill through the shallow reservoirs that comprise the USDW is relatively small compared to the USDW, and the time required to drill through that interval is very short (typically 24-48 hours). Second, the non-toxic gels and mud additives used to drill the interval likely seal off the wellbore (with a wallcake) shortly after drilling. Finally, there is a long and established history of the successful and safe setting of surface casing in hundreds and thousands of wells – typically oil and gas test wells - nationwide.

If there is a documented (localized) invasion / contamination of the USDW with the non-toxic drilling fluid, the impact would be considered a minor emergency event, as such a release would not constitute an immediate risk to human health, resources, or infrastructure. At the first detection of a potential event, drilling operations will cease and the situation will be evaluated and mitigated. It should be noted, however, that the best mitigation of such an event would be the setting and cementing of the surface casing across the USDW, as originally contemplated. If such a release to the USDW occurs after the surface casing has been set and cemented, the leak will be sealed off in accordance with the following Potential Response Actions.

4.1.2 Potential Response Actions

In the very unlikely event of a release to the USDW during drilling operations conducted after the surface casing has been set and cemented, the following steps will be undertaken:

1. Cease all drilling operations and assess fluid levels in wellbore.
2. Evaluate the drilling parameters, tank levels, and flow lines.
3. Determine amount of potential fluid losses and at what specific depth.
4. Treat mud with lost circulation materials and adjust mud weight to allow for continuation of drilling operation continuation.
5. Check for leaks in casing and at the casing shoe. **IF** detected squeeze/patch identified defect.
6. Verify integrity of cement with additional CBL run(s), if required.

If a leak is detected in the surface casing, it will be squeezed with additional cement or patched, and the post-repair cement integrity will then be re-affirmed prior to resuming drilling operations.

Drilling operations will only resume once the post-repair testing of the surface casing and its cement job confirms its integrity. The casing shoe of the surface casing will also be pressure-tested to verify its integrity prior to proceeding to the next phase of drilling.

4.1.3 Response Personnel and Equipment

During the drilling phase the personnel responsible for monitoring and detection will be the rig crew, who will immediately report any indication of a release to the USDW to the company man. The company man will then immediately cease all drilling operations and stabilize the well. The project supervisor will then be notified and the next steps in the response plan will be initiated. The tank levels and pressure and flow meters will be checked and recalibrated if required.

Refer to Section 5.0 for contact details.

4.2 WELL CONTROL EVENT

During the drilling phase, if a well control event occurs it could potentially lead to the influx and subsequent movement of formation fluid or formation gases from one zone to another. Such a well control event would be caused by the formation pressure of one zone being greater than the hydrostatic pressure of the drilling mud column that would otherwise maintain "overbalanced" mudweight conditions, leading to the sudden influx of fluids and/or gases (*i.e.*, a well "kick"). The inverse can also take place, where the overbalance of the mud is too great, and the well will incur mud losses whilst drilling.

4.2.1 Impact Severity and Risk

The severity of this type of event is relatively low if the cause of the event is immediately and properly addressed. However, if not immediately mitigated a well control event can become a highly severe and dangerous problem if it leads to a loss of control and presents an impact to human health and infrastructure. The risk of this type of severe event ever occurring at the Lapis Energy- El Dorado Facility site is considered very low and highly unlikely. Multiple oil and gas test wells of varying depths have been drilled within a four-mile radius of the project site without one single severe loss of control event having been recorded. The drilling records and other records filed with the State for those wells have been thoroughly reviewed and integrated into the well drilling and completion procedures that will be conducted for the injection and monitor wells. These records clearly indicate the top of any abnormally pressured (geopressured) strata is located at a depth well below the base of Sequestration Complex; accordingly, the threat of encountering a geopressured zone during the drilling of any injection or monitor well is highly unlikely.

During the drilling of the injection and monitoring wells, parameters such as flow, volume, and pressure of the drilling fluid, will be closely monitored, as will be all tank fluid levels and fluid circulation rates. Mud weight control will also be utilized to prevent the influx or movement of fluid or gases across zones and to reduce the potential for a loss of well control (kick or blowout) event to occur. Instruments and procedures used for monitoring during drilling will include:

1. Flow sensor
2. Pressure sensor
3. Tank level indicator

4. "Tripping" (replacement of the bottom-hole assembly) displacement practices (pursuant to industry drilling operational procedures)
5. Mud weight control

Controls in place to remediate such an event include the following:

1. Blowout prevention (BOP) equipment
2. "Kill" (high-density) fluid or drilling mud additives on site
3. Well control training (as per the drilling company practices and protocols)
4. BOP testing protocol (per manufacture specifications and state requirements)

These project controls have been historically demonstrated to be effective for well control during the drilling of wells in the project site area.

4.2.2 Response Actions

If a Well Control event occurs, the following response actions will be taken:

1. Cease all drilling operations and assess fluid levels in wellbore.
2. Close the blow out preventor (BOP).
3. Secure the rig floor and surrounding rig area.
4. Initiate the Well Control Procedures.
5. Evaluate the drilling parameters that may have led to the Well Control event or may be used to mitigate the event.
6. Verify cause of the problem and ascertain the risk to human health, if any.
7. Adjust mud weight to suppress the influx or movement of formation fluids or gases.

4.2.3 Response Personnel and Equipment

In addition to the above steps, if a severe Well Control event does occur, the site will be evacuated, and the appropriate emergency response personnel (identified in Section 5.0) will be contacted. The emergency communication plan set forth in Section 6.0 will also be enacted. The cause of the

Well Control event will only be evaluated after the site has been secured and poses no immediate threat to human health and life.

The initial personnel responsible for monitoring and detection will be the rig crew and "tool pusher" rig chief, who will immediately report any indication of a release to the USDW to the company man. The company man will then notify the project supervisor and initiate the first step of the response plan, which is to immediately cease all drilling operations. All tank levels and pressure and flow meters will be checked and recalibrated if required.

If the event is serious to major, the response personnel that would be contacted may also include:

- Local/State police
- Fire Department
- Federal Response Personnel
- Disaster-specific response teams.

Refer to Section 5.0 for contact details.

4.3 INJECTION WELL INTEGRITY FAILURE

The loss of casing integrity in an injection well during active injection could lead to a well failure and potentially endanger the USDW. A loss of integrity and/or well failure may be determined to have occurred based upon the observance of one of the following events:

1. The wellhead pressure deviates significantly from specified / anticipated pressures as set forth in the permits filed for the well;
2. The casing annulus pressure indicates a loss of external or internal well integrity; or
3. An annual MIT indicates a loss of mechanical integrity.

Well failure can be a result of either a casing, tubing or packer failure, or cement degradation from corrosion/erosion due to long-term CO_2 exposure. Automatic alarm and automatic shutoff systems will be installed to trigger digital notification and audible alarms if an injection well loses integrity during operation per 40 CFR 146.88(e)(2).

Pursuant to 40 CFR 146.91(c)(3), Lapis Energy will notify the UIC Program Director within 24 hours of any triggering of a shut-off system (*i.e.*, downhole or at the surface).

4.3.1 Impact Severity and Risk

The potential risk of well integrity failure is low. The mechanical integrity of the well will be demonstrated annually using annulus pressure tests (APT), mechanical integrity tests (MIT), and/or approved cased-hole wireline logging tools (differential temperature survey). Additionally, the annulus system will be continuously monitored to detect for the potential loss of integrity. Such monitoring would also result in the immediate, "real-time" detection of any substantive changes in injection pressures or the rate of flow of injectates into the well. Automatic alarm and shutoff systems will be set to trigger digital notification and audible alarms in the event of loss of integrity, notifying Lapis Energy's operations personnel immediately. Due to this robust system of monitoring and rapid leak detection, the severity and impact of such an incident is expected to be minor. Therefore, it is expected that a loss in injection well integrity will not provide an imminent risk to human health, resources, or infrastructure.

4.3.2 Response Actions

If it is determined that an injection well has suffered a loss of mechanical integrity, either by unexplained deviations observed during continuous monitoring or during annual mechanical integrity testing, Lapis Energy will:

1. Immediately cease injection operations (if not already triggered by automatic shut-off).
2. Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
3. Determine the severity of the event, based on the information available, within 24 hours of notification.

If a loss of mechanical integrity is determined to have occurred, Lapis Energy will initiate the additional steps identified below:

1. Initiate the shutdown plan, which will cut off injection operations to the affected well.

2. If contamination is detected, the facility will identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
3. Run well diagnostics to determine the physical location of leak(s) in the wellbore.
4. Perform remedial workover operations on the well to reestablish mechanical integrity (in consultation with the UIC Program Director).

Once a solution, remedy, or course of action has been determined Lapis Energy will:

1. Notify the UIC Program Director regarding when injection can be expected to resume.
2. Will restore and demonstrate the mechanical integrity of the affected injection well to the satisfaction of the UIC Program Director prior to resuming injection operations.

4.3.3 Response Personnel and Equipment

The initial personnel responsible for monitoring well integrity will be site personnel involved with the well operations: the Operations Manager and his team, the Environmental Health and Safety Manager, and the Drilling Manager. If well integrity has been lost, additional personnel such as, engineering and remediation specialists, will be consulted to determine the extent of the problem and establish a path/solution. The equipment involved in such remediation would likely range from the use of wireline investigative tools, pressure testing gauges, and other remedial equipment, to the potential replacement of the failed surface or downhole equipment, as deemed necessary. External specialists visiting the site will have to adhere to the same safety protocols and standards as Lapis Energy personnel.

Refer to Section 5.0 for contact details.

4.4 INJECTION WELL MONITORING EQUIPMENT FAILURE

Lapis Energy will install and use continuous recording devices to monitor injection pressure, rate, and volume; the pressure on the annulus between the tubing and the long string casing; the annulus fluid volume added; and the temperature of the CO_2 stream, as required per 40 CFR 146.88(e)(1), 146.89(b), and 146.90(b). The failure of installed equipment designed to continuously monitor wellhead pressure, temperature, and/or annular pressure may indicate a mechanical problem has developed in the injection well that could endanger the USDW. All such monitoring equipment

will integrate automatic alarms that, in addition to immediately notifying the appropriate personnel, may trigger an automatic shutdown of injection operations if a serious mechanical problem is detected.

4.4.1 Impact Severity and Risk

The likelihood of failure of one or more of the monitoring components is dependent on the routine maintenance and calibration of such equipment. Lapis Energy will implement a routine inspection and calibration schedule designed for all equipment, including monitoring equipment, that will be utilized in ongoing facility operations. The risk of such equipment failure would thus be low. The impact severity would also be low since the failure of any one component of the monitoring system will not constitute or lead to an immediate risk to human health or infrastructure. Instead, such a failure would simply and temporarily halt injection operations at the facility until the equipment that has failed has been repaired or replaced.

4.4.2 Response Actions

If a component of the monitoring system fails, the following response actions will be performed:

1. Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
2. Determine the severity of the event, based on the information available, within 24 hours of notification.

After the initial assessment, Lapis Energy will:

1. Initiate shutdown plan and cease injection to the affected well(s).
2. Identify the monitoring equipment that either failed or alerted the system to the occurrence of such a failure.
3. Verify that the failure that occurred is only associated with the failure of a component of the monitoring system. **IF** it is determined that the failure is also attributable to a loss of well integrity, follow procedures in Section 4.3 of this plan as well.

4. Check the calibration and run a diagnostic analysis of the equipment that is indicated to have failed per manufacturers specifications.
5. If possible, repair and recalibrate the equipment that failed. Otherwise, replace the equipment that failed with new equipment of a similar or better design.
6. Validate and demonstrate that the repaired or replaced equipment has been successfully brought back online and has continuous monitoring capabilities.
7. Resume injection operations once the complete monitoring system has been restored to full capability and is fully online.

4.4.3 Response Personnel and Equipment

The personnel responsible for response will be those involved with the well operations: the Operations Manager and his team, the Environmental Health and Safety Manager, and the Drilling Manager. The equipment involved in such remediation would likely range from the use of pressure testing gauges and other remedial equipment to the potential replacement of the failed monitoring equipment, as deemed necessary.

Refer to Section 5.0 for contact details.

4.5 POTENTIAL INJECTATE LEAKAGE TO A USDW DURING OPERATIONS

Elevated concentrations of an indicator parameter detected in groundwater samples or other evidence of fluid (brine) or CO_2 leakage into the USDW may be detected during routine sampling. The vertical migration of CO_2 could potentially occur in an injection well, a monitor well, through natural defects in the confining zone, or in a pre-existing artificial penetration (*i.e.*, a legacy well) which may act as a conduit to the USDW within the AoR.

The detection of vertical injectate leakage above the Confining Zone (ACZ) will be facilitated by the real-time continuous monitoring of reservoir pressure as well as adaptive sampling of the saline Tokio Formation, if triggered via pressure and temperature changes. Sampling at any point during injection operations, will be compared to the established baseline sample collected pre-injection. Adaptive groundwater sampling is detailed in the *"E.1 - Testing and Monitoring Plan*" submitted in Module E. Adaptive sampling (frequency and spatial distribution) of the formation directly

overlying the confining zone, may also trigger sampling of shallow ground water monitoring wells completed within the Sparta Aquifer system.

4.5.1 Impact Severity and Risk

Significant mechanical barriers to CO_2 leakage and robust monitoring controls will be put in place to reduce the potential risk of vertical CO_2 leakage to the USDW. In the injection well, all casing strings will be cemented to surface. The cement used across the targeted injection zones of the Lower Hosston and Cotton Valley Formations, will be comprised of a CO_2 resistant cement. There are no known faults or fractures within the modeled AoR that could act as conduits. No faults of fractures have been identified with either the existing well data or with the existing 2D seismic data that has been acquired and reprocessed. Artificial penetrations within the modeled Plume and critical pressure extent are discussed in the "*Area of Review and Corrective Action Plan*" submitted in Module B and have been evaluated on their potential to act as conduits.

Should an unlikely leakage event occur in one of the legacy wells, depending on the amount of CO_2 or brine leakage and the time that might have elapsed between the onset and subsequent discovery of such a leak, the severity of such leakage event could range from minor to serious.

4.5.2 Response Actions

If the vertical leakage of brine or CO_2 has been detected, the following initial steps will be performed:

1. Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
2. Determine the severity of the event, based on the information available, within 24 hours of notification.

After the initial assessment, Lapis Energy will:

1. Initiate a shutdown plan and cease injection operations.
2. Identify the point of potential leakage. Potential sources to be checked are:
    a. Injection wells

   b. Monitoring wells

   c. Legacy wells located within the AoR

3. Initiate adaptive sampling in the ACZ Monitoring Wells.

4. Initiate adaptive sampling of groundwater from the USDW.

5. If the presence of indicator parameters in the groundwater is confirmed, Lapis Energy will develop (in consultation with the UIC Program Director) a case-specific work plan to:

   - Install additional groundwater monitoring points near the affected groundwater well(s) to delineate the extent of impact; and

   - Remediate unacceptable impacts to the affected USDW.

6. Within 24 hours of a release into the USDW, Lapis Energy will notify the local health authority, place a notice in a newspaper of general circulation, and notify adjacent landowners.

7. Arrange for an alternate potable water supply if the contaminated USDW was being utilized and evidence indicates that injectate constituents introduced to the aquifer exceed drinking water standards.

8. Proceed with efforts to remediate the contaminated USDW to mitigate any unsafe conditions (*e.g.*, install system to intercept/extract brine or CO_2 or "pump and treat" to aerate CO_2-laden water).

9. Continue groundwater remediation and monitoring on an adaptive basis (frequency to be determined by Lapis Energy and the UIC Program Director) until the adverse impact on the USDW has been fully addressed.

4.5.3 Response Personnel and Equipment

The responsible parties will be the site personnel involved with the well operations including: the Operations Manager and his team, the Environmental Health and Safety Manager, and the Drilling Manager. Additionally, the project manager, technical consultants, remediation experts, and local health authority will be engaged.

The type of equipment involved in remediation would be dependent on the type and severity of the leak. Such equipment would likely range from the use of workover rigs, additional CO2 resistant cement, and other remedial equipment to the potential installation of downhole remediation equipment (pumps, filters, *etc*.), as deemed necessary.

Refer to Section 5.0 for contact details.

4.6 NATURAL DISASTER

Well problems (integrity loss, leakage, or malfunction) may arise because of a natural disaster affecting the normal operation of the injection well. A moderate to severe earthquake could disturb surface and/or subsurface facilities; and weather-related disasters (*e.g.*, tornado, hurricane, forest fire, or lightning strike) could temporarily affect operations of the surface and monitoring facilities.

Note that the Lapis Energy- El Dorado Facility site is located in the Northern Gulf Coastal Plain, which before 1983 was a region of seismic quiescence. Waste brine disposal operations commenced in 1983, near El Dorado, and resulted in several documented earthquakes attributed to reactivation of the nearby symmetrical graben-horst fault system, the South Arkansas Fault Zone (Cox and VanArsdale, 1991) – located about 7 miles southeast of the facility. Historical documented earthquakes associated with this fault system are well below damaging levels and are primarily located south of the site along the fault zone and would not impact the integrity of injection operations. Additionally, routine sequestration operations will be performed at low injection rates and injection pressures will remain at below 90% of the formation fracture gradients. Adherence to these low injection rate, pressure and fracture gradient operations will help minimize any potential induced seismic events. Detailed information on the seismicity of southern Arkansas within the AoR and the surrounding Union County area is contained within Section 2.5 – Seismicity of the "*Project Narrative Report*" submitted in Module A.

A potential natural disaster related to severe weather (lighting, tornadoes, flooding, freezing, forest fire, *etc.)* could temporarily impact the AoR and impede the normal operation of the facility as well as access to the injection and monitor wells. Over the past 20 years, the largest natural disaster risk is related to flooding or severe weather events.

4.6.1 Impact Severity and Risk

The impact severity could range from a minor to a major event for all natural disasters. The event severity would be dependent upon the type and cause of the natural disaster. A severe natural disaster could temporarily limit safe access to the injection and monitor wells. However, historical weather and climate patterns of the region indicate a low level of risk for a serious event caused by a natural disaster. Regardless, the threat of all potentially severe event occurrences is being considered.

4.6.2 Response Actions

Regardless of the level of severity, the following initial responses will be taken:

1. Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
2. Determine the severity of the event (minor, serious, or major), based on the information available, within 24 hours of notification.
3. Evaluate and determine if attempted access to the injection or monitor wells immediately following the occurrence of such an event would constitute a risk to personnel safety.

Once a severity level has been determined, additional response actions will be taken. See the following subsections.

4.6.2.1 Major or Serious Emergency

1. Initiate the shutdown plan and cease injection.
2. Check for additional hazardous conditions that may have resulted from the natural disaster.
3. Determine the accessibility to the injection and monitor wells.
4. Perform safety checks for all personnel regarding hazards.
    a. If the site poses an immediate threat to human life or safety, evacuate the site to pre-determined muster points. Contact emergency personnel if warranted (911). Wait until the immediate threat has passed to evaluate damage and

develop remedial procedures with UIC Program Director and local response personnel.

b. If the site can be safely accessed, secure the injection and monitor wells and the surrounding area. Evaluate the damage to the wells, the surface facilities, and to the environment and develop a procedure to remediate with the UIC Program Director.

c. If contamination or the potential for endangerment is detected, identify, and implement appropriate remedial actions (in consultation with the UIC Program Director), if the site conditions are safe for personnel.

5. Notify local health authority and first responders if the event and conditions pose a threat to the safety of the community.

Once a solution, remedy, or course of action has been determined, Lapis Energy will:

1. Notify the UIC Program Director regarding when injection can be expected to resume.
2. Will restore operational capability to and demonstrate the mechanical integrity of all injection and monitor wells to the satisfaction of the UIC Program Director prior to resuming injection operations.

4.6.2.2 Minor Emergency

1. Conduct assessment to determine whether there has been a loss of mechanical integrity because of the natural disaster.
2. If there has been a loss of mechanical integrity, initiate shutdown plan and follow the steps outlined in Section 4.3.2 of this plan.

Once a solution, remedy, or course of action has been determined, Lapis Energy will:

1. Notify the UIC Program Director regarding when injection can be expected to resume.
2. Will restore operational capability to and demonstrate mechanical integrity of all injection and monitor wells to the satisfaction of the UIC Program Director prior to resuming injection operations.

4.6.3 Response Personnel and Equipment

The response personnel that would be contacted or deployed immediately following the occurrence of a natural disaster will be dependent on severity of the event. At a minimum (minor event) level, the following personnel will be contacted:

- Lapis Energy – Operations Manager on duty
- El Dorado Chemical Company – GM Eldorado
- El Dorado Chemical Company – Facility Manager on duty
- Lapis Energy – Senior Project Manager (PM)
- Lapis Energy - Remediation contractors
- Lapis Energy - Corporate Communications

If the event is serious to major, the response personnel that would be contacted may also include:

- Local/State police
- Fire Department
- Federal Response Personnel
- Disaster-specific response teams.

A listing of all potential response personnel for the public is contained in the following section.

Refer to Section 5.0 for contact details.

4.7 POTENTIAL TOPSIDES FACILITY FAILURE

Topsides (surface) facility failure will have little impact on USDW, but does have the risk of personnel injury, and facility shutdown. Possible over pressurization of topsides facility can result in catastrophic failure and potential personnel injury, as well as possible topsides facility failure of CO_2 containment loss resulting in possible exposure to personnel (very low risk, non-confined space)

4.7.1 Impact Severity and Risk

The design robustness will be the main mitigation against over pressurization failure and CO_2 leakage to atmosphere. While the USDW will not be affected by a potential topsides failure, it does pose a risk to personnel.

Should an unlikely event occur the severity of the incident could range from minor to serious.

4.7.2 Response Actions

If a topsides failure has occurred resulting in personnel injury or a loss of CO_2 containment, the following initial steps will be performed:

1. Initiate a shutdown plan and cease injection operations as soon as the event has occurred.
2. Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
3. Determine the severity of the event, based on the information available, within 24 hours of notification.

After the initial assessment, Lapis Energy will:

1. Identify the point of potential leakage. Potential sources to be checked.

4.7.3 Response Personnel and Equipment

The responsible parties will be the site personnel involved with the injection operations including: the Operations Manager and his team, the Environmental Health and Safety Manager. Additionally, the Project Manager, technical consultants, remediation experts, and local health authority will be engaged.

The type of equipment involved in remediation would be dependent on the type and severity of the failure.

Refer to Section 5.0 for contact details.

5.0 OVERALL RESPONSE PERSONNEL AND EQUIPMENT

Site personnel, project personnel, and local authorities will be relied upon to implement this ERRP. Site personnel to be notified (not listed in order of notification):

Table 3: Contact Information for Project Blue Affiliated personnel (table will be updated prior to permit to construct, based on most up to date information)

Company	Authority or Location	Phone Number
Lapis Energy (AR Development) LP	Operations Manager	TBD
Lapis Energy (AR Development) LP	Injection well operator on duty	TBD
Lapis Energy (AR Development) LP	Project Manager	TBD
Lapis Energy (AR Development) LP	HSE Manager	TBD
Lapis Energy (AR Development) LP	Corporate Communications	TBD
El Dorado Chemical Company	Facilities Safety Manager(s)	TBD
El Dorado Chemical Company	Environmental Manager(s)	TBD
El Dorado Chemical Company	Plant Manager	TBD
El Dorado Chemical Company	Plant Superintendent	TBD
El Dorado Chemical Company	All facility personnel	TBD
Lapis Energy (AR Development) LP	Remediation contractors	TBD
Lapis Energy (AR Development) LP	Well Engineering manager	TBD
Lapis Energy (AR Development) LP	Drilling “tool pusher” rig chief,	TBD
Lapis Energy (AR Development) LP	Drilling The company man	TBD
Lapis Energy (AR Development) LP	Drilling project supervisor	TBD

A site-specific emergency contact list will be developed and maintained during the life of the project. Lapis Energy will provide the current site-specific emergency contact list in Table 3 to the UIC Program Director.

Table 4: Contact Information for Key Local, State, and Other Authorities

Agency	Authority or Location	Phone Number
Local Police	El Dorado Police Department	911 or (870) 881-4800
Local Fire	El Dorado Fire Department	911 or (870) 881-4855
Local Hospital	Medical Center of South Arkansas	911 (870) 863-2000
Local County Emergency Management	Union County Office of Emergency Management	870-864-1906 (TBC)
Sheriff	Union County Sheriff's Office	911 or (870) 864-1970
State Police	Arkansas State Police	911 or (501) 618-8000
State Emergency Management Agency	Arkansas Division of Emergency Management (ADEM)	(501) 683-6700
Environmental Services Contractor	Vendor to be Determined	--
ADEQ UIC Program Director	North Little Rock, Arkansas	(501) 682-0744
EPA Region 6 UIC Class VI Director	Dallas, Texas	(214) 665-7150
EPA National Response Center (24 hours)	--	(800) 424-8802
Arkansas State Geological Survey	North Little Rock, Arkansas	(501) 296-1877

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

At any given moment the public might have questions with regards to the ongoing operations, not related to a specific emergency event. To accommodate these questions Lapis Energy has implemented an email address (Info@eldoradoCCS.com) and phone number (870) 724-4016, where the public can make general inquiries, with regards to the project. These communication channels will be promoted on the Lapis Energy website and via other means.

6.0 EMERGENCY COMMUNICATIONS PLAN

At the earliest possible opportunity, Lapis Energy will promptly communicate to the public about any event that requires an emergency response. This will ensure that the public understands what happened and whether there are any environmental or safety implications. The amount of information, timing, and communications method(s) will be appropriate to the event, its severity, whether any impacts to drinking water or other environmental resources occurred, any impacts to the surrounding community, and their awareness of the event.

Lapis Energy will describe what happened, any 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), Lapis Energy will provide periodic updates on the progress of the response action(s).

Lapis Energy will also communicate with entities that may need to be informed about or act in response to the event, including local water systems, pipeline operators, landowners, and Regional Response Teams (as part of the National Response Team). Additional agencies will be contacted if affected.

An emergency contact list will be maintained during the lifetime of the project (Construction, Operation, and Closure). The emergency contact list will be comprised of all facility management and essential personnel that would be notified, activated and/or deployed in the case of an event. One person will be designated by the facility to handle all points of communication with the public.

7.0 PLAN REVIEW PROCESS

This ERRP shall be reviewed:

- At least once every five (5) years following its approval by the permitting agency;
- Within one (1) year of any AOR re-evaluation;
- Within one (1) year following any significant changes to the injection process or the injection facility, or an emergency event; or
- As required by the permitting agency.

If the review indicates that no amendments to the ERRP are necessary, Lapis Energy 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 a reasonable timeframe to be agreed upon with all affected parties and authorized regulatory bodies following an event that initiates the ERRP review procedure.

8.0 STAFF TRAINING AND EXERCISE PROCEDURES

Lapis Energy will develop a training plan (with accompanying manual) for all facility employees. The manual will be developed in alignment with standards set forth by the Occupational Safety and Health Administration (OSHA). Training will be provided to all personnel that will be involved with the injection and monitor wells, the monitoring systems, and the surface facility systems. Training will be periodic and completed on an annual basis (at a minimum).

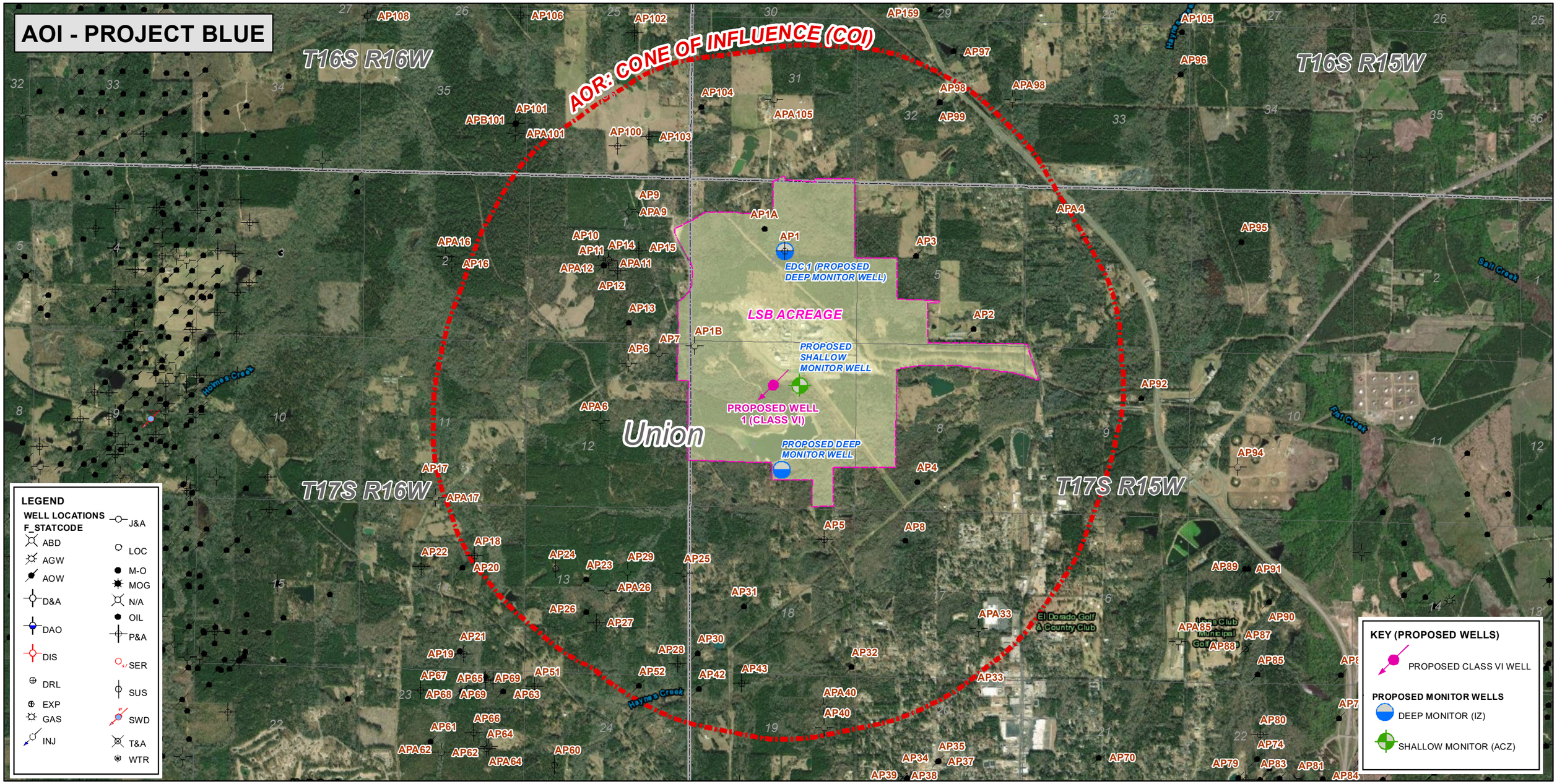
All personnel will be required to wear personal protective equipment (PPE) while they are working at the project site. The minimum PPE that will be required while onsite will apply to all personnel, contractors, and visitors: It will consist of the following:

- Hard hats
- Safety glasses
- Protective footwear (safety-toed boots)

The specific training, required PPE, and exercise plan will be finalized once the project is ready to go online. All personnel will be trained prior to the commencement of operations at the El Dorado Facility site. Personnel will also participate in routine retraining and skill-specific "refresher" courses over the life of the project. Some roles will require annual, or semi-annual, updates to their training program (to be identified once those roles are established).

FIGURES

Geostock Sandia



VICINITY INSET MAP

Coordinate System: NAD 1927 StatePlane Arkansas South FIPS 0302
Projection: Lambert Conformal Conic
Datum: North American 1927
False Easting: 2,000,000.0000
False Northing: 0.0000
Central Meridian: -92.0000
Standard Parallel 1: 33.3000
Standard Parallel 2: 34.7667
Latitude Of Origin: 32.6667
Units: Foot US

N

0 1,500 3,000 6,000 9,000 Feet

0 0.2 0.4 0.8 1.2 1.6 Miles

KEY

PROPOSED CLASS VI WELL

AOR: CONE OF INFLUENCE (COI)

LEE: LBS ACREAGE

Lapis Energy - Project Blue (Union Co., AR)
NOTE: O&G Well Locations based from data licensed from ENVERUS, TOBIN, IHS, and AOGC and QC'd for final well locations 11/2022; within AR: Union Parish ONLY.

Lapis Energy

ERR E.4 - FIGURE 1
LOCATIONS OF RESOURCES & INFRASTRUCTURE NEAR THE LAPIS ENERGY PROJECT BLUE SITE (AERIAL LOOK)

UNION CO.,ARKANSAS

GEODETIC DATUM: NAD27 SP AR S PROJECTION: LAMBERT CONFORMAL CONIC GRID UNITS: FEET	SCALE: SEE SCALEBAR 1" = 3000' (1:36K) PRINT SIZE: 17" x 11" (Ledger)

DATE: 12/29/2022	PROJECT NAME: 220031-LEE	MAP BY: ESSJ (GKS) CHECK BY: DC (GKS)	SHEET: 1 OF 1

Geostock Sandia

AOI - PROJECT BLUE

AOR: CONE OF INFLUENCE (COI)

T16S R16W

T16S R15W

T17S R16W

T17S R15W

Union

LISBON OILFIELD GASFIELD

LSB ACREAGE

EDC 1 (PROPOSED DEEP MONITOR WELL)

PROPOSED SHALLOW MONITOR WELL

PROPOSED WELL 1 (CLASS VI)

PROPOSED DEEP MONITOR WELL

AP108 AP106 AP102 AP159 AP105 AP97 AP96 AP104 AP101 APB101 APA101 AP100 AP103 APA105 AP98 AP99 APA98 AP9 APA9 AP1A AP1 AP3 APA4 AP95 APA16 AP16 AP10 AP11 AP14 AP15 APA12 APA11 AP12 AP13 AP2 AP7 AP1B AP6 APA6 AP92 AP17 APA17 AP4 AP94 AP18 AP20 AP22 AP24 AP23 AP29 AP25 APA26 AP26 AP27 AP31 AP5 AP8 AP89 AP91 AP90 APA33 APA85 AP87 AP88 AP85 AP21 AP19 AP28 AP30 AP32 AP67 AP65 AP69 AP68 AP63 AP51 AP52 AP42 AP43 APA40 AP40 AP66 AP61 AP64 APA62 AP62 APA64 AP60 AP35 AP37 AP34 AP38 AP39 AP70 AP80 AP74 AP79 AP83 AP81 AP84

Holmes Creek

Salt Creek

Flat Creek

Mt Holly Rd

Union Road 76.7

Moody Ln

Morning Star Rd

Mule Grove Rd

Wildwood Dr

Smackover Hwy

Calion Hwy

Old Calion Rd

Chemical Company Rd

Walter Dr

Agnes Rd

W 19th St

E 19th St

Griffith St

N West Ave

N Roselawn Ave

El Dorado Golf & Country Club

Lions Club Municipal Golf

LEGEND

WELL LOCATIONS F_STATCODE

- ABD
- AGW
- AOW
- D&A
- DAO
- DIS
- DRL
- EXP
- GAS
- INJ
- J&A
- LOC
- M-O
- MOG
- N/A
- OIL
- P&A
- SER
- SUS
- SWD
- T&A
- WTR

KEY (PROPOSED WELLS)

- PROPOSED CLASS VI WELL

PROPOSED MONITOR WELLS

- DEEP MONITOR (IZ)
- SHALLOW MONITOR (ACZ)

VICINITY INSET MAP

Clark, Dallas, Cleveland, Lincoln, Desha, Little River, Hempstead, Nevada, Ouachita, Calhoun, Bradley, Drew, Arkansas, Miller, Lafayette, Columbia, AOI, Union, Ashley, Chicot, Caddo, Bossier, Webster, Claiborne, Union, Morehouse, West Carroll, East Carroll, Louisiana, Lincoln, Bienville, Jackson, Ouachita, Richland, Madison

Coordinate System: NAD 1927 StatePlane Arkansas South FIPS 0302
Projection: Lambert Conformal Conic
Datum: North American 1927
False Easting: 2,000,000.0000
False Northing: 0.0000
Central Meridian: -92.0000
Standard Parallel 1: 33.3000
Standard Parallel 2: 34.7667
Latitude Of Origin: 32.6667
Units: Foot US

N

0 1,500 3,000 6,000 9,000 Feet

0 0.2 0.4 0.8 1.2 1.6 Miles

KEY

- PROPOSED CLASS VI WELL
- AOR: CONE OF INFLUENCE (COI)
- LEE: LBS ACREAGE

Lapis Energy - Project Blue (Union Co., AR)
NOTE: O&G Well Locations based from data licensed from ENVERUS, TOBIN, IHS, and AOGC and QC'd for final well locations 11/2022; within AR: Union Parish ONLY.

Lapis Energy

ERR E.4 - FIGURE 2
LOCATIONS OF RESOURCES & INFRASTRUCTURE NEAR THE LAPIS ENERGY PROJECT BLUE SITE (TOPO LOOK)

UNION CO.,ARKANSAS

GEODETIC DATUM: NAD27 SP AR S PROJECTION: LAMBERT CONFORMAL CONIC GRID UNITS: FEET	SCALE: SEE SCALEBAR 1" = 3000' (1:36K) PRINT SIZE: 17" x 11" (Ledger)

DATE: 12/29/2022	PROJECT NAME: 220031-LEE	MAP BY: ESSJ (GKS) CHECK BY: DC (GKS)	SHEET: 1 OF 1

Geostock Sandia