10. EMERGENCY AND REMEDIAL RESPONSE PLAN
40 CFR 146.94

CAPIO MOUNTAINEER SEQUESTRATION PROJECT

Facility Information

Facility name:	MOUNTAINEER GIGASYSTEM
Facility contact:	Michael Neese Vice President, Operations and Project Development [redacted]
Well name:	MCCLINTIC SEQUESTRATION 001
Well location:	MASON COUNTY, WEST VIRGINIA Latitude: [redacted] Longitude:

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10.0 Emergency and Remedial Response Plan

10.1 Introduction (CFR 40 146.94 (a)(b)(c))

Fidelis, LLC ("Fidelis") will operate the Capio Mountaineer Sequestration project, inclusive of the capture plant, pressure lines and injection well.

This Emergency and Remedial Response Plan (ERRP) describes actions that Fidelis will take to address movement of the injection fluid 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 injection well MCCLINTIC SEQUESTRATION 001, in accordance with 40 CFR146.94.

An emergency shutdown of the injection well will be triggered if Fidelis obtains evidence that the injected carbon dioxide (CO_2) stream and/or associated pressure front may cause an endangerment to a USDW. If such an event should occur, Fidelis will perform the following actions:

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) Director of the emergency event within 24 hours.
4. Implement applicable portions of the ERRP.

If an emergency shutdown should occur, CO_2 injection will only resume with the consent of the UIC Director. If Fidelis can demonstrate that the injection operation will not endanger USDWs, the UIC Director may allow the resumption of injection prior to remediation.

If a non-emergency shutdown of the CO_2 injection system is required, the operator will complete the shutdown in a stepwise approach to prevent over-pressure situations and/or damage to the equipment. Efforts will also be made to maintain the CO_2 in the injection stream in a supercritical phase to prevent special operations during the restart of the system.

10.2 Local Resources and Infrastructure

Resources in the vicinity of the Capio Mountaineer Sequestration project that may be affected as a result of an emergency event at the project site include USDWs within an existing network of shallow groundwater wells and any newly drilled groundwater wells associated with the Testing and Monitoring program.

Regional freshwater aquifers include shallow alluvium aquifers along the Ohio and Kanawha Rivers and bedrock aquifers within Upper Pennsylvanian formations (Permit Section 1.0, **Figure 1-19**). Shallow groundwater moves to nearby valleys from upland intake areas and is released into stream beds or discharged into springs and seeps (Wilmoth, 1966). Unconsolidated clastics

ranging from clay, silt, sand, gravel and boulders comprise alluvial aquifers. Alluvium aquifers along the Kanawha River are found to contain higher proportions of clay and silt (Kozar and Mathes, 1991). There are no active springs within the AoR (USGS, 2020).
All water wells within the AoR are shown below in **Figure 10-1**. Details of their use (irrigation, domestic etc.) are given in Section 2.4.1 of the AoR and Corrective Action Plan (Permit Section 2.0).

The land within the area of review (AoR) consists primarily of farmland, brushland, wetland, and mixed hardwood forests with sparse residential and agricultural buildings. [redacted].

Resources and infrastructure addressed in this plan are shown in **Figures 10-1, 10-2 and 10-3**.

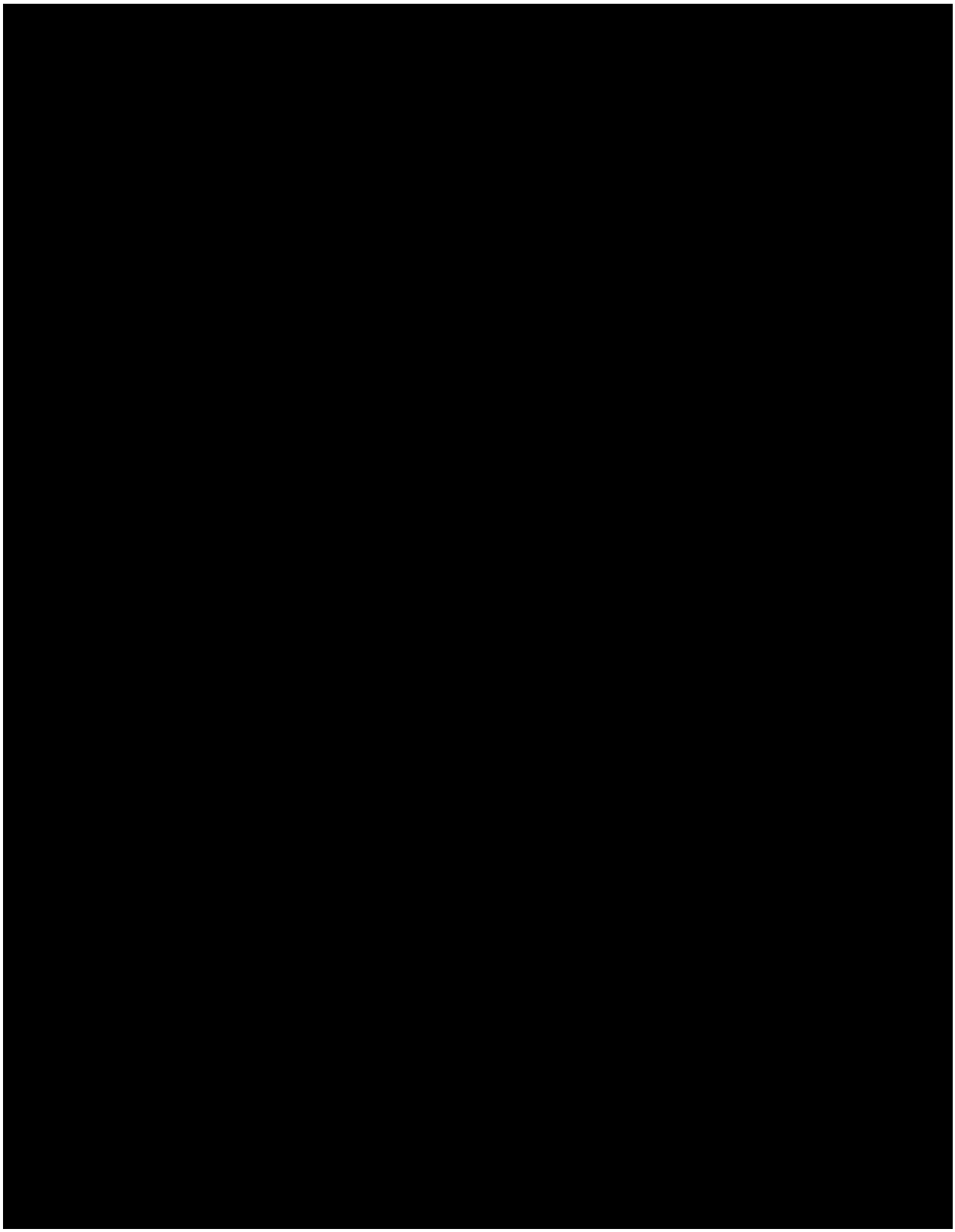

Figure 10-1: Map of Capio Mountaineer Sequestration Project showing proposed injection well location, AoR, FEMA flood zones and local infrastructure.

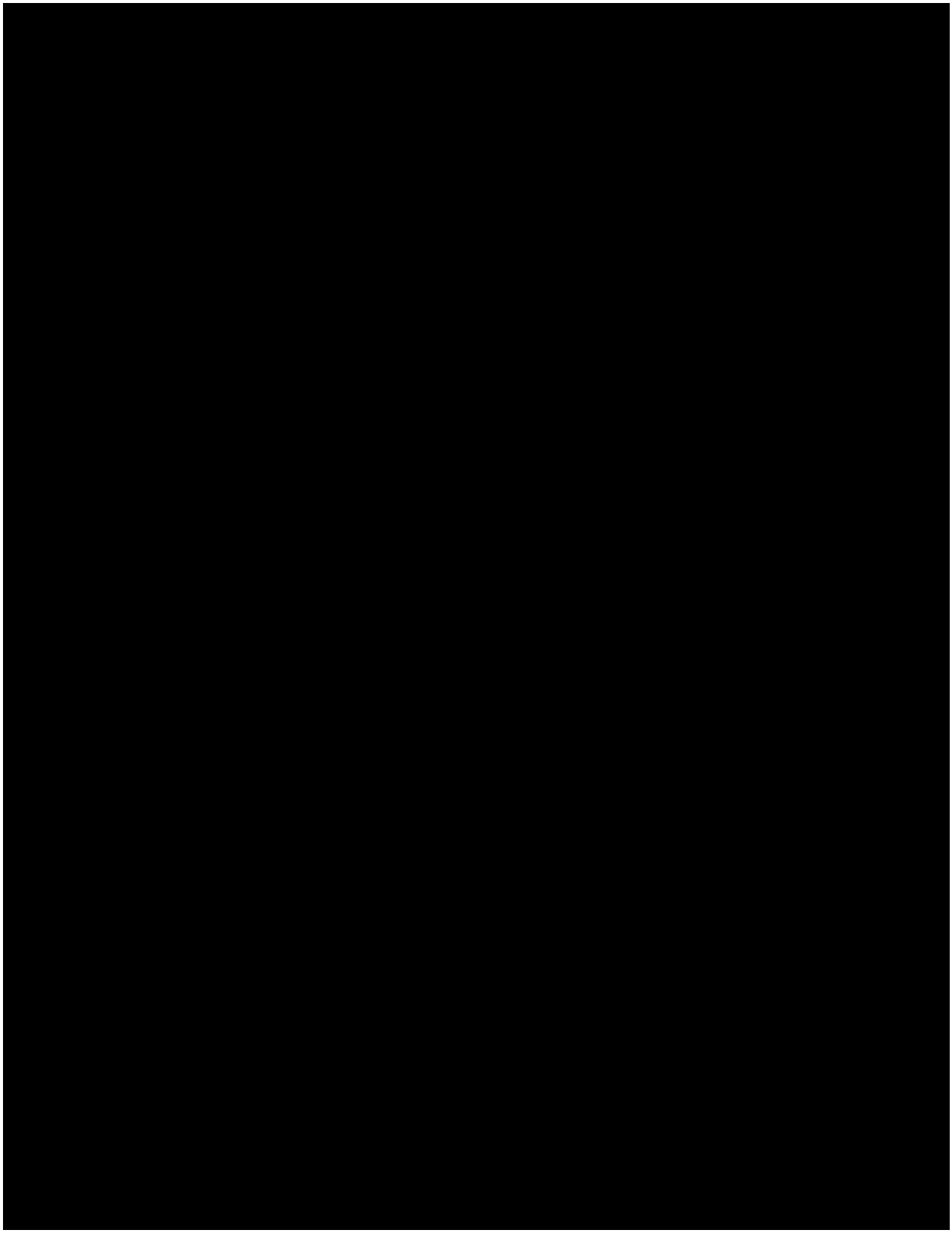

Figure 10-2: Map of Capio Mountaineer Sequestration Project showing proposed injection well location, AoR, Wildlife Management Area (WMA).

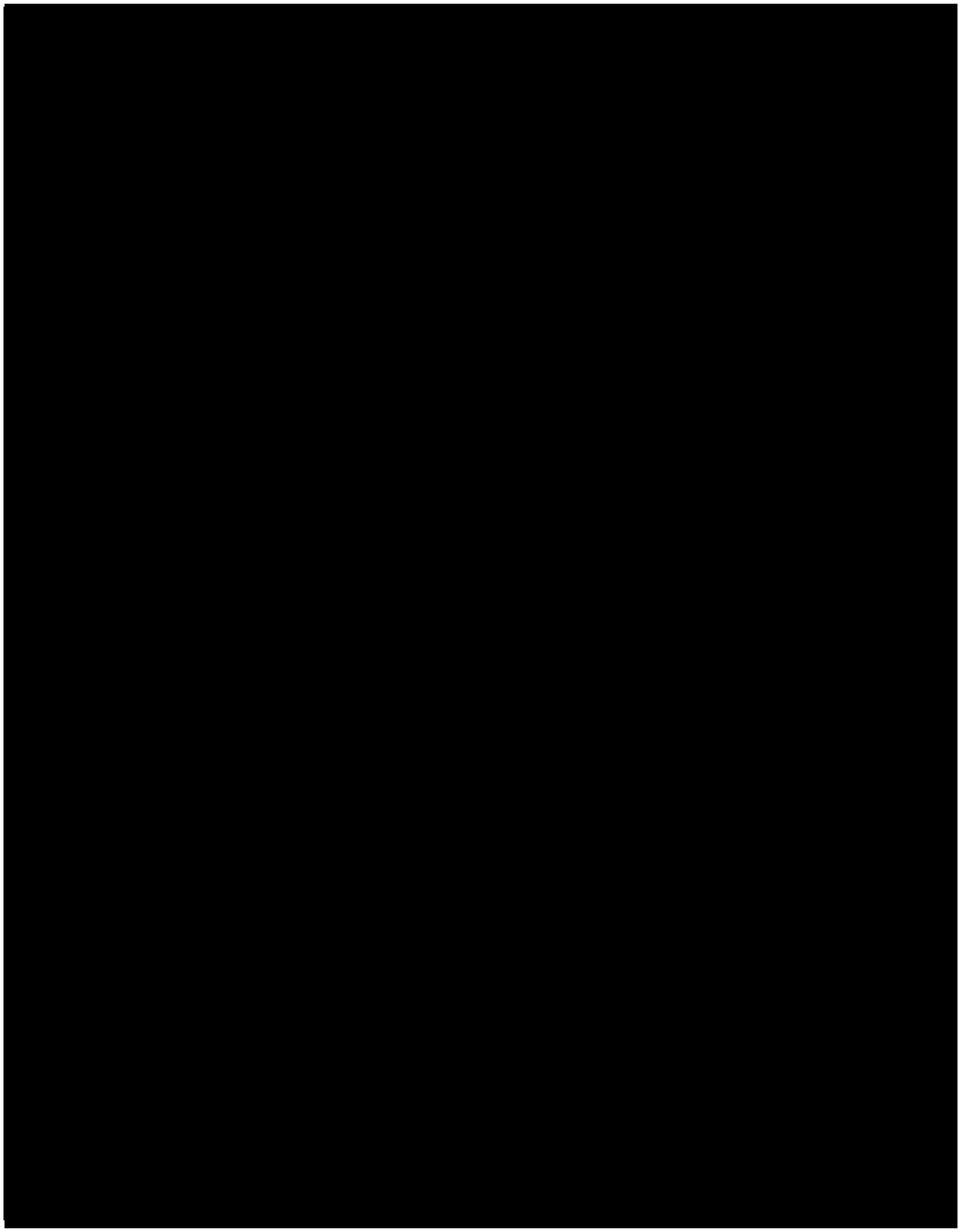

Figure 10-3: Map of Capio Mountaineer Sequestration Project showing proposed injection well location, AoR, EPA Superfund Site.

10.3 Potential Risk Scenarios

The following events related to the Capio Mountaineer Sequestration project could potentially result in an emergency response:

1. Injection well or deep monitoring well integrity failure
2. Injection well monitoring equipment failure (e.g., shut-off valve or pressure gauge, etc.)
3. A natural disaster (e.g., earthquake, tornado, lightning strike).
4. Fluid (e.g., brine) leakage to a USDW
5. CO_2 leakage to USDW or land surface.
6. Induced seismic event.

Response actions will depend on the severity of the event(s) triggering an emergency response and are categorized below in **Table 10-1**.

In addition to the potential risk scenarios listed above a project risk assessment has been undertaken. A summary of this exercise is shown in **Appendix A** which describes the main risks identified for this project.

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

Table 10-1: Severity of risk for emergency events.

10.4 Emergency Identification and Response Actions

Steps to identify and characterize an emergency event will be dependent on the specific issue identified and the severity of the event. Each of the potential risk scenarios identified in the previous section are detailed below.

10.4.1 Well Integrity Failure

Integrity loss of the injection well and/or the deep monitoring well may endanger USDWs. A potential well integrity failure may have occurred if the following events occur:

- Automatic shutdown devices are activated due to:
    - Wellhead (injection) pressure exceeds the maximum operating pressure specified in the permit.
    - Annulus pressure indicates a loss of external or internal well containment.
- Mechanical integrity test (MIT) results identify a loss of mechanical integrity.

Response actions for the situations listed above are detailed below in **Table 10-2**.

Emergency Condition	Response Action and Notification Procedures
All	1. Notify Fidelis, VP of Operations. 2. Determine the severity of the event, based on the information available, within 24 hours of notification. 3. Notify the UIC Director within 24 hours of the emergency event, per 40 CFR 146.91(c). 4. After an initial assessment, the VP of Operations will notify other Project Management and Operational Personnel.
Major or Serious	1. Initiate shutdown plan as follows. a. Shut in well (close injection valve). Prior to closing the injection valve, notify plant personnel to direct CO_2 to the primary vent. b. Mark an exclusion zone around the affected area/well to limit access to authorized personnel only, if warranted. c. Notify plant safety manager that the well has been shut down. d. Notify local authorities and plant personnel, as necessary. e. If the evacuation plan must be implemented, notify all surrounding businesses and offices, as warranted and local authorities. f. Evaluate the recent and current well conditions (i.e., pressures, temperatures, and annulus pressure) to determine potential causes and the extent of any failure, as well as any additional steps in the emergency procedure. 2. Evaluate whether any leaks to groundwater or surface water occurred. 3. If contamination of groundwater or surface water is detected, identify, and implement appropriate remedial actions (in consultation with the UIC Director).
Minor	1. Conduct assessment to determine whether there has been a loss of mechanical integrity. 2. If there has been a loss of mechanical integrity, initiate shutdown plan. 3. For shutdown plan, implement the following: a. Shut in well (close flow valve). Prior to closing the flow valve, notify plant personnel to direct CO_2 to the primary vent. b. Mark an exclusion zone around the affected well to limit access to the well to authorized personnel only. c. Notify plant safety personnel that the well has been shut down. d. Monitor the well conditions (i.e., pressures, temperatures, and annulus pressure) to determine potential causes and the extent of any failure. e. Identify and, if necessary, implement appropriate remedial actions in consultation with the UIC Director.

Table 10-2: Response actions to an emergency associated with well integrity failure.

10.4.2 Injection Well Monitoring Equipment Failure

The failure of monitoring equipment for wellhead pressure, temperature, and/or annulus pressure may indicate a problem with the injection well that could endanger USDWs. Most equipment failures can be rapidly addressed by replacing failed pieces of equipment and are likely minor emergencies. However, if the situation cannot be quickly addressed, system shutdown may be required.

The response actions to an emergency associated with well equipment failure are detailed below in **Table 10-3**.

Emergency Condition	Response Action and Notification Procedures
All	1. Notify Fidelis, VP of Operations. 2. Determine the severity of the event, based on the information available, within 24 hours of notification. 3. Notify the UIC Director within 24 hours of the emergency event, per 40 CFR 146.91(c). 4. After an initial assessment, the VP of Operations will notify other Project Management and Operational Personnel.
Major or Serious	a. Initiate shutdown plan as follows. b. Shut in well (close injection valve). Prior to closing the injection valve, notify plant personnel to direct CO_2 to the primary vent. c. Mark an exclusion zone around the affected well to limit access to area/well to limit access to authorized personnel only, if warranted. d. Notify plant safety manager that the well has been shut down. e. Notify local authorities and plant personnel, as necessary. f. Monitor the well conditions (i.e., pressures, temperatures, and annulus pressure) to determine additional steps in the emergency procedure. g. Identify and, if necessary, implement appropriate remedial actions (in consultation with the UIC Director).
Minor	1. Conduct assessment to determine whether there has been an injection well equipment failure. 2. If there has been an injection well equipment failure, initiate shutdown plan as follows. 3. For shutdown plan, implement the following: a. Shut in well (close flow valve). Prior to closing the flow valve, notify plant personnel to direct CO_2 to the primary vent b. Reset or repair automatic shutdown devices, if necessary. c. Monitor the well conditions (i.e., pressures, temperatures, and annulus pressure) to determine potential causes and the extent of any failure. 4. Repair or replace monitoring equipment that failed. 5. Identify and, if necessary, implement appropriate remedial actions in consultation with the UIC Director.

Table 10-3: Response actions to an emergency associated with well equipment failure.

10.4.3 Potential Brine or CO_2 Leakage to USDW

Elevated concentrations of indicator parameter(s) in groundwater sample(s) from groundwater wells or increased pressures in the above confining zone (ACZ) well may indicate fluid (brine) or CO_2 leakage into a USDW.

The response actions to an emergency associated with potential brine or CO_2 leakage to a USDW are detailed below in **Table 10-4**.

Emergency Condition	Response Action and Notification Procedures
All	1. Notify Fidelis, VP of Operations. 2. Determine the severity of the event, based on the information available, within 24 hours of notification. 3. Notify the UIC Director within 24 hours of the emergency event, per 40 CFR 146.91(c). 4. After an initial assessment, the VP of Operations will notify other Project Management and Operational Personnel. 5. For all cases of confirmed migration of CO_2 to a USDW: a. Initiate shutdown plan. i. Shut in well (close flow valve). Prior to closing the flow valve, notify plant personnel to direct CO_2 to the primary vent. ii. Mark an exclusion zone around the affected well to limit access to the affected area/well to limit access to authorized personnel only, if warranted. iii. Notify plant safety manager that the well has been shut down. iv. Notify local authorities and plant personnel, as necessary. v. Monitor the well conditions (i.e., pressures, temperatures, geochemical parameter, temperature data, etc.) to determine additional steps in the emergency procedure. b. Collect confirmation sample(s) of groundwater and analyze indicator parameters. See Table 7-6 of the Testing and Monitoring Plan. 6. If the leakage of CO_2 is confirmed, develop (in consultation with the UIC Director) a case-specific plan with various methods to address any unacceptable impacts to the affected USDW while achieving certain goals. The goals and proposed methods are as follows: a. Install additional groundwater monitoring points near the affected groundwater well(s) to delineate the extent of impact, if warranted. b. Remediate the affected USDW to mitigate any unsafe conditions through the installation of: i. A system to intercept and extract non-native fluid or CO_2; or ii. A pump-and-treat type system to aerate the water contaminated with CO_2 to purge the CO_2 from the water. c. Arrange for an alternate potable water supply if the USDW was being utilized as a drinking water source and has exceeded drinking water standards by CO_2 or brine infiltration. d. Continue groundwater remediation and monitoring on a frequent basis (frequency to be determined by Fidelis and the UIC Director) until unacceptable adverse USDW impact has been addressed.

Table 10-4: Response actions to an emergency associated with potential Brine or CO_2 leakage to a USDW.

10.4.4 Natural Disaster

Well problems (integrity loss, leakage, or malfunction) may arise because of a natural disaster affecting the normal operation of the injection well. An earthquake may disturb surface and/or subsurface facilities and weather-related disasters (e.g., tornado or lightning strike) may affect surface facilities. The Capio Mountaineer Sequestration Project lies partially within the FEMA AE Zone for floodplains (**Figure 10-1**).

The response actions to an emergency associated with a natural disaster are detailed below in **Table 10-5**.

Emergency Condition	Response Action and Notification Procedures
All	1. Notify Fidelis, VP of Operations. 2. Determine the severity of the event, based on the information available, within 24 hours of notification. 3. Notify the UIC Director within 24 hours of the emergency event, per 40 CFR 146.91(c). 4. After an initial assessment, the VP of Operations will notify other Project Management and Operational Personnel.
Major or Serious	1. Initiate shutdown plan. a. Confirm no leakage from the CO_2 injection system. b. Shut in well (close flow valve). Prior to closing the flow valve, notify plant personnel to direct CO_2 to the primary vent. c. Mark an exclusion zone around the affected well to limit access to authorized personnel only, if warranted. d. Notify local authorities and plant personnel, as necessary. e. Determine if any leaks to groundwater or surface water occurred. f. Monitor the well conditions (i.e., pressures, temperatures, etc.) to determine additional steps in the emergency procedure. 2. If contamination or endangerment is detected, identify, and implement appropriate remedial actions (in consultation with the UIC Director).
Minor	1. Conduct assessment to determine whether there has been a loss of mechanical integrity. 2. If there has been a loss of mechanical integrity, initiate shutdown plan. For shutdown plan, implement the following: i. Shut in well (close flow valve). Prior to closing the flow valve, notify plant personnel to direct CO_2 to the primary vent. ii. Monitor the well conditions (i.e., pressures, temperatures, and annulus pressure) to determine potential causes and the extent of any failure. 3. Identify and, if necessary, implement appropriate remedial actions in consultation with the UIC Director.

Table 10-5: Response actions to an emergency associated with a natural disaster.

10.4.5 Seismic Event

The Capio Mountaineer Sequestration project site is in a stable region for natural seismicity. To monitor the AoR for any potential seismic activity, a network of surface seismological stations will be deployed to continuously record background seismic activity. The number of required stations will be determined based on a site-specific modeling exercise incorporating the AoR and the seismic event magnitudes to be monitored. Baseline microseismic data will be acquired at least six months prior to the start of injection operations. Seismic event data will be processed to provide seismic moment magnitude and precise location and depth information on a real-time basis and reported daily, should any occur.

Based on the periodic analysis of the monitoring data, observed level of seismic activity, and local reporting of felt events, the site will be assigned an operating state based on the protocol described in **Table 10-6**. The operating state is determined using threshold criteria which correspond to the site's potential risk and level of seismic activity. The operating state provides operating personnel information about the potential risk of further seismic activity and guides them through a series of response actions.

Operating State	Threshold Condition	Response Action
Green	Seismic events less than or equal to M2.5	1. Continue normal operation within permitted levels.
Yellow	Five (5) or more seismic events within a 30-day period having a magnitude greater than M2.5 but less than or equal to M3.0	1. Continue normal operation within permitted levels. 2. Within 24 hours of the fifth event, notify the UIC Director of the operating status of the well.
Orange	Seismic event greater than M2.5 and local observation or felt report Seismic event greater than M3.0 and no felt report	1. Continue normal operation within permitted levels. 2. Review seismic and operational data. 3. Within 24 hours of the incident, notify the UIC Director of the operating status of the well. 4. Report findings to the UIC Director and issue corrective actions.
Magenta	Seismic event greater than M3.0 and local observation or report	1. Review seismic and operational data. 2. Initiate rate reduction plan. 3. Within 24 hours of the incident, notify the UIC Director of the operating status of the well. 4. Communicate with facility personnel and local authorities to initiate evacuation plans, as necessary. 5. Monitor well pressure, temperature, and annulus pressure to verify well status and determine the cause and extent of any failure; identify and implement appropriate remedial actions (in consultation with the UIC Director). 6. Determine if leaks to ground water or surface water occurred. 7. If USDW contamination is detected, notify the UIC Director within 24 hours of the determination. 8. Report findings to the UIC Director and issue corrective actions.
Red	Seismic event greater than M3.0, and local observation or report, and local report and confirmation of damage Seismic event >M3.5	1. Review seismic and operational data. 2. Initiate shutdown plan. 3. Within 24 hours of the incident, notify the UIC Director of the operating status of the well. 4. Communicate with facility personnel and local authorities to initiate evacuation plans, as necessary. 5. Monitor well pressure, temperature, and annulus pressure to verify well status and determine the cause and extent of any failure; identify and implement appropriate remedial actions (in consultation with the UIC Director). 6. Determine if leaks to ground water or surface water occurred. 7. If USDW contamination is detected, notify the UIC Director within 24 hours of the determination. 8. Report findings to the UIC Director and issue corrective actions.

Table 10-6: Seismicity protocol for seismic events located with an epicenter within the AoR.

10.5 Response Personnel and Equipment

Site personnel, off-site project personnel, and local authorities will be relied upon to implement this ERRP and an emergency contact list will be provided to the UIC Director.

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, Fidelis shall be responsible for its procurement.

10.6 Emergency Communications Plan

Fidelis will communicate to the public about any event that requires an emergency response to ensure that the public understands what happened and whether there are any environmental or safety implications, in consultation with the UIC Director. 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.

Fidelis 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), Fidelis will provide periodic updates on the progress of the response action(s).

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

Emergency situations related to the injection project and described in this EERP will be managed by the Fidelis VP of Operations All media communications with the public will be made through either interview, press releases, website postings, or other.

Individuals assigned the emergency response communications duties should have availability 24-hours a day once an emergency.is declared.

10.7 Plan Review (40 CFR 146.94 (d))

This ERRP shall be reviewed:

- At least once every five-years or as necessary following its approval by the permitting agency.
- Within one-year of an AoR re-evaluation.

- Within six-months 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, Fidelis 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.

10.8 Staff Training and Exercise Procedures

Fidelis will integrate this ERRP into the project-specific standard operating procedures (SOPs) and training program. Periodic training will be provided, not less than annually, to appropriate personnel. The training plan will document that the personnel have been trained and possess the required skills to perform their relevant emergency response activities described in the ERRP.

11.0Appendix 10.A – FMEA Risk Assessment

A detailed Failure, Mode, Effect, Analysis (FMEA) risk assessment has been completed. Each potential risk is assigned a severity, occurrence and detection ranking as defined in **Table 10-7** below. A Risk Priority Number (RPN) is calculated for each risk element as the product of the severity, occurrence, and detection ranking. Identified risks with an RPN of greater than 100 are summarized below in **Table 10-8.**

Ranking	Severity Description	Occurrence Description	Detection Description
10	Hazardous without warning	Very High ≥ 1 in 10	Almost Impossible
9	Hazardous with warning	High ≥ 1 in 20	Very Remote
8	Very High	High ≥ 1 in 50	Remote
7	High	High ≥ 1 in 100	Very Low
6	Moderate	Moderate ≥ 1 in 500	Low
5	Low	Moderate ≥ 1 in 2,000	Moderate
4	Very Low	Moderate ≥ 1 in 10,00	Moderate High
3	Minor	Low ≥ 1 in 100,000	High
2	Very Minor	Low ≥ 1 in 1,000,000	Very High
1	Negligible	Very low, effectively eliminated	Almost Certain

Table 10-7: FMEA risk analysis ranking definition

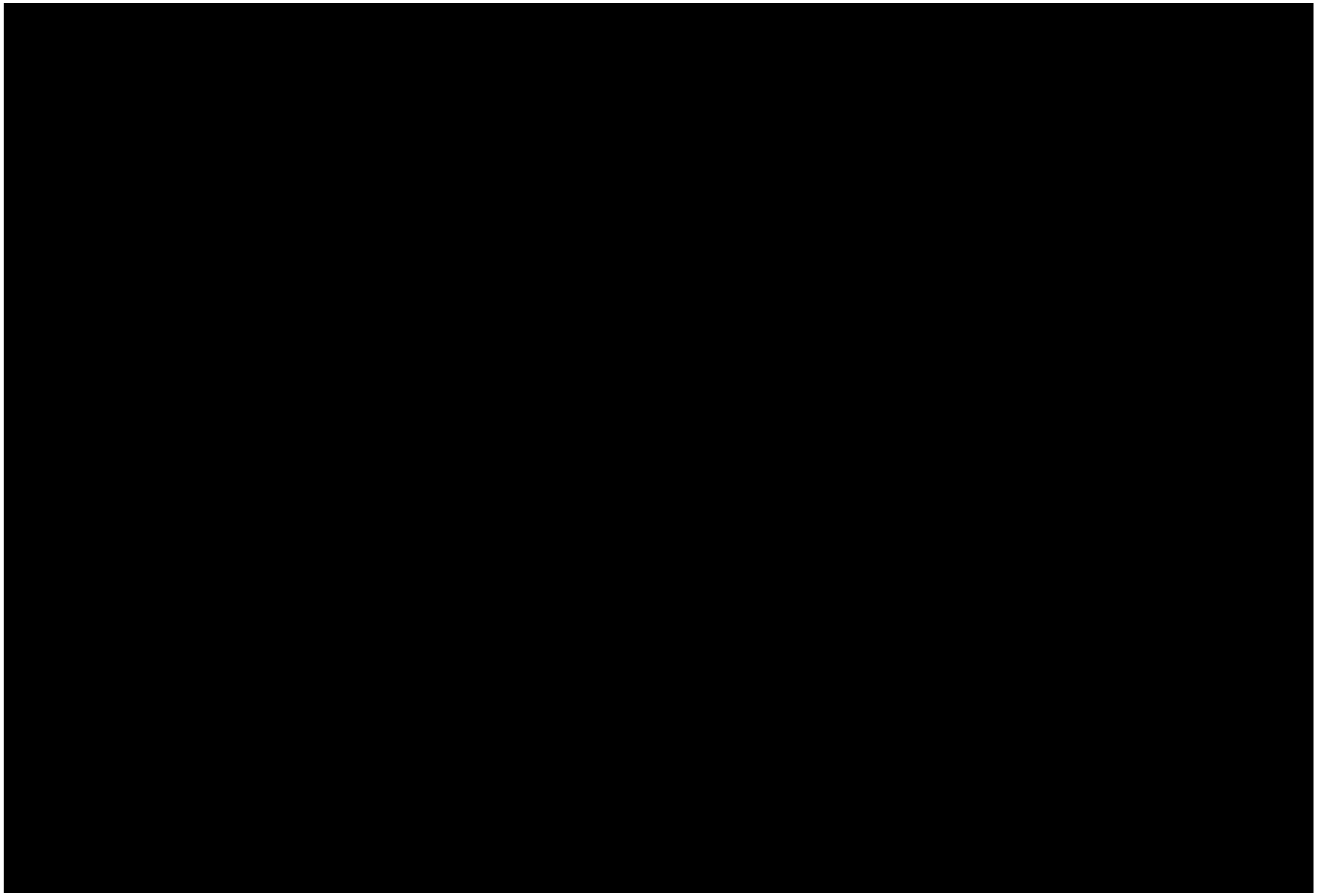

Table 10-8: FMEA risk analysis for Capio Mountaineer Sequestration Project