Plan revision number: 1
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EMERGENCY AND REMEDIAL RESPONSE PLAN
40 CFR 146.94(a)

Wabash CCS Project

INSTRUCTIONS

This template provides an outline and recommendations for the Emergency and Remedial Response Plan.

In this template, examples or suggestions appear in **blue text**. These are provided as general recommendations to assist with site- and project-specific plan development. The recommendations are not required elements of the Class VI Rule. This document does not substitute for those provisions or regulations, nor is it a regulation itself, and it does not impose legally-binding requirements on the EPA, states, or the regulated community.

Please delete the **blue text** and replace the yellow highlighted text before submitting your document. Similarly, please adjust the example tables as necessary (e.g., by adding or removing rows or columns). Appropriate maps, figures, references, etc. should also be included to support the text of the plan.

Remember that, pursuant to 40 CFR 146.94(a), the requirement to maintain and implement an approved Emergency and Remedial Response Plan is directly enforceable regardless of whether the requirement is a condition of the permit. For more information, see the Class VI guidance documents at https://www.epa.gov/uic/class-vi-guidance-documents. It is the responsibility of the owner or operator to maintain records of previous revisions to this plan.

To avoid duplicative reporting, you are encouraged to provide relevant cross-references to other submissions made with the GSDT.

Facility Information

Facility name:	Wabash Carbon Services WVCCS1 and WVCCS2
Facility contact:	Rory Chambers, Vice President Operations 444 West Sandford Ave, West Terre Haute, IN 47885 (812) 281-2810 RChambers@wvresc.com
Well location:	WVCCS#1 Clinton, Vermillion, Indiana 39^0 37’ 27.88’’ N, 87^0 29’ 19.17’’ W WVCCS#2 West Terre Haute, Vigo, Indiana 39º 33’ 3.72” N, 87º 29’ 16.60” W

This Emergency and Remedial Response Plan (ERRP) describes actions that Wabash Carbon Services (WCS) shall 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.

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

1. Initiate shutdown plan for the affected injection well.
2. Take all steps reasonably necessary to identify and characterize any release.
3. Notify the permitting agency (EPA Region 5 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: WCS will immediately cease injection. However, in some circumstances, WCS will, in consultation with the UIC Program Director, determine whether gradual cessation of injection is appropriate and if both wells need to be shut in.

Local Resources and Infrastructure

Sensitive, Confidential, or Privileged Information [redacted]

Infrastructure in the vicinity of the WVCCS1 and WVCCS2 that may be affected as a result of an emergency at the project site include: Wellhead at WVCCS1 and WVCCS2; International Union of Operating Engineers Training Facility; and WCS facilities.

Resources and infrastructure addressed in this plan are shown in Figure 1.

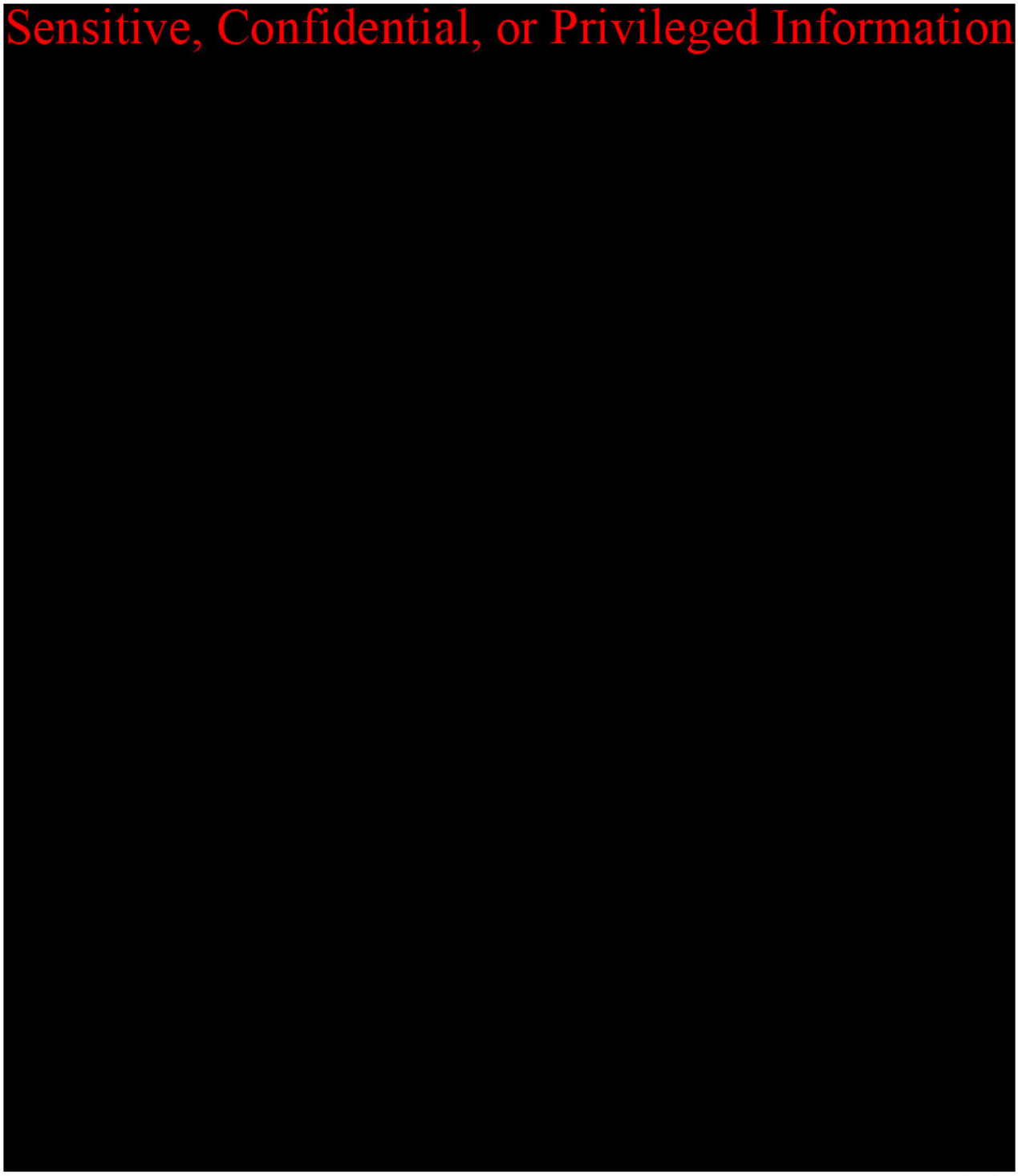

Figure 1 Resources and Infrastructure in AoR

Potential Risk Scenarios

The following events related to the WCCSP that could potentially result in an emergency response:

- Injection or monitoring (verification) well(s) integrity failure
- Injection well monitoring equipment failure (e.g., shut-off valve or pressure gauge, etc.)
- A natural disaster (e.g., earthquake, tornado, lightning strike)
- Fluid (e.g.brine) leakage to a USDW
- CO_2 leakage to USDW or land surface

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.
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.

Emergency Identification and Response Actions

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 identified in Part 2 are detailed below.

Well Integrity Failure

A loss of well integrity either at the injection well and/or verification well may endanger USDWs. It should be noted that a pressure or temperature anomaly that may occur does not mean that in every instance this has led to a loss of well integrity. A potential well integrity loss or permit non-compliance may have occurred if the following events occur:

- Automatic shutdown devices are activated:
    - Wellhead pressure exceeds the specified shutdown pressure specified in the permit.
    - Annulus pressure indicates a pressure communication anomaly or a potential loss of external or internal well containment.
- Mechanical integrity test results identify a potential loss of mechanical integrity.

- Monitoring wells detect injection fluid and/or pressures above the injection zone indicating possible upward fluid flow away from the injection well. (NOTE: Detection of injection fluid and/or pressure above the injection zone might also occur and not be related to a failure of external mechanical integrity of the injection well.)

Response actions:

- Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
- Determine the severity of the event, based on the information available, within 24 hours of notification.
- For a Major or Serious emergency:
    - Initiate shutdown plan.
    - Shut in well (close flow valve).
    - Vent CO_2 from surface facilities located at Wabash Valley Resource (WVR) site.
    - Limit access to wellhead to authorized personnel only.
    - Communicate with WCS personnel, WVR personnel and local authorities to initiate evacuation plans, if necessary.
    - Monitor well pressure, temperature, and annulus pressure to verify integrity loss and perform diagnostics to determine the cause and extent of well integrity loss; identify and implement appropriate remedial actions to restore well integrity (in consultation with the UIC Program Director).
    - If leakage out of the permitted injection zone or impacts on USDWs is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director)
- For a Minor emergency:
    - Conduct assessment and/or diagnostics to determine whether there has been a minor pressure or temperature anomaly or permit non-compliance or actual loss of mechanical integrity.
    - If there has been a loss of mechanical integrity, initiate shutdown plan.
        - Shut in well (close flow valve).
        - Vent CO_2 from surface facilities.
        - Reset automatic shutdown devices.
        - Monitor well pressure, temperature, and annulus pressure and perform diagnostics to verify integrity loss and determine the cause and extent of integrity loss; identify and, if necessary, implement appropriate remedial actions to restore well integrity (in consultation with the UIC Program Director).

- If there has been NO loss of integrity or permit non-compliance
  - Continue injection operation
  - Determine cause of anomalous instrument reading

Injection Well Monitoring Equipment Failure

The failure of monitoring equipment for wellhead pressure, temperature, and/or annulus pressure may indicate a potential problem with the injection well that may endanger USDWs.

Response actions:

- Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
- Determine the severity of the event, based on the information available, within 24 hours of notification.
- Project management will make an initial assessment of the situation and determine which other project personnel to notify.
- For a Major or Serious emergency:
  - Initiate shutdown plan.
  - Shut in well (close flow valve).
  - Vent CO_2 from surface facilities.
  - Limit access to wellhead to authorized personnel only.
  - Communicate with WCS personnel, WVR personnel and local authorities to initiate evacuation plans, as necessary.
  - Monitor well pressure, temperature, and annulus pressure (manually if necessary) to determine the cause and extent of failure.
  - Identify and, if necessary, implement appropriate remedial actions (in consultation with the UIC Program Director).
- For a Minor emergency:
  - Conduct assessment to determine whether there has been a potential or actual loss of mechanical integrity.
  - If there has been an actual loss of mechanical integrity (and not a pressure and/or temperature monitoring anomaly or a permit non-compliance issue such as a plant upset), initiate shutdown plan.
  - Shut in well (close flow valve).
  - Vent CO_2 from surface facilities.
  - Reset or repair automatic shutdown devices.

- Monitor well pressure, temperature, and annulus pressure (manually if necessary) to determine the cause and extent of potential or actual loss of integrity.

- Identify and, if necessary, implement appropriate remedial actions to restore well and monitoring equipment integrity (in consultation with the UIC Program Director).

Potential Brine or CO_2 Leakage to USDW

Elevated concentrations of indicator parameter(s) in groundwater sample(s) or other evidence of fluid (brine) or CO_2 leakage into a USDW.

Response actions:

- Immediately notify the WCS Project Manager or designee.
- Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
- The Project Manager will make an initial assessment of the situation and determine which other project personnel to notify.
- Project contacts will determine the severity of the event, based on the information available, within 24 hours of notification.
- For all emergencies (Major, Serious, or Minor):
  - Initiate shutdown plan.
  - Vent CO_2 from surface facilities.
    - Collect a confirmation sample(s) of groundwater and analyze for indicator parameters.
  - If the presence of indicator parameters is confirmed, 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.
  - Arrange for an alternate potable water supply, if the USDW was being utilized and has been caused to exceed drinking water standards.
  - Proceed with efforts to remediate 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).
  - Continue groundwater remediation and monitoring on a frequent basis (frequency to be determined by WCS and the UIC Program Director) until unacceptable adverse USDW impact has been fully addressed.

Natural Disaster

Well problems (integrity loss, leakage, or malfunction) may arise as a result 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.

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

Response actions:

- Immediately notify WCS Project Manager or Designee.
- Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c). The Plant Manager or designee will make an initial assessment of the situation and determine which other project personnel to notify.
- Project contacts will determine the severity of the event, based on the information available, within 24 hours of notification.
- For a Major or Serious emergency:
    - Initiate shutdown plan.
    - Shut in well (close flow valve).
    - Vent CO_2 from surface facilities.
    - Limit access to wellhead to authorized personnel only.
    - Communicate with WCS personnel, WVR personnel and local authorities to initiate evacuation plans, as necessary.
    - Monitor well pressure, temperature, and annulus pressure (manually if necessary) to determine the cause and extent of failure.
    - Determine if any leaks to ground water or surface water occurred.
    - If contamination or endangerment is detected, identify and implement appropriate remedial actions (in consultation with the UIC Program Director).
- For a Minor emergency:
    - Conduct assessment to determine whether there has been a loss of mechanical integrity.
    - If there has been NO loss of mechanical integrity reset automatic shutdown devices
    - If there has been a loss of mechanical integrity, initiate shutdown plan.
    - Shut in well (close flow valve).
    - Vent CO_2 from surface facilities.

- Limit access to wellhead to authorized personnel only.

- Monitor well pressure, temperature, and annulus pressure to verify integrity loss and determine the cause and extent of failure; identify and, if necessary, implement appropriate remedial actions (in consultation with the UIC Program Director).

Induced Seismic Event

Based on the project operating conditions, it is highly unlikely that injection operations would ever induce a seismic event. WCS is utilizing the Potosi dolomite as the injection zone due to its high porosity and permeability. The high permeability of the formation results in a very low pressure increase within the formation, resulting in low stresses exerted on the surrounding rock. In addition, the Potosi dolomite is located above the Eau Claire Shale, a recognized and demonstrated seal formation. The presence of the underlying Eau Claire formation restricts the downward movement of the pressure front toward the Pre-Cambrian basement which is the historic source of seismic activity in the area. Sensitive, Confidential, or Privileged Information [redacted] Therefore, this portion of the response plan is developed for any seismic event with an epicenter within a 5-mile radius of the injection well.

To monitor the area for seismic incidents, WCS will rely upon the established USGS seismic monitoring network. The USGS network provides real time monitoring of seismic activity across the United States. The WCS injection site sits between two USGS seismic monitoring stations. Sensitive, Confidential, or Privileged Information [redacted]

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. 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.

The seismic monitoring system structure is presented in *Table 2*. The table corresponds each level of operating state with the threshold conditions and operational response actions.

Table 2. Seismic monitoring system, for seismic events [1]

Operating State	Threshold Condition	Response Action
Green	Seismic events less than or equal to M1.5 [2]	1. Continue normal operation within permitted levels.
Yellow	Five (5) or more seismic events within a 30 day period having a magnitude greater than M1.5 [2] but less than or equal to M2.0 [2]	1. Continue normal operation within permitted levels. 2. Within 24 hours of the incident (fifth seismic event), notify the UIC Program Director of the operating status of the well.
Orange	Seismic event greater than M1.5 [2;] and local observation or felt report [(3)] Seismic event greater than M2.0 [2] and no felt report	1. Continue normal operation within permitted levels. 2. Within 24 hours of the incident, notify the UIC Program Director. 3. Review seismic and operational data. 4. Report findings to the UIC Program Director and issue corrective actions [4].
Magenta	Seismic event greater than M2.0 [2]; and local observation or report [3]	1. Initiate injection rate reduction plan. 2. Vent CO_2 from Surface Facilities 3. Within 24 hours of the incident, notify the UIC Program Director. 4. Limit access to injection wellhead to authorized personnel only. 5. Communicate with facility personnel and local authorities to initiate evacuation plans, as necessary. 6. 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 Program Director). 7. Determine if leaks to ground water or surface water occurred. 8. If USDW contamination is detected: a. Notify the UIC Program Director within 24 hours of the determination. b. Initiate Shutdown Plan c. Shut in well (close flow valve) d. Vent CO_2 from surface facilities e. Identify and implement appropriate remedial actions (in consultation with UIC Program Director 9. Review seismic and operational data. 10. Report findings to the UIC Program Director and issue corrective actions.[4]

[1] Seismic events < M1.0 with an epicenter within an 8 mile radius of the injection well.

[2] Determined by USGS seismic monitoring stations or reported by the USGS National Earthquake Information Center using the national seismic network.

[3] Confirmed by local reports of felt ground motion or reported on the USGS "Did You Feel It?" reporting system.

[4] Within 25 business days (five weeks) of change in operating state

Operating State	Threshold Condition	Response Action
Red	Seismic event greater than M2.0 [2], and local observation or report [3], and local report and confirmation of damage [5] Seismic event >M3.5 [2]	1. Initiate shutdown plan. 2. Shut in well (close flow valve) 3. Vent CO_2 from Surface Facilities 4. Within 24 hours of the incident, notify the UIC Program Director of the operating status of the well. 5. Limit access to injection wellhead to authorized personnel only 6. Communicate with facility personnel and local authorities to initiate evacuation plans, as necessary. 7. 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 Program Director). 8. Determine if leaks to ground water or surface water occurred. 9. If USDW contamination is detected: a. Notify the UIC Program Director within 24 hours of the determination. b. Identify and implement appropriate remedial actions (in consultation with UIC Program Director) 10. Review seismic and operational data. 11. Report findings to the UIC Program Director and issue corrective actions [4].

[5] Onset of damage is defined as cosmetic damage to structures – such as bricks dislodged from chimneys and parapet walls, broken windows, and fallen objects from walls, shelves, and cabinets.

Response Personnel and Equipment

Site personnel, project personnel, and local authorities will be relied upon to implement this ERRP. The injection wells are located in Vermillion and Vigo Counties outside of any city limits. Therefore, County emergency responders (as well as State agencies) will need to be notified in the event of an emergency.

Site personnel to be notified (not listed in order of notification):

1. Project Engineer(s)
2. Project Safety Manager(s)
3. Environmental Manager(s)
4. Project Manager
5. Project Operations Manager
6. Carbon Capture Plant Manager
7. Carbon Capture Plant Operations Supervisor

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

Table 3. Contact information for key local, state, and other authorities.

Agency	**Phone Number**
Vigo County Sheriff	(812) 462-3226
Vermillion County Sheriff	(765) 492-3838
Indiana State Police	(317) 232-8248
New Goshen Volunteer Fire Department	(812) 535-3600
Indiana Department of Homeland Security	(317)232-2222
Vigo County Emergency Management	(812) 462-3217
Vermillion County Emergency Management	(765) 832-5500
Environmental services contractor	TBD
UIC Program Director (US EPA Region V)	(312) 886-2446
EPA National Response Center (24 hours)	800-424-8802
Indiana State Water and Geological Survey	(812) 855-7636

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, WCS shall be responsible for its procurement.

Emergency Communications Plan

WCS 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. 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.

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

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

Plan Review

This ERRP shall be reviewed:

- At least once every five (5) years following its approval by the permitting agency
- Within one (1) year of an area of review (AOR) re-evaluation
- Within a prescribe period (to be determined by the permitting agency) 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, WCS 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 (6) months following an event that initiates the ERRP review procedure for incorporation into the existing permit/s.

Staff Training and Exercise Procedures

WCS will integrate the ERRP into the plant specific standard operating procedures and training program.

Implementation of Environmental, Health and Safety Training

Periodic training will be provided, not less than annually, to well operators, project safety and environmental personnel, the project manager, Carbon Capture Plant operations supervisor, and corporate communications. The training plan will document that the above listed personnel have

been trained and possess the required skills to perform their relevant emergency response activities described in the ERRP.