EMERGENCY AND REMEDIAL RESPONSE PLAN SUMMARY
40 CFR 146.94(a)

YAMS CO_2 Sequestration Project

1.0 Facility Information 1
2.0 Overall Strategy and Approach for Emergency and Remedial Response 1

1.0 Facility Information

Facility name: YAMS CO_2 Sequestration Project
YAMS CCS 1 Well

Facility contact: Kelly Watson, Project Manager
5 Greenway Plaza Houston, TX 77046
713-552-8613 kelly_watson@oxy.com

Well location: [redacted], Louisiana

The Emergency and Remedial Response Plan (ERRP) describes actions Oxy Low Carbon Ventures, LLC, 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 Oxy Low Carbon Ventures, LLC, obtains evidence that the injected CO_2 stream and/or associated pressure front may cause an endangerment to a USDW, Oxy Low Carbon Ventures, LLC, must 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 (UIC Program Director) of the emergency event within 24 hours.
4. Implement applicable portions of the approved ERRP.

2.0 Overall Strategy and Approach for Emergency and Remedial Response

Resources in the vicinity of the YAMS CO_2 Sequestration Project that may be affected as a result of an emergency event at the project site include USDWs, surface rivers and riverines, and nontidal, emergent wetlands. The Area of Review and Corrective Action Plan document addresses the USDWs within the project rea.

Infrastructure in the vicinity of the YAMS CO_2 Sequestration Project that that may be affected as a result of an emergency at the project site include local surface operations and an unincorporated community adjacent to the AoR.

The events related to the YAMS CO_2 Sequestrations Project that could potentially result in an emergency response are include over-pressured gas flow, movement of brine or CO2 outside the defined AoR, loss of mechanical integrity, monitoring equipment failure, seismic event, or natural disaster. Response actions will depend on the severity of the event(s) triggering an emergency response and are described in detail in the project Emergency and Remedial Response Plan document of the permit.

Monitoring, control, and routine maintenance of the injection operations will be the responsibility of the Injection Operations Staff. Site personnel, project personnel, and local authorities will be relied upon to implement the ERRP. A site-specific emergency contact list will be developed and maintained during the life of the project. 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, Oxy Low Carbon Ventures, LLC, shall be responsible for its procurement.

Oxy Low Carbon Ventures, LLC, 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.

POST-INJECTION SITE CARE AND SITE CLOSURE PLAN SUMMARY
40 CFR 146.93(a)

YAMS CO_2 Sequestration Project

1.0 Facility Information 1

2.0 Overall Strategy and Approach for Post-Injection Site Care and Closure 1

1.0 Facility Information

Facility name: YAMS CO_2 Sequestration Project
YAMS CCS 1 Well

Facility contact: Kelly Watson, Project Manager
5 Greenway Plaza Houston, TX 77046
713-552-8613 kelly_watson@oxy.com

Well location: [redacted], Louisiana

This Post-Injection Site Care and Site Closure (PISC) plan describes the activities that Oxy Low Carbon Ventures, LLC, will perform to meet the requirements of 40 CFR 146.93. Oxy Low Carbon Ventures, LLC, will monitor ground water quality and track the position of the carbon dioxide plume and pressure until site closure. Oxy Low Carbon Ventures, LLC, may not cease post-injection monitoring until a demonstration of non-endangerment of USDWs has been approved by the UIC Program Director pursuant to 40 CFR 146.93(b)(3). Following approval for site closure, Oxy Low Carbon Ventures, LLC, will plug all monitoring wells, restore the site to its original condition, and submit a site closure report and associated documentation.

2.0 Overall Strategy and Approach for Post-Injection Site Care and Closure

The reservoir simulation indicates that, after injection ceases, the pressure front begins to dissipate, and the CO_2 plume remains within the injection zone and continues to expand.

After the injection ceases, the project will plug and abandon the injector wells according to the plugging procedure proposed in the Plugging Plan document. Additional monitoring wells will be drilled as proposed in the phased approach of the monitoring plan provided in the Testing and Monitoring Plan document.

Planned groundwater quality monitoring and plume and pressure front tracking during the post-injection phase will meet the requirements of 40 CFR 146.93(b)(1). The results of all post-injection phase testing and monitoring will be submitted annually, within 60 days of the anniversary of the date that injection ceases. The post-injection monitoring program will focus on the tracking of the projected CO_2 plume migration.

During the PISC period, the monitoring reports will be prepared annually and submitted to the EPA Region 6 UIC Branch Office. These reports will summarize methods and results of ground water quality monitoring, CO_2 storage zone pressure tracking, and indirect geophysical monitoring for CO_2 plume tracking.

The PISC and Site Closure Plan will be reviewed every 5 years during the PISC period. Results of the plan review will be included in the PISC monitoring reports. The operational and monitoring results will be reviewed for adequacy in relation to the objectives of the PISC. The monitoring locations, methods, and schedule will be analyzed in relation to the size of the CO_2 storage zone, pressure front, and protection of USDWs. In case of changes to the PISC plan, a modified plan will be submitted to the EPA Region 6 UIC Branch Office at least 30 days before the planned initiation of the changes.

Prior to approval of the end of the post-injection phase, Oxy Low Carbon Ventures, LLC, will submit a demonstration of non-endangerment of USDWs to the UIC Program Director, per 40 CFR 146.93(b)(2) and (3).

Oxy Low Carbon Ventures, LLC, will conduct site closure activities to meet the requirements of 40 CFR 146.93(e) as described below. Oxy Low Carbon Ventures, LLC, will submit a final Site Closure Plan and notify the permitting agency at least 120 days prior of its intent to close the site. Once the permitting agency has approved closure of the site, Oxy Low Carbon Ventures, LLC, will plug the monitoring wells and submit a site closure report to EPA. The activities, as described below, represent the planned activities based on information provided to EPA. The actual site closure plan may employ different methods and procedures. A final Site Closure Plan will be submitted to the UIC Program Director for approval.

Upon conclusion of the post-injection site care period, all monitoring wells will be plugged and capped below grade in accordance with the approved Plugging and Abandonment Plans. Before the wells are plugged, the internal and external integrity of the wells will be confirmed. The results of this logging and testing will be reviewed and approved by the appropriate regulatory agencies prior to plugging the wells.

After the completion of the plugging activities, a plugging report will be submitted to the UIC Program Director describing the methods used and tests performed on the well during plugging. This report will be submitted to the UIC Program Director within 60 days of completing the plugging activities.

At the end of the PISC phase, Oxy Low Carbon Ventures, LLC, will ensure the site is reclaimed and returned to predevelopment condition to meet the requirements of 40 CFR 146.93(e).

INJECTION WELL PLUGGING PLAN SUMMARY
40 CFR 146.92(b)

YAMS CO_2 Sequestration Project

1.0 Facility Information 1
2.0 Overall Strategy and Approach for Injection Well Plugging and Abandonment 1

1.0 Facility Information

Facility name: YAMS CO_2 Sequestration Project
YAMS CCS 1 Well

Facility contact: Kelly Watson, Project Manager
5 Greenway Plaza Houston, TX 77046
713-552-8613 kelly_watson@oxy.com

Well location: [redacted], Louisiana

Oxy Low Carbon Ventures, LLC, will conduct injection well plugging and abandonment according to the procedures below.

Upon the end of life for YAMS CCS 1, this injection well will be plugged and abandoned relevant to the requirements of Environmental Protection Agency (EPA) document 40 CFR Subpart H – Criteria and Standards Applicable to Class VI Wells. The plugging procedure and materials will be designed to prevent any unwanted fluid movement, resist the corrosive aspects of carbon dioxide (CO_2) with water mixtures, and protect any underground sources of drinking water (USDWs).

2.0 Overall Strategy and Approach for Injection Well Plugging and Abandonment

After injection has ceased, the well will be flushed and pressure measurements taken. A log to ensure integrity inside and outside of the casing will be run prior to plugging. Any injection tubing and packer will be removed, and the well will be plugged.

In compliance with 40 CFR 146.92(c), Oxy Low Carbon Ventures, LLC, will notify the regulatory agency at least 60 days before plugging the well and provide updated Injection Well Plugging Plan, if applicable.

The tools and techniques proposed to plug and abandon the injection well are included in the project Injection Well Plugging Plan document of the permit.

Class VI UIC Project Plan Submissions

This submission is for:

Project ID: R06-LA-0004

Project Name: YAMS CO2 Sequestration Project

Current Project Phase: Pre-Injection Prior to Construction

Testing and Monitoring

Are You Making a Testing and Monitoring Plan Submission at this Time: Yes

Reason for Project Plan Submission: Permit Application Submission

Project Plan Upload

Attach the Testing and Monitoring Plan: https://epa.velo.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-LA-0004/Phase1-PreConstruction/ProjPlan-07-20-2021-1057/TM_YAMS_CCS_1g.pdf

Appendices and Supporting Materials Upload

Injection Well Plugging

Are You Making an Injection Well Plugging Plan Submission at this Time: Yes

Reason for Project Plan Submission: Permit Application Submission

Project Plan Upload

Attach the Injection Well Plugging Plan: https://epa.velo.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-LA-0004/Phase1-PreConstruction/ProjPlan-07-20-2021-1057/PLG_YAMS_CCS_1g.pdf

Appendices and Supporting Materials Upload

PISC and Site Closure

Are You Making a Post-Injection Site Care and Site Closure Plan Submission at this Time: Yes

Reason for Project Plan Submission: Permit Application Submission

Project Plan Upload

Attach the Post-Injection Site Care and Site Closure Plan: https://epa.velo.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-LA-0004/Phase1-PreConstruction/ProjPlan-07-20-2021-1057/PISC_SC_YAMS_CCS_1g.pdf

Appendices and Supporting Materials Upload

Emergency and Remedial Response

Are You Making an Emergency and Remedial Response Plan Submission at this Time: Yes

Reason for Project Plan Submission: Permit Application Submission

Project Plan Upload

Attach the Emergency and Remedial Response Plan: https://epa.velo.pnnl.gov/alfresco/service/velo/getFile/no_wiki/shared/Submissions/R06-LA-0004/Phase1-PreConstruction/ProjPlan-07-20-2021-1057/ERR_YAMS_CCS_1g.pdf

Appendices and Supporting Materials Upload

Complete Submission

Authorized submission made by: Kelly Watson

For confirmation a read-only copy of your submission will be emailed to: Kelly_Watson@oxy.com

TESTING AND MONITORING PLAN OVERVIEW
40 CFR 146.90

YAMS CO_2 Sequestration Project

1.0 Facility Information 1
2.0 Overall Strategy and Approach for Testing and Monitoring 1

1.0 Facility Information

Facility name: YAMS CO_2 Sequestration Project
YAMS CCS 1 Well

Facility contact: Kelly Watson, Project Manager
5 Greenway Plaza Houston, TX 77046
713-552-8613 kelly_watson@oxy.com

Well location: [redacted], Louisiana

This Testing and Monitoring Plan describes how Oxy Low Carbon Ventures, LLC, will monitor the YAMS CO_2 Sequestration Project site pursuant to 40 CFR 146.90. In addition to demonstrating that the well is operating as planned, the carbon dioxide plume and pressure front are moving as predicted, and that there is no endangerment to USDWs, the monitoring data will be used to validate and adjust the geological models used to predict the distribution of the CO_2 within the storage zone to support AoR reevaluations and a non-endangerment demonstration.

Results of the testing and monitoring activities described below may trigger action according to the Emergency and Remedial Response Plan.

2.0 Overall Strategy and Approach for Testing and Monitoring

The monitoring network is designed to detect unforeseen CO_2 and/or brine leakage out of the injection zone that could endanger the USDW, migrate to a different stratus, or create a risk for the people or environment. The monitoring program is tailored to track the migration of the CO_2 plume and development of the pressure front to validate the simulation models and to be able to delineate the AoR effectively. There are several components that are integrated into the master plan for monitoring, which are classified in the following categories:

1. Carbon Dioxide Stream Analysis
2. Continuous Recording of Operational Parameters
3. Corrosion Monitoring and Leak Detection

4. Above Confining Zone Monitoring
5. External Mechanical Integrity Testing
6. Pressure Fall-Off Testing
7. Carbon Dioxide Plume and Pressure Front Tracking

The tools and techniques proposed to monitor the surface and downhole operating conditions of the wells along with the quality of the CO_2 being injected are included in the project Testing and Monitoring Plan document of the permit.