

State of Colorado
Energy & Carbon Management Commission

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Report taken by:
Taylor Robinson

Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by ECOM is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27. This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATION

| | | |
|--|--------------------------------------|---|
| Name of Operator: <u>KERR MCGEE OIL & GAS ONSHORE LP</u> | Operator No: <u>47120</u> | Phone Numbers Phone: <u>(970) 336-3500</u> Mobile: <u>()</u> |
| Address: <u>P O BOX 173779</u> | | |
| City: <u>DENVER</u> | State: <u>CO</u> | Zip: <u>80217-3779</u> |
| Contact Person: <u>Phillip Hamlin</u> | Email: <u>Phillip_Hamlin@oxy.com</u> | |

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 4013 Initial Form 27 Document #: 1881343

PURPOSE INFORMATION

- Rule 913.c.(1): Pit or Cuttings Trench closure.
- Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- Rule 913.g: Changes of Operator.
- Rule 915.b: Request to leave elevated inorganics in situ.
- Other: _____

SITE INFORMATION

No Multiple Facilities

| | | | |
|--|----------------------------|---|---|
| Facility Type: <u>LOCATION</u> | Facility ID: <u>317962</u> | API #: _____ | County Name: <u>WELD</u> |
| Facility Name: <u>SARCHET LAURA A GAS UNIT-63N66W 21SWNE</u> | | Latitude: <u>40.213190</u> | Longitude: <u>-104.778760</u> |
| | | ** correct Lat/Long if needed: Latitude: <u>40.212829</u> | Longitude: <u>-104.778799</u> |
| QtrQtr: <u>SWNE</u> | Sec: <u>21</u> | Twp: <u>3N</u> | Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u> |

SITE CONDITIONS

General soil type - USCS Classifications SW Most Sensitive Adjacent Land Use Agriculture
Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? Yes

Is groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Excavation groundwater approximately 15 feet (ft) below ground surface (bgs).

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- E&P Waste Other E&P Waste Non-E&P Waste
- Produced Water Workover Fluids
- Oil Tank Bottoms
- Condensate Pigging Waste
- Drilling Fluids Rig Wash
- Drill Cuttings Spent Filters
- Pit Bottoms
- Other (as described by EPA) _____

DESCRIPTION OF IMPACT

| Impacted? | Impacted Media | Extent of Impact | How Determined |
|-----------|----------------|-----------------------------------|---|
| Yes | GROUNDWATER | See Attached Data | Groundwater Samples/Lab Analysis |
| Yes | SOILS | 90' N-S x 50' E-W x 23' bgs (max) | 2007/2008 Excavations - Soil Samples/Lab Analysis |

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

In May 2007, soil with historical petroleum hydrocarbon impacts was encountered while tying new wells into the Laura Sarchet GU 1 tank battery. The wells were shut in and petroleum hydrocarbon impacted soil was excavated.

In November 2008, an operator left the production tank drain valve open to the water sump and left the site. Approximately 80 barrels of crude oil were released within the steel tank battery berm before the night operator arrived and closed the drain valve. A vacuum truck was used to recover 35 barrels of crude oil from inside the berm and the petroleum hydrocarbon impacted soil was excavated. The Site Map depicting the excavation area is attached as Figure 1.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

On May 9 and 10, 2007, five soil samples were collected from the 2007 excavation sidewalls for laboratory analysis of total petroleum hydrocarbons (TPH). Laboratory analytical results indicated that the TPH concentrations were in full compliance with the Energy and Carbon Management Commission (ECMC), formerly known as Colorado Oil and Gas Conservation Commission (COGCC), sensitive area allowable level of 1,000 milligrams per kilogram (mg/kg) at the lateral extent of the excavation. The soil samples were not analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) as the samples were collected prior to the April 1, 2009, ECMC rule changes.

On December 8 and 10, 2008, eleven soil samples were collected from the 2008 excavation for laboratory analysis of TPH. Laboratory analytical results indicated that TPH concentrations were in full compliance with the ECMC sensitive area allowable level at the lateral extent of the excavation.

Proposed Groundwater Sampling

Will groundwater samples be collected as part of this investigation? (Number, analyses, and locations of samples):

On May 9, 2007, groundwater sample GW01 was collected from the 2007 excavation for laboratory analysis of BTEX. Laboratory analytical results indicated that sample GW01 exceeded the ECMC Table 910-1 allowable levels for benzene, toluene, and total xylenes at concentrations of 510 micrograms per liter (µg/L), 3,600 µg/L, and 11,000 µg/L, respectively.

On December 8, 2008, groundwater sample GW01 was collected from the 2008 excavation for BTEX analysis. Laboratory analytical results indicated that sample GW01 exceeded the ECMC Table 910-1 allowable levels for benzene, toluene, and total xylenes at concentrations of 6,100 µg/L, 12,000 µg/L, and 9,200 µg/L, respectively. The 2007 and 2008 excavation groundwater sample locations are depicted on Figure 1. The groundwater analytical results are summarized on Table 1.

Quarterly groundwater monitoring has been conducted at the site since August 2007.

Proposed Surface Water Sampling

Will surface water samples be collected as part of this investigation? (Number, analyses, and locations of samples):

Additional Investigative Actions

Additional alternative investigative actions described in attached Site Investigation Plan (summary):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 16
Number of soil samples exceeding 915-1 3
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 4000

NA / ND

-- Highest concentration of TPH (mg/kg) 7200
NA Highest concentration of SAR
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 12

Groundwater

Number of groundwater samples collected 1132
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 15
Number of groundwater monitoring wells installed 35
Number of groundwater samples exceeding 915-1 595

-- Highest concentration of Benzene (µg/l) 25000
-- Highest concentration of Toluene (µg/l) 12000
-- Highest concentration of Ethylbenzene (µg/l) 1100
-- Highest concentration of Xylene (µg/l) 15000
NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected
 Number of surface water samples exceeding 915-1
If surface water is impacted, other agency notification may be required.

OTHER INVESTIGATION INFORMATION

Were impacts to adjacent property or offsite impacts identified?

Groundwater impacts were detected in the agricultural field northeast of the tank battery.

Were background samples collected as part of this site investigation?

Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) Volume of liquid waste (barrels)

Is further site investigation required?

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? No

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Approximately 363 cubic yards of impacted soil were removed from the 2007 excavation and approximately 1,650 cubic yards of impacted soil were removed from the 2008 excavation. The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling. The impacted soil was excavated into the capillary and phreatic zones to address potential hydrocarbon impacts that may have been present below the groundwater table due to past seasonal fluctuations. Approximately 40 barrels of petroleum hydrocarbon impacted groundwater were removed from the 2008 excavation and transported to a licensed injection facility for disposal. The general site layout and the excavation footprint are depicted on the Site Map provided as Figure 1.

REMEDICATION SUMMARY

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

Prior to backfilling the 2007 excavation, five gallons of MicroBlaze®, a concentrated solution of facultative microbes, nutrients, and surfactants designed to bioremediate petroleum hydrocarbons, were applied to the groundwater in the excavation.

The groundwater monitoring data for this site was evaluated for general trends, plume stability, and whether the groundwater impacts are being reduced by natural attenuation processes. Based on the available data going back to 2007, petroleum hydrocarbon impacts have significantly reduced in the groundwater monitoring wells downgradient of the release location. At MW03, benzene concentrations have reduced from a historical high concentration of 3,700 ug/L (January 2013) to a current concentration of 200 ug/L (July 2024). At MW08, benzene concentrations have reduced from a historical high concentration of 14,000 ug/L (January 2013) to a current concentration of 195 ug/L (July 2024). At MW09, benzene concentrations have reduced from a historical high concentration of 6,700 ug/L (January 2013) to a current concentration of 184 ug/L (July 2024). At MW12, free product was no longer observed since July 2013 and benzene concentrations have reduced from a historical high concentration of 15,000 ug/L (April 2012) to a current concentration of 196 ug/L (July 2024).

The operator plans to collect general groundwater quality parameters such as dissolved oxygen (DO) and oxidation reduction potential (ORP) at select monitoring wells during future groundwater monitoring events to further evaluate evidence of microbial activity. Additional data from the seasonal monitoring wells will continue to be used to demonstrate plume stability.

Soil Remediation Summary

| | |
|---|---|
| <input type="checkbox"/> In Situ | <input checked="" type="checkbox"/> Ex Situ |
| _____ Bioremediation (or enhanced bioremediation) | Yes Excavate and offsite disposal |
| _____ Chemical oxidation | _____ If Yes: Estimated Volume (Cubic Yards) _____ 2013 |
| _____ Air sparge / Soil vapor extraction | Name of Licensed Disposal Facility or ECMC Facility ID # _____ 149007 |
| _____ Natural Attenuation | No Excavate and onsite remediation |
| _____ Other _____ | _____ Land Treatment |
| | _____ Bioremediation (or enhanced bioremediation) |
| | _____ Chemical oxidation |
| | _____ Other _____ |

Groundwater Remediation Summary

Yes _____ Bioremediation (or enhanced bioremediation)

No _____ Chemical oxidation

No _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

Yes _____ Other Groundwater Removal and MicroBlaze® Application _____

GROUNDWATER MONITORING

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

Groundwater monitoring wells MW01R through MW04 and MW07 through MW16 and temporary monitoring wells TMW01, TMW02, TMW03, TMW05, and TMW09 through TMW17 are sampled on a quarterly basis for the full list of analyses for groundwater in Table 915-1. The temporary monitoring wells are abandoned seasonally for the summer harvest per the landowner's request. Cross-gradient and compliant groundwater monitoring well MW14 was established as a representative background sample for calculating the inorganic parameters in Table 915-1. Kerr-McGee will continue to evaluate POC for Table 915-1 on a quarterly basis based on the site-specific local background concentrations. The monitoring well locations are depicted on Figure 1. The Groundwater Elevation Contour Map generated using the July 2024 gauging data is provided as Figure 2. The groundwater analytical results are summarized in Table 1, and the laboratory analytical report for the July 2024 groundwater monitoring event is attached.

Groundwater monitoring will continue on a quarterly basis until a No Further Action status request is warranted.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

Quarterly Semi-Annually Annually Other

Request Alternative Reporting Schedule:

Semi-Annually Annually Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other _____

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

KMOG has sufficient insurance and bonding to fully address the anticipated costs of Remediation, including the remaining estimated costs for this project. KMOG currently has over 40 million in bonds with the Colorado Oil and Gas Conservation Commission. The cost for remediation is a preliminary estimate only, costs may change upwards or downward based on site-specific information. KMOG makes no representation or guarantees as to the accuracy of the preliminary estimate.

Operator anticipates the remaining cost for this project to be: \$ 150000 _____

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? Yes _____

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

The petroleum hydrocarbon impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling.

Volume of E&P Waste (solid) in cubic yards _____ 2013

E&P waste (solid) description Petroleum hydrocarbon impacted soil

ECMC Disposal Facility ID #, if applicable: _____ 149007

Non-ECMC Disposal Facility: _____

Volume of E&P Waste (liquid) in barrels _____ 40

E&P waste (liquid) description Petroleum hydrocarbon impacted groundwater

ECMC Disposal Facility ID #, if applicable: _____ 159255

Non-ECMC Disposal Facility: _____

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No _____

If YES:

Compliant with Rule 913.h.(1).

Compliant with Rule 913.h.(2).

Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards? No _____

Does the previous reply indicate consideration of background concentrations? _____

Does Groundwater meet Table 915-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

RECLAMATION PLAN

RECLAMATION PLANNING

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing.

The site was restored to its pre-release grade. The Kerr-McGee production facility remains at the site.

Is the described reclamation complete? No

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

Interim

Final

Did the Surface Owner provide the seed mix? _____

If YES, does the seed mix comply with local soil conservation district recommendations? _____

Did the local soil conservation district provide the seed mix? _____

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. _____

Proposed date of completion of Reclamation. _____

IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

PRIOR DATES

Date of Surface Owner notification/consultation, if required. _____

Actual Spill or Release date, or date of discovery. 05/07/2007

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/09/2007

Proposed site investigation commencement. 05/07/2007

Proposed completion of site investigation. 10/28/2016

REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/07/2007

Proposed date of completion of Remediation. 10/20/2027

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

OPERATOR COMMENT

| |
|--|
| |
|--|

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Phillip Hamlin

Title: Senior Environmental Rep

Submit Date: 08/16/2024

Email: Phillip_Hamlin@oxy.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Taylor Robinson

Date: 10/03/2024

Remediation Project Number: 4013

COA Type**Description**

| | |
|-------|--|
| | |
| 0 COA | |

ATTACHMENT LIST

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

Att Doc Num**Name**

| | |
|-----------|--|
| 403866649 | INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL) |
| 403866656 | IMPLEMENTATION SCHEDULE |
| 403866657 | ANALYTICAL RESULTS |
| 403868893 | ANALYTICAL RESULTS |
| 403877258 | SITE MAP |
| 403892567 | GROUND WATER ELEVATION MAP |
| 403945204 | FORM 27-SUPPLEMENTAL-SUBMITTED |

Total Attach: 7 Files

General Comments**User Group****Comment****Comment Date**

| | | |
|--|--|---------------------|
| | | Stamp Upon Approval |
|--|--|---------------------|

Total: 0 comment(s)