

State of Colorado
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203
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12/28/2023

Report taken by:

Kari Brown

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 ECMC 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: KERR MCGEE OIL & GAS ONSHORE LP | Operator No: 47120 | Phone Numbers |
| Address: P O BOX 173779 | | Phone: (970) 336-3500 |
| City: DENVER | State: CO | Zip: 80217-3779 |
| Contact Person: Gregory Hamilton | Email: Gregory_Hamilton@oxy.com | Mobile: (970) 515-1698 |

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 22660 Initial Form 27 Document #: 402980103

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

Yes Multiple Facilities

| | | | |
|---------------------------------------------------|---------------------|------------------------|--------------------------------------------|
| Facility Type: LOCATION | Facility ID: 327165 | API #: _____ | County Name: WELD |
| Facility Name: BUFFALO GARDENS U-62N68W 13NESE | Latitude: 40.136514 | Longitude: -104.945471 | |
| ** correct Lat/Long if needed: Latitude: _____ | | Longitude: _____ | |
| QtrQtr: NESE | Sec: 13 | Twp: 2N | Range: 68W Meridian: 6 Sensitive Area? Yes |

| | | | |
|--------------------------------------------------|---------------------|------------------------|--------------------------------------------|
| Facility Type: SPILL OR RELEASE | Facility ID: 481346 | API #: _____ | County Name: WELD |
| Facility Name: Buffalo Gardens U #13-4J Historic | Latitude: 40.137428 | Longitude: -104.944472 | |
| ** correct Lat/Long if needed: Latitude: _____ | | Longitude: _____ | |
| QtrQtr: NESE | Sec: 13 | Twp: 2N | Range: 68W Meridian: 6 Sensitive Area? Yes |

SITE CONDITIONS

General soil type - USCS Classifications SC

Most Sensitive Adjacent Land Use Residential

Is domestic water well within 1/4 mile? Yes

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

The nearest occupied building is located approximately 70 feet east of the site.
Wetlands are located approximately 175 feet north of the site.
Surface water is located approximately 440 feet north of the site.
The nearest domestic water well is located approximately 690 feet northeast of the site.
A livestock holding pen is located approximately 1,225 feet north of the site.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- ☐ E&P Waste ☐ Other E&P Waste ☒ Non-E&P Waste
- ☐ Produced Water ☐ Workover Fluids ☐ Non-Impacted Groundwater
- ☐ 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 |
|-----------|----------------|-------------------------------------|----------------------------------------------------|
| No | GROUNDWATER | No impacts encountered | Groundwater sampling and laboratory analysis |
| Yes | SOILS | ~180' (N-S) x ~135' (E-W) x 20' bgs | Excavation, soil sampling, and laboratory 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.

On December 13, 2021, a historical release of an unknown volume was discovered during reclamation activities at the previously decommissioned Buffalo Gardens U #13-4J Production Facility, and excavation activities were initiated. The ECMC issued Spill/Release Point 481346 for this release (Form 19 Document No. 402897368). Non-impacted groundwater was encountered in various excavation areas at depths ranging from approximately 3 feet to 7.5 feet below ground surface (bgs).

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):

Soil samples were collected as described in a previous Form 27-Supplemental update (Document No. 403141796). Based on the data presented, impacted soils in the excavation areas were removed and the remaining soils at this location are in compliance with the applicable ECMC Table 915-1 standards and/or within the range of site-specific background results. Current soil conditions at this site are in compliance with ECMC Table 915-1 standards.

Proposed Groundwater Sampling

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

Non-impacted groundwater was encountered in the excavation areas at depths ranging from approximately 3 to 7.5 feet bgs. On December 15, 2021 through September 27, 2022, four (4) groundwater samples (GW01, GW02, FL-GW01, and N-GW01) were collected and submitted for laboratory analysis of BTEX, naphthalene, and TMB. Analytical results indicated that constituent concentrations in the excavation groundwater samples were in compliance with Table 915-1 standards. Based on previous correspondence with the ECMC, ten (10) temporary groundwater monitoring wells (BH01 - BH10) were installed on October 19 - 20, 2023, to continue monitoring clean groundwater conditions. Quarterly groundwater monitoring was initiated on October 23, 2023, and is ongoing. Groundwater analytical data is presented in Table 1; the groundwater sample locations are illustrated on Figure 1. The laboratory analytical report for the initial Fourth Quarter 2023 groundwater monitoring event is provided in Attachment A.

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 111

Number of soil samples exceeding 915-1 58

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 5800

Groundwater

Number of groundwater samples collected 14

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 3

Number of groundwater monitoring wells installed 10

Number of groundwater samples exceeding 915-1 2

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.

NA / ND

-- Highest concentration of TPH (mg/kg) 831.2

-- Highest concentration of SAR 26.4

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 20

-- Highest concentration of Benzene (µg/l) 1.99

-- Highest concentration of Toluene (µg/l) 1.88

-- Highest concentration of Ethylbenzene (µg/l) 9.96

-- Highest concentration of Xylene (µg/l) 4.06

NA Highest concentration of Methane (mg/l)

OTHER INVESTIGATION INFORMATION☐ Were impacts to adjacent property or offsite impacts identified?☒ Were background samples collected as part of this site investigation?

Background soil samples were collected from undisturbed native material adjacent to the excavation areas, as described in a previous Form 27-Supplemental (Document No. 403141796).

☐ 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.

Between December 15, 2021 and September 27, 2022, approximately 1,600 cubic yards of impacted material were removed from the excavation areas and transported to the Front Range Landfill in Erie, Colorado for disposal; approximately 90 cubic yards of impacted material were removed from the excavation areas and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado for recycling; approximately 10 cubic yards of impacted material were removed from the excavation areas and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. Following the collection of the excavation groundwater samples (GW01, GW02, FL-GW01, and N-GW01), approximately 4,496 barrels of non-impacted groundwater were removed from the excavation areas via vacuum truck, for sidewall stability and backfilling purposes, and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. The excavation areas were subsequently backfilled and contoured to match pre-existing site conditions.

REMEDIATION 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.

Laboratory analytical results indicate that constituent concentrations in the confirmation soil samples collected from the final lateral and vertical excavation extents were in compliance with Table 915-1 standards and/or within the range of site-specific and area-specific background levels. Laboratory analytical results indicate that constituent concentrations in the 4 groundwater samples collected from the excavation areas (GW01, GW02, FL-GW01, N-GW01) were below laboratory detection limits (ND) or in compliance with ECMC Table 915-1 groundwater standards. Based on previous correspondence with the ECMC regarding this location, 10 temporary groundwater monitoring wells (BH01 - BH10) were installed on October 19 - 20, 2023, to continue monitoring clean groundwater conditions. Quarterly groundwater monitoring was initiated on October 23, 2023, and is ongoing. The 10 temporary groundwater monitoring wells will be sampled for three more quarters and submitted for laboratory analysis of Table 915-1 constituents. The estimated time to attain NFA is four quarters from the date of monitoring well installation and initiation of groundwater monitoring.

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) _____ 1700 |
| _____ Air sparge / Soil vapor extraction | _____ Name of Licensed Disposal Facility or COGCC Facility ID # _____ 149007 |
| _____ Natural Attenuation | No _____ Excavate and onsite remediation |
| _____ Other _____ | _____ Land Treatment |
| | _____ Bioremediation (or enhanced bioremediation) |
| | _____ Chemical oxidation |
| | _____ Other _____ |

Groundwater Remediation Summary

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

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.

Based on previous correspondence with the ECMC regarding this location, 10 temporary groundwater monitoring wells (BH01 - BH10) were installed on October 19 - 20, 2023, to continue monitoring clean groundwater conditions. Quarterly groundwater monitoring was initiated on October 23, 2023, and is ongoing. Upgradient monitoring well BH05 was selected as the background location for comparison to inorganic groundwater standards in Table 915-1. Based on a comparison to site-specific background concentrations, the total dissolved solids (TDS) concentration in monitoring well BH02 and the sulfate concentration in monitoring well BH03 were slightly above the Table 915-1 standard (1.25 x background) during the Fourth Quarter 2023 monitoring event. Kerr-McGee will continue to evaluate POC for Table 915-1 standards on a quarterly basis. The 10 temporary groundwater monitoring wells will continue to be sampled on a quarterly basis and submitted for laboratory analysis of Table 915-1 constituents. The temporary monitoring well locations are illustrated on Figure 1, and a potentiometric surface contour map for the Fourth Quarter 2023 is presented as Figure 2. Well completion logs for the temporary monitoring wells are provided in Attachment B.

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 Energy and Carbon Management 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: \$ 35000

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:

Approximately 90 cubic yards of impacted material were removed from the excavation areas and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado for recycling; approximately 10 cubic yards of impacted material were removed from the excavation areas and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. Approximately 4,496 barrels of non-impacted groundwater were removed from the excavation areas via vacuum truck, for sidewall stability and backfilling purposes, and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling.

Volume of E&P Waste (solid) in cubic yards 1700

E&P waste (solid) description Impacted soil

ECMC Disposal Facility ID #, if applicable: 149007

Non-ECMC Disposal Facility: Front Range Landfill - Erie, Colorado

Volume of E&P Waste (liquid) in barrels 4496

E&P waste (liquid) description Non-impacted Groundwater

ECMC Disposal Facility ID #, if applicable: 434766

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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

Does Groundwater meet Table 915-1 standards? Yes

Is additional groundwater monitoring to be conducted?

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 will be reclaimed in accordance with ECMC 1000 Series Reclamation Rules. Timeliness of reclamation initiation and completion will be subject to NFA, surface owner discretion and land use, and suitable ground conditions which allow for execution of surface reclamation activities so as to not cause unwarranted damages.

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? Yes

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

Did the local soil conservation district provide the seed mix? No

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 10/31/2024

Proposed date of completion of Reclamation. 11/30/2024

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. 12/14/2021

Actual Spill or Release date, or date of discovery. 12/13/2021

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/13/2021

Proposed site investigation commencement. 12/13/2021

Proposed completion of site investigation. 10/20/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/13/2021

Proposed date of completion of Remediation. 07/31/2024

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

Based on the Fourth Quarter 2023 groundwater monitoring results presented herein, and all groundwater concentrations within ECMC Table 915-1 standards, Kerr-McGee is requesting an annual Form 27-Supplemental reporting schedule for this site. The Project Implementation Summary is provided as Attachment C.

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

Signed: Gregory Hamilton

Title: Environmental Lead

Submit Date: 12/28/2023

Email: Gregory_Hamilton@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: Kari Brown

Date: 03/25/2024

Remediation Project Number: 22660

COA Type**Description**

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

Attachment Check 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**

| | |
|-----------|---------------------------------------------------|
| 403635356 | INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL) |
| 403635417 | ANALYTICAL RESULTS |
| 403635420 | LOGS |
| 403635422 | IMPLEMENTATION SCHEDULE |
| 403635429 | SITE MAP |
| 403635431 | GROUND WATER ELEVATION MAP |
| 403635432 | ANALYTICAL RESULTS |
| 403730526 | FORM 27-SUPPLEMENTAL-SUBMITTED |

Total Attach: 8 Files

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

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

Total: 0 comment(s)