

State of Colorado  
Energy & Carbon Management Commission

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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 COGCC 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 &amp; GAS ONSHORE LP</u>	Operator No: <u>47120</u>	<b>Phone Numbers</b>
Address: <u>P O BOX 173779</u>		Phone: <u>(970) 336-3500</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80217-3779</u>
Contact Person: <u>Phil Hamlin</u>	Email: <u>Phillip_Hamlin@oxy.com</u>	Mobile: <u>( )</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 13888 Initial Form 27 Document #: 402115667

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: Monitoring well reduction request

SITE INFORMATION

Yes  Multiple Facilities

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>451655</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Hopper 43-15. 23-15 &amp; 24-15 battery</u>	Latitude: <u>40.137266</u>	Longitude: <u>-104.989016</u>	
	** correct Lat/Long if needed: Latitude: <u>40.137409</u>	Longitude: <u>-104.989096</u>	
QtrQtr: <u>NWSE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>
Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>467861</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HOPPER 43-15A</u>	Latitude: <u>40.137270</u>	Longitude: <u>-104.989066</u>	
	** correct Lat/Long if needed: Latitude: _____	Longitude: _____	
QtrQtr: <u>NWSE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

## SITE CONDITIONS

General soil type - USCS Classifications SM

Most Sensitive Adjacent Land Use Agriculture

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**

A residential neighborhood is located approximately 250 feet (ft) southwest, and wetlands are located approximately 75 ft north.

# SITE INVESTIGATION PLAN

## TYPE OF WASTE:

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste      | <input type="checkbox"/> Other E&P Waste             | <input type="checkbox"/> Non-E&P Waste |
| <input checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids             |  |
| <input checked="" type="checkbox"/> Oil            | <input type="checkbox"/> Tank Bottoms                |  |
| <input checked="" type="checkbox"/> Condensate     | <input type="checkbox"/> Pigging Waste               |  |
| <input type="checkbox"/> Drilling Fluids           | <input type="checkbox"/> Rig Wash                    |  |
| <input type="checkbox"/> Drill Cuttings            | <input type="checkbox"/> Spent Filters               |  |
|  | <input type="checkbox"/> Pit Bottoms                 |  |
|  | <input type="checkbox"/> Other (as described by EPA) |  |

## DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	See attached data	Groundwater Samples/Lab. Analytical Results
Yes	SOILS	14' N-S X 16' E-W x 2.5' bgs	Soil Samples/Laboratory Analytical Results

## 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 September 19, 2019, historical petroleum hydrocarbon impacts were discovered during site decommissioning activities associated with the closure of two partially-buried produced water vessels (PWVs) at the Hopper 43-15A production facility. Based on the groundwater analytical results from sample GW01, a release was reported to the ECMC, and a Form 19 Initial with Supplemental (ECMC Document No. 402184111) was submitted on September 23, 2019. Site diagrams indicating sample locations, and analytical reports, were previously provided as attachments in a Form 27 Supplemental (ECMC Document No. 402224281) on November 20, 2019.

## 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 September 19, 2019, following removal of the two PWVs, soil samples were collected from the sidewalls and bases of the excavations. The soil samples were field screened for volatile organic compounds using a photoionization detector (PID). All soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH), and naphthalene. The base soil samples were also analyzed for pH, specific conductance (EC), and sodium adsorption ratio (SAR). Laboratory analytical results for all soil samples indicate that BTEX, TPH, SAR and EC concentrations and levels are in full compliance with ECMC Table 910-1 allowable levels. The base sample collected from the northern PWV excavation (N-B01@2.5') exceeded allowable levels for pH. This area was excavated and confirmation sample, B02@3.5', was collected; this sample is in compliance with ECMC Table 910-1 allowable levels for pH.

### Proposed Groundwater Sampling

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

On September 19, 2019, one groundwater sample (GW01) was collected from the excavation and submitted to Origins Laboratory in Denver, Colorado, for analysis of BTEX by USEPA 8260. The laboratory analytical results indicate that sample GW01 exceeded the ECMC Table 910-1 allowable levels for benzene at 43.3 ug/L. On September 20, 2019, following the removal of impacted groundwater, an additional groundwater sample (GW02) was collected from the excavation and submitted to Origins Laboratory in Denver, CO for analysis of BTEX by USEPA 8260. The laboratory analytical results indicate that sample GW02 exceeded the ECMC Table 910-1 allowable levels for benzene at 307 ug/L. The excavation groundwater sample locations are depicted on Figure 1. The groundwater analytical results are summarized on Table 1.

### 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 13  
Number of soil samples exceeding 915-1 1  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 224

### NA / ND

-- Highest concentration of TPH (mg/kg) 334.1  
-- Highest concentration of SAR 1.22  
BTEX > 915-1 No  
Vertical Extent > 915-1 (in feet) 2

### Groundwater

Number of groundwater samples collected 113  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 4  
Number of groundwater monitoring wells installed 8  
Number of groundwater samples exceeding 915-1 13

-- Highest concentration of Benzene (µg/l) 307  
-- Highest concentration of Toluene (µg/l) 7.36  
-- Highest concentration of Ethylbenzene (µg/l) 366  
-- Highest concentration of Xylene (µg/l) 3400  
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?

Were background samples collected as part of this site investigation?

A background sample was collected and analyzed for pH and sodium adsorption ratio (SAR).

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 40 cubic yards of soil were taken to the Front Range Regional Landfill in Erie, Colorado. Approximately 60 barrels of groundwater were removed from the excavation and taken to the Kerr-McGee Aggregate Recycling Facility in Weld County, Colorado.

### 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.

While backfilling the excavation, 50 pounds of COGAC™, a carbon-based groundwater remediation product, was applied to the clean backfill to mitigate remaining hydrocarbon impacts in groundwater. The safety data sheet for COGAC was provided in a previously submitted F27s (ECMC Document No. 402333786). As requested by the ECMC, one soil boring (SB01) was completed near MW02 to confirm soils outside the original excavation footprint meet ECMC Table 910-1 standards. Soil sample analytical results for SB01 were included in a previously submitted F27s (ECMC Document No. 402480246). Analytical results for SB01 were in full compliance with ECMC Table 910-1 allowable levels.

### Soil Remediation Summary

In Situ

Ex Situ

<input type="checkbox"/> Bioremediation ( or enhanced bioremediation )	<input type="checkbox"/> Yes	Excavate and offsite disposal
<input type="checkbox"/> Chemical oxidation		If Yes: Estimated Volume (Cubic Yards) <input type="text" value="40"/>
<input type="checkbox"/> Air sparge / Soil vapor extraction		Name of Licensed Disposal Facility or COGCC Facility ID # <input type="text"/>
<input type="checkbox"/> Natural Attenuation	<input type="checkbox"/>	Excavate and onsite remediation
<input type="checkbox"/> Other <input type="text"/>	<input type="checkbox"/>	Land Treatment
	<input type="checkbox"/>	Bioremediation (or enhanced bioremediation)
	<input type="checkbox"/>	Chemical oxidation
	<input type="checkbox"/>	Other <input type="text"/>

**Groundwater Remediation Summary**

<input type="checkbox"/> Yes	<input type="checkbox"/>	Bioremediation ( or enhanced bioremediation )
<input type="checkbox"/> Yes	<input type="checkbox"/>	Chemical oxidation
<input type="checkbox"/> No	<input type="checkbox"/>	Air sparge / Soil vapor extraction
<input type="checkbox"/> Yes	<input type="checkbox"/>	Natural Attenuation
<input type="checkbox"/> Yes	<input type="checkbox"/>	Other Chemically Oxygenated Granular Activated Carbon (COGAC™) application and groundwater removal <input type="text"/>

**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.

Five groundwater monitoring wells (MW01 - MW05) were installed on January 16, 2020. On June 25, 2020, three additional groundwater monitoring wells (MW06 – MW08) were installed in order to establish a downgradient point of compliance (POC). Quarterly groundwater sampling was initiated in July 2020 and the groundwater samples were submitted for BTEX by United States Environmental Protection Agency Method 8260D through the October 2020 monitoring event. Per the January 15, 2021 rule changes, groundwater samples were submitted for the full list of analytes for groundwater in Table 915-1 as of the January 2021 monitoring event. On April 7, 2021, the ECMC approved Kerr-McGee's request to remove the inorganic constituents in Table 915-1 from the ongoing quarterly monitoring program. Groundwater monitoring for Table 915-1 organic constituents only will continue on a quarterly basis until a No Further Action status request is warranted.

The monitoring well locations are depicted on Figure 1. A Groundwater Elevation Contour Map generated using the July 2023 survey data is provided as Figure 2. The groundwater analytical results are summarized in Table 1 and the laboratory analytical report from the July 2023 groundwater monitoring event is attached.

Based on groundwater analytical to date, Kerr-McGee requests the removal of groundwater monitoring well MW05 from the quarterly monitoring program. Monitoring well MW05 has been in full compliance with ECMC Table 915-1 allowable levels for 15 quarters and is no longer needed as a point of compliance well.

# 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 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 60 barrels of petroleum hydrocarbon impacted groundwater was transported to the Aggregate Recycle Facility in Weld County, Colorado, for recycling.

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_ 40

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

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Front Range Regional Landfill, Erie, Colorado

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_ 60

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

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_ 434766

Non-COGCC 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? \_\_\_\_\_

Does Groundwater meet Table 915-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

Operator shall comply with the COGCC 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 ECOM 1000 Series Reclamation Rules.

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. 09/20/2019

Actual Spill or Release date, or date of discovery. 09/20/2019

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/19/2019

Proposed site investigation commencement. 09/19/2019

Proposed completion of site investigation. 09/20/2019

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 09/19/2019

Proposed date of completion of Remediation. 09/19/2025

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: Phil Hamlin

Title: Sr. Environmental Rep.

Submit Date: 09/29/2023

Email: Phillip\_Hamlin@oxy.com

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

COGCC Approved: Kari Brown

Date: 10/16/2023

Remediation Project Number: 13888

**COA Type****Description**

	ECMC agrees to the reduced groundwater monitoring program. If future data indicate the need for additional site characterization or establishing point of compliance, ECMC may require additional monitoring wells be returned to the program.
1 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**

403525388	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403525431	ANALYTICAL RESULTS
403545171	ANALYTICAL RESULTS
403545439	SITE MAP
403545440	GROUND WATER ELEVATION MAP
403562178	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 6 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)