

**State of Colorado**  
**Oil and Gas Conservation Commission**

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Report taken by:  
Alexander Ahmadian

**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>Phillip Hamlin</u>	Email: <u>Phillip_Hamlin@oxy.com</u>	Mobile: <u>( )</u>

**PROJECT, PURPOSE & SITE INFORMATION**

**PROJECT INFORMATION**

Remediation Project #: 9675 Initial Form 27 Document #: 200439575

**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>TANK BATTERY</u>	Facility ID: <u>440852</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>SPILL/RELEASE POINT</u>	Latitude: <u>40.268799</u>	Longitude: <u>-104.723004</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWNE</u>	Sec: <u>36</u>	Twp: <u>4N</u>	Range: <u>66W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

**SITE CONDITIONS**

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Non-Crop Land  
 Is domestic water well within 1/4 mile? Yes Is surface water within 1/4 mile? No  
 Is groundwater less than 20 feet below ground surface? Yes

**Other Potential Receptors within 1/4 mile**

A livestock pasture is located approximately 100 feet southwest of the release location.  
The nearest domestic water well is located approximately 600 feet northwest of the release location.  
Multiple industrial-use buildings are located within 1/4 mile of the release location.

**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 sampling and laboratory analysis
Yes	SOILS	100' (N-S) x 80' (E-W) x 19' bgs	Soil boring, 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 February 9, 2015, historical hydrocarbon impacts were discovered during abandonment activities at the HSR-Corvi 2-36 production facility, and excavation activities were initiated. Groundwater was not encountered during excavation activities. The COGCC issued Spill/Release Point ID 440852 for this release.

**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 the Initial Form 27 (COGCC Document No. 200439575). Due to the presence of multiple active subsurface lines, impacted soil was left in-place in the vicinity of excavation soil samples N01@15', S01@15', W01@15', and B01@18'. Between March 5 and 10, 2015, multiple soil borings were advanced around the excavation area, in order to complete the delineation of soil impacts. These borings were advanced to the limit of the soil impacts observed during drilling; soil samples collected from borings W-BH02 and NW-BH06 exhibited constituent concentrations out of compliance with the COGCC Table 910-1 standards.

**Proposed Groundwater Sampling**

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

The soil borings advanced between March 5 and 10, 2015 yielded groundwater, and as such borings S-BH01, W-BH02, N-BH03, N-BH04, W-BH05, and NW-BH06 were converted to temporary groundwater monitoring wells BH01 - BH06. Samples collected from these locations indicated that groundwater impacts were present at the site. Between August 17 and 25, 2015, 5 additional temporary monitoring wells (BH07 - BH11) were installed to further assess the extent of groundwater impacts. Quarterly groundwater monitoring was initiated on March 11, 2015, and is ongoing at the ten (10) temporary monitoring wells remaining at the site (BH01 - BH07, BH09 - BH11); BH08 was removed from the monitoring program under an approved reduction request (COGCC Document No. 402943641). Groundwater analytical data is presented in Table 1, and the groundwater sample locations are illustrated on Figure 1. The laboratory analytical reports for the previous four quarters of groundwater monitoring are provided as 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 ):

Groundwater samples have been intermittently collected from select site remediation wells, as needed, for remediation system monitoring and optimization purposes. Groundwater analytical results for the remediation wells are included in Table 1.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 14  
Number of soil samples exceeding 915-1 7  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 6600

### NA / ND

-- Highest concentration of TPH (mg/kg) 2650  
NA Highest concentration of SAR \_\_\_\_\_  
BTEX > 915-1 Yes  
Vertical Extent > 915-1 (in feet) 19

### Groundwater

Number of groundwater samples collected 341  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 14  
Number of groundwater monitoring wells installed 30  
Number of groundwater samples exceeding 915-1 122

-- Highest concentration of Benzene (µg/l) 13900  
-- Highest concentration of Toluene (µg/l) 20500  
-- Highest concentration of Ethylbenzene (µg/l) 760  
-- Highest concentration of Xylene (µg/l) 22000  
NA Highest concentration of Methane (mg/l) \_\_\_\_\_

### Surface Water

0 Number of surface water samples collected  
0 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 out of compliance with the COGCC standards were historically detected in off-Site temporary monitoring well BH01.

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?

Impacted soil and groundwater remain at the site. The 10 temporary groundwater monitoring wells remaining (BH01 - BH07, BH09 - BH11) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of the organic constituents in COGCC Table 915-1 (benzene, toluene, ethylbenzene total xylenes [BTEX], naphthalene, 1,2,4- and 1,3,5-trimethylbenzene [TMB]). Kerr-McGee previously received COGCC approval to remove the inorganic constituents in Table 915-1 (chloride, sulfate, total dissolved solids) from the ongoing semi-annual groundwater monitoring program at this location, as described in a previous Form 27-Supplemental Update (COGCC Document No. 402646251). Additional confirmation soil samples will be collected from the final extent of the impacted soil area, subsequent to the completion of soil remediation activities.

## 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.

On February 9, 2015, approximately 150 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Remaining hydrocarbon-impacted soil that was left in place is being addressed as described below.

### 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.

Kerr-McGee selected air sparge (AS) and soil vapor extraction (SVE) as remedial technologies to address remaining hydrocarbon impacts to soil and groundwater at the site. Between November 29, 2017 and February 26, 2018, 9 AS remediation wells (AS-01 through AS-09) and 10 SVE remediation wells (SVE-01 through SVE-10) were installed for use with an on-site remediation system. Remediation system construction and start-up activities were described in a previous Form 27-Supplemental Update (COGCC Document No. 401903958). The as-built locations of the remediation system wells are illustrated on Figure 1, and the remediation well completion logs are included in Attachment B. Additional AS/SVE remediation system details and the approved USEPA Underground Injection Control (UIC) permit for AS activities were provided in previous Form 27-Supplemental Updates (COGCC Document Nos. 401903958 and 401618615). Quarterly groundwater monitoring is ongoing, and will be continued until concentrations remain in compliance with the COGCC Table 915-1 standards. Estimated time to attain NFA is TBD based on the groundwater concentrations, the extent of impacted soil and groundwater, and the efficacy of the selected remedial technologies.

**Soil Remediation Summary**

In Situ

Ex Situ

No Bioremediation ( or enhanced bioremediation )

Yes Excavate and offsite disposal

No Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) 150

Yes Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_

Yes Natural Attenuation

No Excavate and onsite remediation

No Other \_\_\_\_\_

\_\_\_\_\_ Land Treatment

\_\_\_\_\_ Bioremediation (or enhanced bioremediation)

\_\_\_\_\_ Chemical oxidation

\_\_\_\_\_ Other \_\_\_\_\_

**Groundwater Remediation Summary**

No Bioremediation ( or enhanced bioremediation )

No Chemical oxidation

Yes Air sparge / Soil vapor extraction

Yes Natural Attenuation

No 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.

Between March 5 and August 25, 2015, 11 temporary groundwater monitoring wells (BH01 - BH11) were installed at the site to assess the extent of groundwater impacts. Monitoring well BH08 was removed from the groundwater monitoring program under an approved reduction request (COGCC Document No. 402943641), and was subsequently abandoned and removed from the site. The 10 remaining temporary groundwater monitoring wells (BH01 - BH07, BH09 - BH11) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of the organic constituents in COGCC Table 915-1 (BTEX, naphthalene, TMB). Kerr-McGee previously received COGCC approval to remove the inorganic constituents in Table 915-1 (chloride, sulfate, total dissolved solids) from the ongoing semi-annual groundwater monitoring program at this location, as described in a previous Form 27-Supplemental Update (COGCC Document No. 402646251). Groundwater sample locations are illustrated on Figure 1, and a potentiometric surface contour map for the Fourth Quarter 2022 is presented as Figure 2. Well completion logs for the temporary monitoring wells are included 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 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: \$ 200000

## 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:

NA

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_ 150

E&P waste (solid) description \_\_\_\_\_ Impacted soil

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

Non-COGCC Disposal Facility: Buffalo Ridge Landfill - Keenesburg, Colorado

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_ 0

E&P waste (liquid) description \_\_\_\_\_

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

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? 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 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 has been restored to its pre-release grade. Kerr-McGee will conduct reclamation activities in accordance with COGCC 1000 Series 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. 02/10/2015

Actual Spill or Release date, or date of discovery. 02/09/2015

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/09/2015

Proposed site investigation commencement. 02/09/2015

Proposed completion of site investigation. \_\_\_\_\_

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 02/09/2015

Proposed date of completion of Remediation. \_\_\_\_\_

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 previously approved reporting frequency, Kerr-McGee will continue to provide annual Form 27-Supplemental updates 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: Phillip Hamlin

Title: Senior Environmental Rep

Submit Date: 02/28/2023

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: Alexander Ahmadian

Date: 04/20/2023

Remediation Project Number: 9675

**COA Type****Description**

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**

Att Doc Num	Name
403311299	FORM 27-SUPPLEMENTAL-SUBMITTED
403311331	LOGS
403311349	SITE MAP
403311350	GROUND WATER ELEVATION MAP
403311351	ANALYTICAL RESULTS
403311352	IMPLEMENTATION SCHEDULE
403311353	ANALYTICAL RESULTS

Total Attach: 7 Files

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

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)