

# State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



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Receive Date:

Report taken by:

## 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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

### OPERATOR INFORMATION

|   |           |                                 |               |
|---|-----------|---------------------------------|---------------|
| Name of Operator: KERR MCGEE OIL & GAS ONSHORE LP |           | Operator No: 47120              | Phone Numbers |
| Address: P O BOX 173779                           |           |                                 |               |
| City: DENVER                                      | State: CO | Zip: 80217-3779                 |               |
| Contact Person: Phillip Hamlin                    |           | Email: Phil.Hamlin@anadarko.com |               |
|   |           | Phone: (970) 336-3500           |               |
|   |           | Mobile: (970) 515-1161          |               |

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 9879

Initial Form 27 Document #: 200440443

#### PURPOSE INFORMATION

- |  |  |
|--|--|
| <input type="checkbox"/> 901.e. Sensitive Area Determination                                       | <input checked="" type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water        |
| <input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure                             | <input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b. |
| <input checked="" type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation                 | <input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project                                  |
| <input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste                      | <input type="checkbox"/> Rule 906.c.: Director request   |
| <input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure | <input type="checkbox"/> Other   |

#### SITE INFORMATION

N Multiple Facilities ( in accordance with Rule 909.c. )

|                                    |                     |  |  |
|------------------------------------|---------------------|--|--|
| Facility Type: SPILL OR RELEASE    | Facility ID: 447504 | API #:                                   | County Name: WELD                          |
| Facility Name: SPILL/RELEASE POINT |                     | Latitude: 40.199599                      | Longitude: -104.827355                     |
|                                    |                     | ** correct Lat/Long if needed: Latitude: | Longitude:                                 |
| QtrQtr: NWNW                       | Sec: 30             | Twp: 3N                                  | Range: 66W Meridian: 6 Sensitive Area? Yes |

#### SITE CONDITIONS

General soil type - USCS Classifications SW

Most Sensitive Adjacent Land Use Non Crop Land

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 livestock grazing area is located approximately 145 feet south of the release location. An occupied building is located approximately 230 feet northwest of the release location.

# 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 sampling and laboratory analysis       |
| Yes       | SOILS          | 20' (E-W) x 13' (N-S) x 5' 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 August 24, 2016, a release due to a corroded separator fire tube was discovered at the Lorenz Federal L30-4, L30-3; Lorenz L30-5 production facility. The location was shut in, associated infrastructure removed, and excavation activities were initiated. Groundwater was encountered in the excavation at approximately 5 feet below ground surface (bgs). The COGCC has issued Spill/Release Point ID 447504 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. Based on the data presented, impacted soils in the excavation were remediated to be in full compliance with COGCC standards.

### Proposed Groundwater Sampling

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

On March 7, 2018, four (4) temporary monitoring wells (BH01 - BH04) were installed to further assess the extent of groundwater impacts. Quarterly groundwater monitoring was initiated on April 2, 2018, and is ongoing. Groundwater samples are collected from the temporary monitoring wells on a quarterly basis and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater analytical data is presented in Table 1, and the groundwater sample locations are illustrated on Figure 1. Laboratory analytical reports 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 ):

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 6  
Number of soil samples exceeding 910-1 1  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 200

### NA / ND

-- Highest concentration of TPH (mg/kg) 464  
NA Highest concentration of SAR           
BTEX > 910-1 Yes  
Vertical Extent > 910-1 (in feet) 5

### Groundwater

Number of groundwater samples collected 11  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 2'  
Number of groundwater monitoring wells installed 4  
Number of groundwater samples exceeding 910-1 4

-- Highest concentration of Benzene (µg/l) 105  
-- Highest concentration of Toluene (µg/l) 427  
-- Highest concentration of Ethylbenzene (µg/l) 185  
-- Highest concentration of Xylene (µg/l) 1490  
NA Highest concentration of Methane (mg/l)         

### Surface Water

0 Number of surface water samples collected  
0 Number of surface water samples exceeding 910-1  
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?

☐ 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?

Hydrocarbon impacted groundwater remains at the site. The 4 temporary groundwater monitoring wells will continue to be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with COGCC standards for four consecutive quarters. Additional temporary groundwater monitoring wells will be installed to maintain point-of-compliance (POC).

# 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 August 24 and 25, 2016, approximately 50 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado. Approximately 80 barrels of impacted groundwater were removed from the excavation area via vacuum truck and transported to a licensed disposal facility.

## 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 data indicate that impacted soils in the excavation area have been remediated to be in full compliance with COGCC standards. Prior to backfilling, approximately 165 pounds of activated carbon were added to the groundwater within the excavation area to mitigate remaining hydrocarbon impacts in groundwater. Quarterly groundwater monitoring is ongoing and will be continued until concentrations remain in full compliance with COGCC standards for four consecutive quarters. Additional potential remediation measures are currently under evaluation to address remaining groundwater impacts. Estimated time to attain NFA is TBD based on the groundwater concentrations, the extent of impacted groundwater, and the efficacy of the selected remedial technologies.

## Soil Remediation Summary

☐ In Situ

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

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

\_\_\_\_\_ Air sparge / Soil vapor extraction

\_\_\_\_\_ Natural Attenuation

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

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 50

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

No Excavate and onsite remediation

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

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

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

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

## Groundwater Remediation Summary

No \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

No \_\_\_\_\_ Chemical oxidation

No \_\_\_\_\_ Air sparge / Soil vapor extraction

Yes \_\_\_\_\_ Natural Attenuation

Yes \_\_\_\_\_ Other \_\_\_\_\_ Groundwater removal, activated carbon adsorption

## 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.

On March 7, 2018, 4 temporary groundwater monitoring wells (BH01 - BH04) were installed at the site to assess the extent of groundwater impacts. The temporary monitoring wells will continue to be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with COGCC standards for four consecutive quarters. Additional temporary monitoring wells will be installed to maintain POC. Groundwater sample locations are illustrated on Figure 1, and a potentiometric surface contour map for the Third Quarter 2018 is presented as Figure 2. Well completion logs for the temporary monitoring wells are included as Attachment B.

## REMEDATION PROGRESS UPDATE

### PERIODIC REPORTING

**Frequency:** ☐ Quarterly ☐ Semi-Annually ☒ Annually ☐ Other \_\_\_\_\_

**Report Type:** ☒ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report  
☐ Other \_\_\_\_\_

### 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 \_\_\_\_\_ 50

E&P waste (solid) description Hydrocarbon 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 \_\_\_\_\_ 80

E&P waste (liquid) description Hydrocarbon impacted groundwater \_\_\_\_\_

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

Non-COGCC Disposal Facility: Licensed disposal facility \_\_\_\_\_

## REMEDATION COMPLETION REPORT

### REMEDATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No \_\_\_\_\_

Do all soils meet Table 910-1 standards? \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? \_\_\_\_\_

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? \_\_\_\_\_

Does Groundwater meet Table 910-1 standards? \_\_\_\_\_

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

## 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 consult with the surface owner to determine reclamation specifics to properly 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 approve the seed mix? \_\_\_\_\_

If NO, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

## IMPLEMENTATION SCHEDULE

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. 08/24/2016

Actual Spill or Release date, if known. \_\_\_\_\_

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 08/24/2016

Date of commencement of Site Investigation. 08/24/2016

Date of completion of Site Investigation. \_\_\_\_\_

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 08/24/2016

Date of completion of Remediation. \_\_\_\_\_

### SITE RECLAMATION DATES

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

### 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 HSE Representative

Submit Date: ` \_\_\_\_\_

Email: Phil.Hamlin@anadarko.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: \_\_\_\_\_

Date: \_\_\_\_\_

Remediation Project Number: 9879

### COA Type

### Description

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

### 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

|           |                              |
|-----------|------------------------------|
| 401768276 | LOGS                         |
| 401768279 | GROUND WATER SAMPLE LOCATION |
| 401768283 | GROUND WATER ELEVATION MAP   |
| 401768292 | ANALYTICAL RESULTS           |
| 401768294 | ANALYTICAL RESULTS           |

Total Attach: 5 Files

### General Comments

#### User Group

#### Comment

#### Comment Date

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

Total: 0 comment(s)