

# State of Colorado Oil and Gas Conservation Commission

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Report taken by:

CHRIS CANFIELD

## 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              | <b>Phone Numbers</b><br>Phone: (970) 336-3500<br>Mobile: (970) 515-1161 |
| Address: P O BOX 173779                           |                                 |   |
| City: DENVER                                      | State: CO Zip: 80217-3779       |   |
| Contact Person: Phil Hamlin                       | Email: Phil.Hamlin@anadarko.com |   |

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 9828 Initial Form 27 Document #: 2526907

#### 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: 444878 | API #: _____                                   | County Name: WELD                          |
| Facility Name: SPILL/RELEASE POINT |                     | Latitude: 40.016982                            | Longitude: -104.955940                     |
|                                    |                     | ** correct Lat/Long if needed: Latitude: _____ | Longitude: _____                           |
| QtrQtr: NWSW                       | Sec: 25             | Twp: 1N  | Range: 68W Meridian: 6 Sensitive Area? Yes |

#### SITE CONDITIONS

General soil type - USCS Classifications SC 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

An occupied building is located approximately 1,285 feet southwest of the release area.

## 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                                     |
|-----------|----------------|---------------------------------|--|
|           | GROUNDWATER    | See Attached Data               | Groundwater sampling and laboratory analysis       |
|           | SOILS          | 66' (E-W) x 52' (N-S) x 20' BGS | Soil excavation, 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 13, 2016, an operator discovered a release from a dumphine during routine activities at the UPRC-61N68W/25NWSW production facility. Between one and five barrels of oil were released outside the secondary containment but remained on the lease property. The facility was shut in, affected infrastructure removed and excavation activities were initiated. Groundwater was encountered in the excavation area at approximately 20 feet below ground surface (bgs). The COGCC has issued Spill Tracking #444878 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 below COGCC Table 910-1 standards.

#### Proposed Groundwater Sampling

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

On June 1, 2016, temporary monitoring well BH01 was installed in the vicinity of the area of release, and a groundwater sample was collected and submitted to Origins Laboratory for analysis of BTEX as described in the Initial Form 27. Based on groundwater sampling results, 11 additional temporary monitoring and/or remediation wells were installed to further assess the extent of groundwater impacts, and/or for remediation purposes. Groundwater samples are collected on a quarterly basis from the 12 wells at the site and analyzed for BTEX. Groundwater analytical data is presented in Table 1, and the groundwater sample locations are illustrated on Figure 1. Laboratory analytical reports are included 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 20  
Number of soil samples exceeding 910-1 4  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 3432

### NA / ND

-- Highest concentration of TPH (mg/kg) 491  
NA Highest concentration of SAR           
BTEX > 910-1 Yes  
Vertical Extent > 910-1 (in feet) 20

### Groundwater

Number of groundwater samples collected 31  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 14'  
Number of groundwater monitoring wells installed 12  
Number of groundwater samples exceeding 910-1 15

-- Highest concentration of Benzene (µg/l) 15300  
0  
-- Highest concentration of Toluene (µg/l) 10900  
00  
-- Highest concentration of Ethylbenzene (µg/l) 14000  
0  
-- Highest concentration of Xylene (µg/l) 22600  
00  
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?

Groundwater impacted above COGCC Table 910-1 standards has been detected in off-site temporary monitoring wells. These temporary monitoring well locations are included in the on-going site groundwater monitoring program.

☐ 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?

Data indicate that impacted soil has been delineated and removed from the site. Twelve temporary monitoring wells were installed to further assess groundwater impacts. Pending receipt of groundwater analytical data, additional point-of-compliance wells may be installed, if necessary. Groundwater analytical results are summarized in Table 1. Groundwater sample locations are presented on Figure 1. Analytical laboratory reports are included as Attachment A and temporary monitoring well completion logs are included as Attachment B.

# 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 March 22 and May 13, 2013, approximately 2,350 cubic yards of impacted material were excavated and transported to the Front Range Regional Landfill in Weld County, Colorado for disposal. Laboratory results indicated that constituent concentrations in soil samples collected from the final lateral extent of the excavation area were below the applicable COGCC Table 910-1 standards. Soils were excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to seasonal fluctuations.

## 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.

Following the excavation and sampling activities described in the Initial Form 27, ongoing gauging and removal of light non-aqueous phase liquid (LNAPL) from temporary groundwater monitoring well BH01 was initiated on a bi-weekly schedule. Additional temporary groundwater monitoring wells were subsequently installed, as described below, and ongoing quarterly groundwater monitoring activities were initiated. Estimated time to attain NFA is TBD based on the review of groundwater concentrations, the extent of impacted groundwater, and the efficacy of 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) \_\_\_\_\_ 2350  
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 \_\_\_\_\_ LNAPL removal \_\_\_\_\_

## 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 June 1, 2016 and March 29, 2017, a total of 12 temporary groundwater monitoring wells 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 below COGCC groundwater standards for four consecutive quarters. Point of compliance will continue to be monitored quarterly through an analytical data review and the evaluation of potentiometric flow direction. Groundwater sample locations are illustrated on Figure 1, and a potentiometric surface contour map for the Second Quarter 2017 is presented as Figure 2. Well completion logs for the temporary monitoring and/or remediation wells at the site 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 2350

E&P waste (solid) description Hydrocarbon impacted soil

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

Non-COGCC Disposal Facility: Front Range Regional Landfill - Weld County, CO

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

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

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

Non-COGCC 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? Yes

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. 02/13/2016

Actual Spill or Release date, if known. 02/13/2016

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). \_\_\_\_\_

Date of commencement of Site Investigation. 02/13/2016

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

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 03/22/2016

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: Phil Hamlin

Title: Senior HSE Representative

Submit Date: 06/23/2017

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: CHRIS CANFIELD

Date: 08/09/2017

Remediation Project Number: 9828

### 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

|           |                                |
|-----------|--------------------------------|
| 401309994 | FORM 27-SUPPLEMENTAL-SUBMITTED |
| 401314392 | GROUND WATER SAMPLE LOCATION   |
| 401314395 | GROUND WATER ELEVATION MAP     |
| 401314398 | ANALYTICAL RESULTS             |
| 401314400 | ANALYTICAL RESULTS             |
| 401314407 | LOGS                           |

Total Attach: 6 Files

## General Comments

### User Group

### Comment

### Comment Date

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

Total: 0 comment(s)