

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

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Report taken by:  
PETER GINTAUTAS

**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: <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>Phil.Hamlin@anadarko.com</u>	Mobile: <u>( )</u>

**PROJECT, PURPOSE & SITE INFORMATION**

**PROJECT INFORMATION**  
Remediation Project #: 9477 Initial Form 27 Document #: 200438884

**PURPOSE INFORMATION**

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input 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 type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation	<input checked="" 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: <u>SPILL OR RELEASE</u>	Facility ID: <u>443884</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>SPILL/RELEASE POINT</u>	Latitude: <u>40.209790</u>	Longitude: <u>-104.903825</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>21</u>	Twp: <u>3N</u>	Range: <u>67W</u>
Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

**SITE CONDITIONS**

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Rangeland

Is domestic water well within 1/4 mile? No 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**

Surface water and wetlands approximately 250 feet (ft) southwest and groundwater approximately 4 ft below ground surface (bgs).

# 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/Laboratory Analysis
No	SOILS	15 ft N-S x 20 ft E-W x 5 ft bgs	Soil Sampling/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.

During deconstruction activities at the HSR-Redmond-63N67W/21NWSW tank battery, historical petroleum hydrocarbon impacted soil and groundwater were encountered beneath the produced water sump. The volume of the release is unknown.

## 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 October 30, 2015, following removal of the produced water sump, four soil samples were collected from the excavation sidewalls. The soil samples were field-screened for total volatile organic compounds using a photoionization detector (PID). Soil staining, odor, and/or elevated headspace readings (greater than 1.0 parts per million) were not observed or identified through PID screening. Based on field-screening results and estimated groundwater flow direction, only the northern sidewall soil sample (N01@3.5') was submitted for laboratory analysis of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Analytical results indicated the soil sample was in full compliance with Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 allowable levels. The soil sample location is depicted on the Excavation Site Map attached as Figure 1, and the analytical results are summarized on Table 1.

### Proposed Groundwater Sampling

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

On October 30, 2015, one groundwater sample (GW01) was collected from the excavation and submitted for laboratory analysis of BTEX. Laboratory analytical results for groundwater sample GW01 indicated that the benzene concentration exceeded the COGCC Table 910-1 allowable level at 5.1 micrograms per liter (µg/L). On November 2, 2015, following removal of approximately 24 barrels of petroleum hydrocarbon impacted groundwater from the excavation, a second groundwater sample (GW02) was collected from the excavation. Laboratory results for groundwater sample GW02 indicated that benzene exceeded the COGCC Table 910-1 allowable level for benzene at 10.7 µg/L. The excavation groundwater sample locations are depicted on Figure 1, and analytical results are summarized in Table 2.

### 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 1  
Number of soil samples exceeding 910-1 0  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 300

### NA / ND

ND Highest concentration of TPH (mg/kg) \_\_\_\_\_  
NA Highest concentration of SAR \_\_\_\_\_  
BTEX > 910-1 No  
Vertical Extent > 910-1 (in feet) 0

### Groundwater

Number of groundwater samples collected 19  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 4'  
Number of groundwater monitoring wells installed 5  
Number of groundwater samples exceeding 910-1 2

-- Highest concentration of Benzene (µg/l) 10.7  
-- Highest concentration of Toluene (µg/l) 30.8  
-- Highest concentration of Ethylbenzene (µg/l) 2  
-- Highest concentration of Xylene (µg/l) 17.6  
NA Highest concentration of Methane (mg/l) \_\_\_\_\_

### Surface Water

0 Number of surface water samples collected  
         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?

# 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 10 cubic yards of petroleum hydrocarbon impacted soil were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling. Impacted soil was excavated into the capillary and phreatic zones to address potential hydrocarbon impacts that may have been present below the groundwater table due to past seasonal fluctuations. Approximately 24 barrels of impacted groundwater were transported to a licensed injection facility for disposal. The general site layout and excavation footprint are depicted on the Excavation Site Map provided as Figure 1.

## 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.

Petroleum hydrocarbon impacted soil was excavated, and petroleum hydrocarbon impacted groundwater was removed from the excavation. The excavation was backfilled with clean fill and the Kerr-McGee tank battery was deconstructed.

## Soil Remediation Summary

In Situ

Ex Situ

<u>      </u> Bioremediation ( or enhanced bioremediation )	<u>Yes</u> Excavate and offsite disposal
<u>      </u> Chemical oxidation	<u>      </u> If Yes: Estimated Volume (Cubic Yards) <u>      </u> 10
<u>      </u> Air sparge / Soil vapor extraction	<u>      </u> Name of Licensed Disposal Facility or COGCC Facility ID # <u>      </u> 149007
<u>      </u> Natural Attenuation	<u>No</u> Excavate and onsite remediation
<u>      </u> Other <u>      </u>	<u>      </u> Land Treatment
	<u>      </u> Bioremediation (or enhanced bioremediation)
	<u>      </u> Chemical oxidation
	<u>      </u> Other <u>      </u>

## Groundwater Remediation Summary

No Bioremediation ( or enhanced bioremediation )

No Chemical oxidation

No Air sparge / Soil vapor extraction

Yes Natural Attenuation

Yes Other        Groundwater 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.

Monitoring wells MW01 through MW04 were installed at the site in January 2018. Groundwater monitoring continued on a quarterly basis. Based on the surveyed groundwater flow direction, an additional monitoring well (MW05) was installed in November 2018, to verify point of compliance cross-gradient of the excavation. The monitoring well locations are depicted on Figure 2. Boring logs with well completion diagrams are included as an attachment.

On January 17, 2018, monitoring wells MW01 through MW04 were surveyed to obtain the relative groundwater and top-of-casing well elevation data. The survey data indicated the groundwater flow direction at the site is to the north. On November 5, 2018, monitoring well MW05 was tied into the survey data. The survey data confirmed the groundwater flow direction at the site is to the north. Groundwater Elevation Contour Maps for the first quarter 2018 through fourth quarter 2018 monitoring events are provided as Figures 3A through 3D. Relative groundwater elevations are provided in Table 2.

As of the fourth quarter 2018 quarterly monitoring event, BTEX concentrations in monitoring wells MW01 through MW05 were in full compliance with COGCC Table 910-1 allowable levels for four consecutive quarterly monitoring events. The groundwater analytical results are summarized in Table 2. The analytical reports for the four compliant groundwater monitoring events are attached.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

**Frequency:**  Quarterly  Semi-Annually  Annually  Other Final Report  
**Report Type:**  Groundwater Monitoring  Land Treatment Progress Report  O&M Report  
 Other No Further Action Status Request

## 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:

The petroleum hydrocarbon impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling.

Volume of E&P Waste (solid) in cubic yards 10

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

COGCC Disposal Facility ID #, if applicable: 149007

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels 24

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

COGCC Disposal Facility ID #, if applicable: 159443

Non-COGCC Disposal Facility:

## REMEDIATION COMPLETION REPORT

### REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? Yes

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

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? Yes

Is additional groundwater monitoring to be conducted? No

## 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 Kerr-McGee facility was deconstructed, and the site was restored to its pre-release grade.

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. 11/02/2015

Actual Spill or Release date, if known. 11/02/2015

### **SITE INVESTIGATION DATES**

Date of Initial Actions described in Site Investigation Plan (start date). 10/30/2015

Date of commencement of Site Investigation. 10/30/2015

Date of completion of Site Investigation. 01/18/2018

### **REMEDIAL ACTION DATES**

Date of commencement of Remediation. 11/02/2015

Date of completion of Remediation. 11/05/2018

### **SITE RECLAMATION DATES**

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

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

**OPERATOR COMMENT**

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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: 12/03/2018 \_\_\_\_\_

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: PETER GINTAUTAS \_\_\_\_\_

Date: 12/03/2018 \_\_\_\_\_

Remediation Project Number: 9477 \_\_\_\_\_

**COA Type****Description**

	Based on the information presented, it appears that no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if ground water is found to be impacted, then further investigation and/or further remediation activities may be required. In addition, the surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.
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**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**

401840512	FORM 27-SUPPLEMENTAL-SUBMITTED
401847039	SOIL SAMPLE LOCATION MAP
401847042	SITE MAP
401847045	GROUND WATER ELEVATION MAP
401847061	LOGS
401849272	ANALYTICAL RESULTS

Total Attach: 6 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)