

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:  
401814675

Receive Date:

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Report taken by:

Site Investigation and Remediation Workplan (Initial 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>
Address: P O BOX 173779		Phone: (970) 336-3500
City: DENVER	State: CO	Zip: 80217-3779
Contact Person: Phil Hamlin	Email: phil.hamlin@anadarko.com	
		Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**

Remediation Project #: \_\_\_\_\_ Initial Form 27 Document #: 401814675

**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 checked="" 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: 456515	API #: _____	County Name: WELD
Facility Name: SPILL/RELEASE POINT	Latitude: 40.262042	Longitude: -104.905178	
	** correct Lat/Long if needed: Latitude: 40.262042	Longitude: -104.905178	
QtrQtr: NENE	Sec: 5	Twp: 3N	Range: 67W
	Meridian: 6	Sensitive Area? Yes	

**SITE CONDITIONS**

General soil type - USCS Classifications   SP        Most Sensitive Adjacent Land Use   Cropland  

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

# 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 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	To be determined	Laboratory analysis
Yes	SOILS	Approximately 45'(L)x29'(W)x15'(D)	Field Screening and laboratory 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.

While rebuilding the WCR Properties 41-5/Spaur 1-5 tank battery, soil and groundwater with historical petroleum hydrocarbon impacts were discovered. Between August 3 and August 9th, 2018, impacted soil was removed and confirmation soil samples were collected from the excavation and analyzed for Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 constituents of concern (TPH and BTEX). Laboratory results for the sidewalls and base sample from the final extents of the excavation were within allowable limits for COGCC Table 910-1 constituents of concern. Groundwater was encountered in the excavation at approximately 12 feet below ground surface (bgs). On August 6th, 2018, a groundwater sample collected from the excavation resulted in a COGCC Table 910-1 exceedance of benzene at 2,010 ppb. After additional excavation was performed, a subsequent groundwater sample resulted in a COGCC Table 910-1 exceedance for benzene at 5.52 ppb.

## 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 from the sidewalls of the excavation at approximately 10 and 12 feet bgs, and from the base at 15 feet bgs. The soil samples were submitted to Origins Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH)- gasoline range organics (GRO) by USEPA Method 8206C, TPH diesel and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC) and pH. Laboratory analytical results indicated that constituent concentrations in the soil samples collected from the final extents of the excavation area were in full compliance with State standards. Soil sample analytical data is presented in Table 1, and soil sample locations are illustrated on the attached Site Diagram. The laboratory analytical reports are included as Attachment A.

### Proposed Groundwater Sampling

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

Groundwater was encountered in the excavation area at approximately 12 feet bgs. A groundwater sample was collected from the excavation and submitted to Origins Laboratory for analysis of BTEX by USEPA Method 8260. Groundwater analytical results indicated that the benzene concentration in sample GW01 was out of compliance with the State standard. A second groundwater sample (GW02) was collected following additional soil excavation activities and was submitted for laboratory analysis of BTEX. Groundwater analytical results indicated that the benzene concentration in groundwater sample GW02 remained out of compliance with the State standard. Groundwater analytical data is presented in Table 2, and groundwater sample locations are illustrated on the attached Site Diagram. The laboratory 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 9  
Number of soil samples exceeding 910-1 2  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 1305

### NA / ND

-- Highest concentration of TPH (mg/kg) 4678  
NA Highest concentration of SAR           
BTEX > 910-1 Yes  
Vertical Extent > 910-1 (in feet) 15

### Groundwater

Number of groundwater samples collected 2  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 12'  
Number of groundwater monitoring wells installed 0  
Number of groundwater samples exceeding 910-1 2

-- Highest concentration of Benzene (µg/l) 2010  
ND Highest concentration of Toluene (µg/l)           
-- Highest concentration of Ethylbenzene (µg/l) 56  
-- Highest concentration of Xylene (µg/l) 869  
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?

Hydrocarbon impacted groundwater remains at the site. Groundwater monitoring wells will be installed to further assess the extent of groundwater impacts. The groundwater monitoring wells will be sampled on a quarterly basis and submitted for BTEX analysis until concentrations remain in full compliance with State standards for four consecutive quarters.

# REMEDIAL ACTION PLAN

## SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

A total of approximately 580 cubic yards (cy) of impacted soil were excavated and disposed. Approximately 460 cy were disposed at the Front Range Landfill in Erie, Colorado and 120 cy were disposed at the Kerr-McGee Land Treatment Facility in Weld County, Colorado. Minimal groundwater was encountered in the excavation and, therefore, not removed. The impacted soils were 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. The general site layout and excavation footprint are depicted on the attached Site Diagram.

## REMEDICATION 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 conclusion of soil remediation efforts, 200 pounds of Chemically Oxidized Granular Activated Carbon (COGAC) was added to the excavation and then the excavation was backfilled and returned to the original contours. Groundwater monitoring wells will be installed, and groundwater quality will be monitored on a quarterly basis until the results are below the COGCC Table 910-1 concentration levels for BTEX for four consecutive quarters. Estimated time to attain NFA is to be determined, and is based on the groundwater concentrations, the extent of the impacted groundwater and the efficacy of the selected remedial technologies.

## Soil Remediation Summary

In Situ

Ex Situ

Bioremediation ( or enhanced bioremediation )  
 Chemical oxidation  
 Air sparge / Soil vapor extraction  
 Natural Attenuation  
 Other \_\_\_\_\_

Yes  Excavate and offsite disposal  
If Yes: Estimated Volume (Cubic Yards) 580  
Name of Licensed Disposal Facility or COGCC Facility ID # 149007  
 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  
No  Natural Attenuation  
Yes  Other 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.

Groundwater monitoring wells will be installed at the site to further assess the extent of groundwater impacts and/or for remediation purposes. The groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with State standards for four consecutive quarters. A groundwater monitoring location figure illustrating the locations of the surveyed temporary monitoring wells will be provided in the eForm 27- Supplemental annual update.

# REMEDIATION 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:

A portion of the hydrocarbon impacted soils were taken to the the Kerr-McGhee Land Treatment facility.

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_ 580

E&P waste (solid) description Hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_ 149007

Non-COGCC Disposal Facility: \_\_\_\_\_

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

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

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

Non-COGCC Disposal Facility: \_\_\_\_\_

## 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 was restored to its pre-release grade. The Kerr-McGee production facility remains at the site.

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. 08/07/2018

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

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 08/03/2018

Date of commencement of Site Investigation. 08/03/2018

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

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 08/03/2018

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

### 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 Staff HSE Rep \_\_\_\_\_

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: \_\_\_\_\_

**COA Type****Description**

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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**

401829250	ANALYTICAL RESULTS
401829283	SITE MAP

Total Attach: 2 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)