

State of Colorado
Oil and Gas Conservation Commission

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Document Number:
401440393

Receive Date:

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	Phone Numbers
Address: P O BOX 173779		Phone: (720) 9294306
City: DENVER	State: CO	Zip: 80217-3779
Contact Person: Erik Mickelson	Email: erik.mickelson@anadarko.com	Mobile: ()

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: _____ Initial Form 27 Document #: 401440393

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 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: TANK BATTERY	Facility ID: 446053	API #: _____	County Name: WELD
Facility Name: TROUDT-61N67W 7SESE	Latitude: 40.059409	Longitude: -104.925300	
	** correct Lat/Long if needed: Latitude: 40.059361	Longitude: -104.925293	
QtrQtr: SESE	Sec: 7	Twp: 1N	Range: 67W
	Meridian: 6	Sensitive Area?	No

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Floodplain

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	Unknown	Sampling 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 October 11, 2017, historical impacts were discovered beneath the dump lines during P&A activities at this location. Due to the volume of impacted soil removed from the excavation, a reportable release was reported to the COGCC on October 13, 2017. Groundwater was encountered at 10 feet below ground surface in the excavation on October 13, 2017, and sample (GW01) was collected for BTEX analysis. Sample GW01 detected benzene at 214 ug/L exceeding COGCC Table 910-1 allowable concentrations. Toluene, ethylbenzene, and xylenes were detected below COGCC Table 910-1 allowable concentrations in sample GW01. After excavating approximately 200 cubic yards of soil and removing 100 barrels of groundwater, additional confirmation soil samples were collected and submitted for lab analysis. All confirmation soil samples collected from the excavation's extent were either not detectable at the lab's detection limits or below COGCC Table 910-1 allowable concentrations. On October 16, 2017, an additional groundwater sample was collected (GW02) and submitted for BTEX analysis. Sample GW02 detected benzene at 74.8 ug/L exceeding COGCC Table 910-1 allowable concentrations. Toluene, ethylbenzene, and xylenes were detected below COGCC Table 910-1 allowable concentrations in sample GW02. Prior to backfilling the excavation, 50 pounds of Chemically Oxygenated Granular Activated Carbon (COGAC) was applied to the groundwater. A summary of the soil and groundwater analytical results is provided in Tables 1 and 2, and the associated laboratory analytical reports are attached.

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):

Proposed Groundwater Sampling

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

Based on the analytical results from groundwater sample GW02, a subsurface assessment will be conducted at the facility to determine the extent of shallow groundwater impacts. A minimum of four monitoring wells will be installed in the source area, crossgradient, and downgradient of the excavation footprint. Groundwater monitoring will be conducted on a quarterly basis. Collected groundwater samples will be submitted for laboratory analysis of BTEX by USEPA Method 8260. Quarterly groundwater monitoring at the location will continue until BTEX concentrations remain below COGCC Table 910-1 groundwater standards for four consecutive quarters.

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 13
Number of soil samples exceeding 910-1 5
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 1392

NA / ND

-- Highest concentration of TPH (mg/kg) 3827
NA Highest concentration of SAR
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 0

Groundwater

Number of groundwater samples collected 2
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 10'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 2

-- Highest concentration of Benzene (µg/l) 214
-- Highest concentration of Toluene (µg/l) 254
-- Highest concentration of Ethylbenzene (µg/l) 261
-- Highest concentration of Xylene (µg/l) 2090
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?

A background sample was collected and placed on hold with the laboratory pending the results of the sidewall samples. The background sample was not analyzed due to the analytical results of the confirmation sidewall soil samples not exceeding COGCC Table 910-1 allowable concentrations. Both EC and pH concentrations detected in the soil samples were within the allowable limits with the exception of the base sample, which was collected below the designated root zone, having a pH of 9.48. A summary of the soil analytical results is provided in Table 1.

Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) 200 Volume of liquid waste (barrels) 100

Is further site investigation required?

Groundwater monitoring wells will be installed to delineate the dissolved-phase hydrocarbon plume. Quarterly groundwater monitoring will be conducted to determine the extent and magnitude of dissolved-phase hydrocarbon impacts. The need for future remediation activities will be based on the results from the groundwater assessment activities. A site map with the proposed monitoring well locations is attached as Figure 1.

REMEDIAL ACTION PLAN

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

On October 11, 2017, during P&A activities, historical impacts were discovered beneath the dump lines at this location. Approximately 200 cubic yards of impacted soil and 100 barrels of impacted groundwater were removed from this location. Soil samples collected from the excavation's final extent were either non-detect at laboratory detection limits or below COGCC Table 910-1 allowable concentrations. Prior to backfilling the excavation, 50 pounds of COGAC was applied to the groundwater. Additional remedial options will be reviewed once the extent and magnitude of the groundwater impacts are established through monitoring well installation and sampling.

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.

To support the hydrocarbon natural attenuation process for the remaining dissolved-phase impacts, 50 pounds of Chemically Oxygenated Granular Activated Carbon (COGAC) was applied to the groundwater prior to backfilling the excavation. In order to determine the extent and magnitude of the dissolved-phase hydrocarbon impacts, a minimum of four groundwater monitoring wells will be installed in the source area, crossgradient and downgradient of the excavation footprint in December 2017. Groundwater monitoring will be conducted on a quarterly basis and will continue until BTEX concentrations remain below COGCC Table 910-1 groundwater standards for four consecutive quarters. Based on the current groundwater data, it is estimated that NFA status can be obtained after four consecutive quarters of natural attenuation monitoring. A proposed monitoring well location map is attached as Figure 1.

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) _____ 200
Name of Licensed Disposal Facility or COGCC Facility ID # _____
_____ Excavate and onsite remediation
_____ Land Treatment
_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Other _____

Groundwater Remediation Summary

Bioremediation (or enhanced bioremediation)
Yes _____ Chemical oxidation
 Air sparge / Soil vapor extraction
 Natural Attenuation
 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.

To determine the extent and magnitude of impacts, a minimum of four groundwater monitoring wells will be installed in the source area, crossgradient, and downgradient of the excavation footprint. Groundwater monitoring will be conducted on a quarterly basis. Collected groundwater samples will be submitted for laboratory analysis of BTEX by USEPA Method 8260. Quarterly groundwater monitoring at the location will continue until BTEX concentrations remain below COGCC Table 910-1 groundwater standards for four consecutive quarters. A proposed monitoring well location map is attached as Figure 1.

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:

NA

Volume of E&P Waste (solid) in cubic yards _____ 200

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Front Range Landfill, Erie, CO

Volume of E&P Waste (liquid) in barrels _____ 100

E&P waste (liquid) description Hydrocarbon impacted water

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Kerr-McGee Aggregate Recycling Facility, Weld County, CO

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 excavation was backfilled with clean soil and graded to match the adjacent topography. Kerr-McGee tank battery and associated components were permanently removed from the facility location. Future reclamation activities at the facility location will be compliant with COGCC regulations.

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. 10/14/2017

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/11/2017

Date of commencement of Site Investigation. 10/11/2017

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 10/17/2017

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: Erik Mickelson

Title: Senior HSE Representative

Submit Date: _____

Email: erik.mickelson@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

<u>COA Type</u>	<u>Description</u>

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.

<u>Att Doc Num</u>	<u>Name</u>
401461688	MAP
401464000	ANALYTICAL RESULTS
401464001	ANALYTICAL RESULTS
401464002	ANALYTICAL RESULTS
401464004	ANALYTICAL RESULTS
401464008	ANALYTICAL RESULTS
401464010	ANALYTICAL RESULTS

Total Attach: 7 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)