

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9385 Initial Form 27 Document #: 200438211

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: SPILL OR RELEASE	Facility ID: 438253	API #: _____	County Name: WELD
Facility Name: SPILL/RELEASE POINT	Latitude: 40.189838	Longitude: -104.904904	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NESE	Sec: 29	Twp: 3N	Range: 67W
Meridian: 6	Sensitive Area? Yes		

SITE CONDITIONS

General soil type - USCS Classifications SW Most Sensitive Adjacent Land Use 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 850 feet east 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 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	15' (E-W) x 15' (N-S) x 19' bgs	Excavation, soil boring, 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 July 15, 2014, historical impacts were discovered during replacement of a partially-buried produced water vessel at the Warren 63N67W29NESE production facility. The facility was shut in, associated infrastructure removed, and excavation activities were initiated. Groundwater was not encountered during excavation activities. The COGCC has issued Spill/Release Point ID 438253 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 from the excavation as described in the Initial Form 27. Based on the data presented, constituent concentrations in the samples collected from the final lateral extent of the excavation were in full compliance with State standards. The benzene and TPH concentrations in base sample B01 @19' were out of compliance with the State standards. The excavation was not advanced below 19' bgs due to unstable soils. Borehole soil sampling was conducted on October 5, 2016 and February 23, 2018, to determine if soil impacts remained in the excavation area. Samples BH08@20-22', BH09@14', BH10@14' and BH11@14' were collected from the soils directly above the current (at the time) water table and submitted for laboratory analysis of BTEX and TPH. Analytical results indicated that constituent concentrations in these samples were in full compliance with State standards. Soil sample analytical data is presented in Table 1; soil sample locations are illustrated on Figures 1 & 2.

Proposed Groundwater Sampling

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

Groundwater samples were collected from temporary groundwater monitoring wells as described herein. Based on the data presented, hydrocarbon impacts to groundwater (and saturated soils below the current water table) were remediated to be in full compliance with State standards. Groundwater analytical data is presented in Table 2, and the temporary groundwater monitoring well locations are illustrated on Figure 3. The 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):

A partially-buried produced water vessel was removed during excavation activities. The depth to groundwater at the site has fluctuated significantly (from approximately 8 to 30 feet bgs) since excavation activities were completed, due to ongoing de-watering operations at the third-party gravel pit located south of the site.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 9

Number of soil samples exceeding 910-1 1

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 225

NA / ND

-- Highest concentration of TPH (mg/kg) 3127.2

NA Highest concentration of SAR

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 19

Groundwater

Number of groundwater samples collected 39

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 20'

Number of groundwater monitoring wells installed 8

Number of groundwater samples exceeding 910-1 3

-- Highest concentration of Benzene (µg/l) 66.1

-- Highest concentration of Toluene (µg/l) 7.4

-- Highest concentration of Ethylbenzene (µg/l) 32.4

-- Highest concentration of Xylene (µg/l) 235

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?

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.

On July 15, 2014, excavation activities commenced and approximately 290 cubic yards of impacted soil were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Laboratory analytical results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were in full compliance with State standards. The benzene and TPH concentrations in sample B01@19', collected from the base of the excavation, were out of compliance with the State standards. However, the excavation was not advanced below 19 feet bgs due to unstable soils. Additional soil boring and confirmation soil sampling activities were conducted on October 5, 2016, and February 23, 2018, to determine if soil impacts remained below the excavation area. Samples BH08@20-22', BH09@14', BH10@14', and BH11@14' were collected in the area of B01@19' from the soils directly above the current water table (at the time of drilling) and submitted to Origins Laboratory for analysis of BTEX and TPH. Analytical results received on October 10, 2016, and March 1, 2018, indicated that constituent concentrations in the confirmation soil samples were in full compliance with State standards. Groundwater was not encountered in the excavation; however, the depth to water has fluctuated significantly since excavation activities were completed and since July 2017 has consistently been above 19 feet bgs. As a result, the potential hydrocarbon impacts remaining below 19 feet bgs were evaluated through groundwater monitoring at well BH08, located within the footprint of the excavation area. Based on the results of confirmation soil and groundwater sampling conducted subsequent to excavation activities, the remaining hydrocarbon impacts below 19 feet bgs were successfully remediated to be in full compliance with State standards, via natural attenuation.

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.

Based on the analytical data presented herein, remediation is complete at this site and Kerr-McGee is requesting a No Further Action (NFA) determination for this release.

Soil Remediation Summary

☒ In Situ

No Bioremediation (or enhanced bioremediation)

No Chemical oxidation

No Air sparge / Soil vapor extraction

Yes Natural Attenuation

No Other _____

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 290

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

No 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.

Between March 27, 2015 and October 5, 2016, eight (8) temporary groundwater monitoring wells (BH01 through BH08) were installed at the site to assess the extent of groundwater impacts. These wells were sampled on a quarterly basis and submitted for laboratory analysis of BTEX. Analytical results for the groundwater samples collected from the temporary monitoring wells confirmed that constituent concentrations were in full compliance with State standards, or the wells were dry, for a minimum of four consecutive quarters. Temporary monitoring well locations are illustrated on Figure 3, and quarterly groundwater contour maps are presented on Figures 4, 5, 6, and 7.

REMEDATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Final Report

Report Type: ☐ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report

☒ Other NFA 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:

NA

Volume of E&P Waste (solid) in cubic yards 290

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 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? 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 site has been restored to its pre-release grade. Kerr-McGee's production facility has been rebuilt and remains on 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. _____

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/15/2014

Date of commencement of Site Investigation. 07/15/2014

Date of completion of Site Investigation. 02/23/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 07/15/2014

Date of completion of Remediation. 12/26/2017

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

As described, laboratory analytical data for the soil samples collected from the final lateral extent of the excavation were in full compliance with State standards. Samples BH08@20-22', BH09@14', BH10@14', and BH11@14' were subsequently collected in the area of B01@19', above the current water table at the time of sampling. Laboratory analytical data for these samples indicated that constituent concentrations were in full compliance with State standards, due to natural attenuation of hydrocarbon impacts following source removal. Laboratory analytical data for the groundwater samples collected from the temporary monitoring wells confirmed that constituent concentrations were in full compliance with State standards, or the wells were dry, for a minimum of four consecutive quarters. Soil analytical results are summarized in Table 1, and groundwater analytical results are summarized in Table 2. Excavation soil sample locations are illustrated on Figure 1, and borehole soil sample locations are illustrated on Figure 2. Temporary groundwater monitoring well locations are illustrated on Figure 3, and quarterly groundwater contour maps are presented on Figures 4, 5, 6, and 7. Laboratory analytical reports and temporary monitoring well completion diagrams are included as Attachments A and B, respectively. Based on the remediation activities completed at the site and the analytical results presented herein, Kerr-McGee is requesting a No Further Action (NFA) determination for this release.

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: 03/27/2018

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: 03/27/2018

Remediation Project Number: 9385

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**

401580193	FORM 27-SUPPLEMENTAL-SUBMITTED
401583039	SOIL SAMPLE LOCATION MAP
401583042	GROUND WATER SAMPLE LOCATION
401583048	ANALYTICAL RESULTS
401583054	ANALYTICAL RESULTS
401583056	ANALYTICAL RESULTS
401584575	LOGS
401586094	SOIL SAMPLE LOCATION MAP
401586808	GROUND WATER ELEVATION MAP

Total Attach: 9 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)