

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 INFORMATON

Name of Operator: <u>KERR MCGEE OIL & GAS ONSHORE LP</u>	Operator No: <u>47120</u>	Phone Numbers
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>Phillip Hamlin</u>	Email: <u>Phil.Hamlin@anadarko.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 4219 Initial Form 27 Document #: 1982321

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 Facilites (in accordance with Rule 909.c.)

Facility Type: <u>LOCATION</u>	Facility ID: <u>332589</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HSR-AUSTIN-64N66W 26SESE</u>	Latitude: <u>40.277120</u>	Longitude: <u>-104.736730</u>	
	** correct Lat/Long if needed: Latitude: <u>40.275952</u>	Longitude: <u>-104.743881</u>	
QtrQtr: <u>SESE</u>	Sec: <u>26</u>	Twp: <u>4N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

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

Is domestic water well within 1/4 mile? Yes 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

An occupied building and a water well are located approximately 300 feet northwest and groundwater is present approximately 6 feet below ground surface (bgs) at the site.

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 SAMPLES / LAB ANALYSIS
Yes	SOILS	50' N-S X 40' E-W X 10' BGS	SOIL SAMPLES / LAB 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.

HISTORICAL PETROLEUM HYDROCARBON IMPACTED SOIL WAS ENCOUNTERED WHILE FIELD CREWS WERE TYING NEW WELLS INTO THE TANK BATTERY. THE WELLS WERE SHUT IN AND PETROLEUM HYDROCARBON IMPACTED SOIL WAS EXCAVATED.

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 February 6, 2008, 6 confirmation soil samples were collected from the excavation sidewalls and submitted for total petroleum hydrocarbon (TPH) laboratory analysis by United States Environmental Protection Agency (USEPA) Method 8015. The analytical results confirmed that TPH concentrations were compliant with the Colorado Oil and Gas Conservation Commission (COGCC) sensitive area allowable level of 1,000 milligrams per kilogram (mg/kg) at the lateral extent of the excavation. Soil samples were not analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) as the samples were collected prior to the April 1, 2009, COGCC rule changes. The general site layout, excavation footprint, and soil sample locations are depicted on the Excavation Site Map provided as Figure 1. The excavation soil sample analytical results are summarized in Table 1.

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 at approximately 6 feet bgs. On February 6, 2008, a representative groundwater sample (EGW-01) was collected from the excavation and submitted for BTEX analysis by USEPA Method 8260B. Laboratory analytical results indicated that the benzene concentration exceeded COGCC Table 910-1 allowable levels for BTEX constituents at concentrations of 1,700 micrograms per liter (µg/L), 2,300 µg/L, 730 µg/L, and 11,000 µg/L, respectively. The groundwater sample location is depicted on the Excavation Site Map provided as Figure 1. The groundwater sample analytical results are summarized in Table 1.

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 6
Number of soil samples exceeding 910-1 0
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 2000

NA / ND

-- Highest concentration of TPH (mg/kg) 353
NA Highest concentration of SAR
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 0

Groundwater

Number of groundwater samples collected 245
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 5'
Number of groundwater monitoring wells installed 19
Number of groundwater samples exceeding 910-1 49

-- Highest concentration of Benzene (µg/l) 6300
-- Highest concentration of Toluene (µg/l) 2300
-- Highest concentration of Ethylbenzene (µg/l) 730
-- Highest concentration of Xylene (µg/l) 11000
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.

Based on excavation groundwater samples exceeding COGCC Table 910-1 allowable levels, approximately 36 barrels of impacted groundwater were removed from the excavation and transported to a licensed injection facility for disposal using a vacuum truck. 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 750 cubic yards of impacted soil were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado, for disposal. The general site layout and excavation footprint are depicted on the Site Map provided as Figure 2.

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.

Remediation details are presented in the attached Remediation Summary Report.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)	Yes	Excavate and offsite disposal
_____ Chemical oxidation		If Yes: Estimated Volume (Cubic Yards) _____ 750
_____ Air sparge / Soil vapor extraction		Name of Licensed Disposal Facility or COGCC Facility ID # _____
_____ Natural Attenuation	No	Excavate and onsite remediation
_____ Other _____		_____ Land Treatment
		_____ Bioremediation (or enhanced bioremediation)
		_____ Chemical oxidation
		_____ Other _____

Groundwater Remediation Summary

Yes _____ Bioremediation (or enhanced bioremediation)
No _____ Chemical oxidation
No _____ Air sparge / Soil vapor extraction
Yes _____ Natural Attenuation
Yes _____ Other _____ Groundwater Recovery

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 MW06 were installed at the site in March 2008. Groundwater monitoring continued on a quarterly basis. Field boring logs with well completion diagrams are attached.

Monitoring wells MW04, MW05, and MW06 were destroyed as of the July 2008 monitoring event. Replacement wells MW04R, MW05R, and MW06R were installed in October 2008 and subsequently destroyed as of the July 2009 monitoring event. Replacement wells MW04R2, MW05R2, and MW06R2 were installed in March 2010.

Between March 2010 and April 2015, seven temporary monitoring wells (TMW01 through TMW07) were installed. TMW01 was destroyed as of the June 2010 monitoring event. With COGCC approval, TMW02 through TMW06 were removed from the monitoring program in December 2012 as they were no longer needed as points of compliance. TMW02 was reincorporated into the monitoring program in April 2015. The monitoring well locations are depicted on Figure 2.

On November 4, 2013, monitoring wells MW01, MW02, MW03, MW04R2, and MW05R2 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 northwest. On February 10, 2017, temporary monitoring wells TMW02 and TMW07 were surveyed and tied into the November 2013 survey data. The survey data again indicated the groundwater flow direction at the site is to the northwest. Relative groundwater elevations are provided in Table 1. Groundwater Elevation Contour Maps for the first quarter 2016 through fourth quarter 2016 monitoring events are provided as Figures 3A through 3D.

As of the December 2016 quarterly monitoring event, BTEX concentrations in wells MW01, MW02, MW03, MW04R2, MW05R2, TMW02, and TMW07 are compliant with COGCC 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 NFA 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:

NA

Volume of E&P Waste (solid) in cubic yards 750

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

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Buffalo Ridge Landfill in Keenesburg, Colorado

Volume of E&P Waste (liquid) in barrels 36

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 SITE WAS RESTORED TO ITS PRE-RELEASE GRADE. KERR MCGEE'S PRODUCTION FACILITY REMAINS AT THE SITE.

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. _____

Actual Spill or Release date, if known. 02/01/2008

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/01/2008

Date of commencement of Site Investigation. 02/01/2008

Date of completion of Site Investigation. 04/29/2015

REMEDIAL ACTION DATES

Date of commencement of Remediation. 02/01/2008

Date of completion of Remediation. 12/28/2016

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: Phillip Hamlin

Title: Senior HSE Representative

Submit Date: 07/31/2017

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: PETER GINTAUTAS

Date: 08/01/2017

Remediation Project Number: 4219

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**

401203727	FORM 27-SUPPLEMENTAL-SUBMITTED
401204082	LOGS
401224697	ANALYTICAL RESULTS
401224699	OTHER
401359362	GROUND WATER ELEVATION MAP
401359380	SITE MAP
401359385	SOIL SAMPLE LOCATION MAP
401359528	REMEDIATION PROGRESS REPORT

Total Attach: 8 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)