

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 9302 Initial Form 27 Document #: 200437794

PURPOSE INFORMATION

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input checked="" 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 checked="" type="checkbox"/> Other <u>Request discontinuing the quarterly groundwater monitoring program</u>

SITE INFORMATION N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>446224</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>PLATTE 26-2</u>	Latitude: <u>40.259112</u>	Longitude: <u>-104.855170</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWNE</u>	Sec: <u>2</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 GC Most Sensitive Adjacent Land Use Rangeland

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

Water well approximately 160 feet (ft) east, surface water and wetlands located approximately 290 ft southwest, and groundwater approximately 3 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 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
Yes	SOILS	30ft N-S x 65ft E-W x 4ft 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.

In February 2013, a drain valve on the back of the oil tank at the Clack 1-2A, Olson 2-2 facility froze and ruptured. Approximately 16 barrels (bbls) of condensate and 15 bbls of produced water were released within the tank battery containment berm, which was lined with a geosynthetic Claymax® liner. The remaining condensate and produced water were removed from the leaking tank. A vacuum truck was used to recover approximately 10 bbls of condensate from within the tank battery containment berm.

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 August 4 and 6, 2015, a subsurface site assessment was conducted to determine if soil outside the secondary containment had been impacted. Eight assessment soil borings (SB01 through SB08) were advanced around the tank battery, and two 45-degree angle soil borings (UTSB01 West and UTSB02 East) were advanced under the two aboveground storage tanks within the containment. The soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons (TPH). The laboratory analytical results indicated that benzene and/or TPH concentrations exceeded the Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 allowable levels beneath the tanks within the lined containment. BTEX and TPH concentrations were in full compliance with COGCC Table 910-1 allowable levels outside of the containment. The soil boring locations are depicted on Figure 1. The 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):

On August 4 and 6, 2015, assessment soil borings SB01 through SB08 were completed as monitoring wells MW01 through MW08, respectively. Groundwater monitoring has been conducted on a quarterly basis since August 2015.

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 15
Number of soil samples exceeding 910-1 2
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 1950

NA / ND

-- Highest concentration of TPH (mg/kg) 1750
NA Highest concentration of SAR
BTEX > 910-1 Yes
Vertical Extent > 910-1 (in feet) 3

Groundwater

Number of groundwater samples collected 120
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 3'
Number of groundwater monitoring wells installed 8
Number of groundwater samples exceeding 910-1 16

-- Highest concentration of Benzene (µg/l) 1100
ND Highest concentration of Toluene (µg/l)
-- Highest concentration of Ethylbenzene (µg/l) 29.4
-- Highest concentration of Xylene (µg/l) 279
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?

The August 2015 site assessment indicated that soil outside of the lined containment was in full compliance with COGCC Table 910-1 allowable levels. It is estimated that approximately 52 cubic yards of residual impacted soil remain in place beneath the two aboveground storage tanks and above the Claymax® liner. The impacted soil in place will be assessed on an annual basis via additional 45-degree angle soil borings beneath the aboveground storage tanks. Soil samples will be collected from the soil borings and submitted for laboratory analysis of BTEX, TPH, pH, and specific conductivity. The soil assessment results will be provided to the COGCC in annual supplemental Form 27s, until a request for No Further Action is warranted.

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 80 cubic yards of petroleum hydrocarbon impacted soil were removed from within the lined containment to the depth of the geosynthetic Claymax® liner on the south side of the containment to accommodate the installation of a product recovery system, as described under the Remediation Summary section. The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling. Approximately 52 cubic yards of residual impacted soil remain in place beneath the aboveground storage tanks within the Claymax® liner.

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.

In March 2013, a product recovery system was constructed. The recovery system consists of two 3-inch recovery wells with 1-inch polyvinyl chloride (PVC) recovery pipes installed horizontally above the geosynthetic Claymax® liner. Approximately 10 gallons of product were removed from the two PVC recovery wells. Based on diminishing product recovery, efforts were discontinued in July 2014. The recovery wells are depicted on Figure 1.

Soil Remediation Summary

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> Ex Situ
_____ Bioremediation (or enhanced bioremediation)	Yes _____ Excavate and offsite disposal
_____ Chemical oxidation	_____ If Yes: Estimated Volume (Cubic Yards) _____ 80
_____ Air sparge / Soil vapor extraction	_____ Name of Licensed Disposal Facility or COGCC Facility ID # _____ 149007
_____ Natural Attenuation	No _____ Excavate and onsite remediation
_____ Other _____	_____ 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
Yes _____	Other _____ Product Recovery (Above the Geosynthetic Claymax® Liner)

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.

Assessment soil borings SB01 through SB08 were completed as monitoring wells MW01 through MW08, respectively, in August 2015. Groundwater monitoring continued on a quarterly basis. The monitoring well locations are depicted on Figure 2. Boring logs with monitoring well completion diagrams are attached.

On August 5, 2015, monitoring wells MW01 through MW07 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 west. On April 11, 2018, monitoring well MW08 was tied into the survey data. The survey data indicated the groundwater flow direction at the site is to the west. Relative groundwater elevations are provided in Table 2. Groundwater Elevation Contour Maps for the second quarter 2018 through first quarter 2019 monitoring events are provided as Figures 3A through 3D, respectively.

As of the February 2019 quarterly monitoring event, BTEX concentrations in monitoring wells MW01 through MW08 were in full compliance with COGCC Table 910-1 allowable levels for four consecutive quarterly monitoring events. Based on the soil and groundwater data to date, the impacted soil in place above the liner has not contributed impacts to the groundwater. Therefore, Kerr-McGee requests to discontinue the quarterly groundwater monitoring program. Groundwater monitoring wells MW01 through MW08 will be abandoned following approval of this Form 27 Supplemental. 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 _____

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

Other Request discontinuing the quarterly groundwater monitoring program _____

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. The recovered condensate from the product recovery system was transported to the Oil Polishing Facility for reuse.

Volume of E&P Waste (solid) in cubic yards _____ 80

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 _____ 1

E&P waste (liquid) description _____ 10 gallons of condensate from product recovery system (July 2014)

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____ Oil Polishing Facility

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No _____

Do all soils meet Table 910-1 standards? No _____

Does the previous reply indicate consideration of background concentrations? _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? No _____

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 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. _____

Actual Spill or Release date, if known. 02/13/2013

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/13/2013

Date of commencement of Site Investigation. 08/05/2015

Date of completion of Site Investigation. 08/17/2015

REMEDIAL ACTION DATES

Date of commencement of Remediation. 02/13/2013

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 Environmental Rep. _____

Submit Date: 04/16/2019 _____

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: 04/16/2019 _____

Remediation Project Number: 9302 _____

COA Type**Description**

	<p>the groundwater monitoring portion of this remediation and site investigation plan is considered closed based on the data submitted over the last year. Soils beneath in place tanks are still above thresholds in Tabl 910-1 and the soil portion of the site investigation and remediation plan will continue.</p> <p>Submit reports of site investigation and progress of remediation including results of sampling and analysis on an annual basis or more often until remediation is closed.</p>
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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**

401940522	FORM 27-SUPPLEMENTAL-SUBMITTED
401941234	LOGS
401945333	ANALYTICAL RESULTS
401951672	SOIL SAMPLE LOCATION MAP
401951674	SITE MAP
401955102	GROUND WATER ELEVATION MAP

Total Attach: 6 Files

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

Environmental	to draft at request of operator	03/12/2019
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Total: 1 comment(s)