

State of Colorado
Energy & Carbon Management Commission

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Taylor Robinson

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 ECOM 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.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATION

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>(713) 350-4906</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80217-3779</u>		Mobile: <u>()</u>
Contact Person: <u>Ariana Ochoa</u>	Email: <u>DJRemediation_Forms@oxy.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 29090 Initial Form 27 Document #: 403378231

PURPOSE INFORMATION

- Rule 913.c.(1): Pit or Cuttings Trench closure.
- Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- Rule 913.g: Changes of Operator.
- Rule 915.b: Request to leave elevated inorganics in situ.
- Other: _____

SITE INFORMATION

Yes Multiple Facilities

Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-15304</u>	County Name: <u>WELD</u>
Facility Name: <u>FOUR RAITH UNIT 1</u>	Latitude: <u>40.234950</u>	Longitude: <u>-104.759890</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSE</u>	Sec: <u>10</u>	Twp: <u>3N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>484643</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Four Raith Unit 1 Wellhead</u>	Latitude: <u>40.234950</u>	Longitude: <u>-104.759890</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSE</u>	Sec: <u>10</u>	Twp: <u>3N</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? Yes

Is groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Domestic water well: approximately 990' SE
Surface water: approximately 1300' E
Wetlands: none
Springs: none
Livestock: none
Occupied Building: none
High Priority Habitats: none

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- E&P Waste Other E&P Waste Non-E&P Waste
- Produced Water Workover Fluids
- Oil Tank Bottoms
- Condensate Pigging Waste
- Drilling Fluids Rig Wash
- Drill Cuttings Spent Filters
- Pit Bottoms
- Other (as described by EPA) _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
UNDETERMINED	GROUNDWATER	TBD	Groundwater samples/laboratory analytical results
Yes	SOILS	85' (N-S) x 70' (E-S) x 20' bgs	Inspection/soil samples/laboratory analytical 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.

Wellhead cut and cap operations and flowline removal activities were completed at the Four Raith Unit 1 wellhead on June 20 through December 12, 2023. Groundwater was encountered in the wellhead excavation area at approximately 19' below ground surface (bgs). Visual inspection and field screening of soils around the well, associated pumping equipment, and flowline potholes following wellhead cut and cap operations and flowline removal activities were conducted and soil samples (WH--B01@8', WH--S01@7', WH-W01@7', FL-B01@4', FL-B02@5') were submitted for laboratory analysis to determine if a release occurred. Laboratory analytical results indicated that the benzene, TPH, naphthalene, 1,2,4-TMB, 1,3,5-TMB, pH, SAR, boron, 1 and 2 methyl-naphthalene, fluorene, arsenic, and cadmium concentrations in soil samples WH-B01@8' and FL-B01@4' exceeded the applicable ECMC Table 915-1 standards and site-specific background limits. As such, a Form 19-Initial/Supplemental Spill/Release Report (ECMC Document No. 403441220) was submitted on June 22, 2023, and the ECMC issued spill/Release Point ID 484643. A topographic Site Location Map showing the geographic setting of the site location is provided as Figure 1. Soil sample location and field screening data are presented in Table 1. The soil sample and field screening locations are illustrated on Figures 2 and 5. The laboratory analytical reports are provided as Attachment A. The field notes and a photographic log are provided as Attachment B.

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 December 12, 2023 through April 9, 2024, excavation activities were conducted to address remaining soil impacts at the former wellhead location (WH-B01@8') and seventeen (17) confirmation soil samples were collected from the base and sidewalls of the final excavation extent, at depths ranging from 6' to 20' bgs. Based on the waste characterization results (WH-B01@8'), the confirmation soil samples were submitted for laboratory analysis of benzene, ethylbenzene, total xylenes, TPH, TMBs, pH, SAR, boron, metals, and PAHs using ECMC-approved methods. Analytical results indicate that benzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, 1 and 2-methylnaphthalene, arsenic, lead, and selenium impacts remain in the excavation area. However, the remaining impacts will be left in-place due to the presence of groundwater within the excavation and will be addressed through quarterly groundwater monitoring.

Proposed Groundwater Sampling

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

Groundwater was encountered in the wellhead excavation area at approximately 19' bgs. On April 8, 2024, a groundwater sample GW-01 was collected from the excavation area and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4- and 1,3,5-TMB, by USEPA Method 8260D as approved in the Form 27-Initial (Document No. 403378231). Groundwater analytical results indicated that constituent concentrations in sample GW-01 were in compliance with ECMC Table 915-1 standards for organic constituents as summarized in Table 6. The groundwater sample location is illustrated on Figure 4. Given that groundwater was in contact with soil exceeding Table 915-1 and the remaining soil impacts, monitoring wells will be installed at the site and sampled for four consecutive quarters to monitor for groundwater compliance. Future groundwater samples will be submitted for the ECMC Table 915-1 groundwater analytical suite, as well as 1 and 2-methylnaphthalene and dissolved arsenic, lead, and selenium.

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):

On June 20 through December 12, 2023, visual inspection and field screening of soils was conducted at two sidewall locations within the wellhead excavation area, four locations at the ground surface adjacent to the excavation, and seven flowline removal potholes. Based on the inspection and screening results, no soil samples were submitted from these areas in accordance with ECMC Operator Guidance. On July 7, 2023, a soil gas survey was conducted at three soil vapor points (SVP-03 - SVP-05) installed adjacent to the former wellhead. Soil vapor points SVP-01 and SVP-02 were unable to be screened as the wellhead excavation was backfilled. GEM 5000 readings were non-detect for methane at all three SVPs. SVP locations are illustrated on Figure 2 and SVP screening results are presented in Table 7.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 57

Number of soil samples exceeding 915-1 56

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 5950

NA / ND

-- Highest concentration of TPH (mg/kg) 2320

-- Highest concentration of SAR 12.3

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 20

Groundwater

Number of groundwater samples collected 1

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 19

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l) _____

ND Highest concentration of Toluene (µg/l) _____

ND Highest concentration of Ethylbenzene (µg/l) _____

ND Highest concentration of Xylene (µg/l) _____

NA Highest concentration of Methane (mg/l) _____

Surface Water

0 Number of surface water samples collected

 Number of surface water samples exceeding 915-1

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?

Background soil samples WH-BG01 - WH-BG12 were collected from native material -adjacent to the wellhead cut and cap excavation at depths ranging from 3' to 20' bgs. The background soil samples were submitted for laboratory analysis of the Soil Suitability for Reclamation Parameters and Table 915-1 metals using standard methods appropriate for detecting the target analytes in Table 915-1. Analytical results for the background soil samples are presented in Tables 3 and 5. The background sample locations are illustrated on Figures 2 through 4.

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?

Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil impacts. A background groundwater sample will be collected and submitted for laboratory analysis of TDS, sulfate ions, and chloride ions to establish background levels.

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.

Between December 12, 2023 - April 9, 2024, approximately 2,300 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill located in Keenesburg, Colorado for disposal. Laboratory analytical results indicate that benzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, 1-methylnaphthalene, 2-methylnaphthalene, arsenic, lead, and selenium concentrations exceeding ECMC Table 915-1 standards and site-specific background limits remain at the site. However, the remaining impacts will be left in-place due to the presence of groundwater within the excavation, and will be addressed through quarterly groundwater monitoring. The excavation areas will be backfilled and contoured to match pre-existing conditions.

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.

Laboratory analytical results indicate that benzene, naphthalene, 1,2,4-TMB, 1,3,5-TMB, 1-methylnaphthalene, 2-methylnaphthalene, arsenic, lead, and selenium concentrations exceeding ECMC Table 915-1 standards and site-specific background limits remain at the site. However, the remaining impacts will be left in-place due to the presence of groundwater within the excavation, and will be addressed through quarterly groundwater monitoring. Prior to backfilling, approximately 150 pounds of WPX® activated carbon and approximately 70 pounds of COGAC-pH® activated carbon were added to the groundwater within the excavation area, to mitigate remaining hydrocarbon impacts in groundwater. The SDS forms for the activated carbon are provided in Attachment C. Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining groundwater impacts. Based on the remaining impacts in the wellhead excavation area, the groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of the ECMC Table 915-1 groundwater analytical suite, as well as 1 and 2-methylnaphthalene, and dissolved arsenic, lead and selenium. Estimated time to attain NFA is TBD based on the groundwater concentrations, the extent of impacted groundwater, and the efficacy of the selected remedial technologies.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) 2300

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or ECMC Facility ID # _____

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ Land Treatment

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Other _____

Groundwater Remediation Summary

_____ Bioremediation (or enhanced bioremediation)

_____ 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.

Given the remaining soil impacts within the wellhead excavation area, and that groundwater was in contact with soil exceeding Table 915-1 standards, temporary monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil impacts. Based on the remaining impacts to soil in the wellhead excavation area, the temporary groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of the ECMC Table 915-1 groundwater analytical suite, as well as 1-methylnaphthalene, 2-methylnaphthalene, dissolved arsenic, lead and selenium. A groundwater monitoring location figure illustrating the locations of the surveyed monitoring wells will be provided in a Form 27-Supplemental update.

Does Groundwater meet Table 915-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

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 will be reclaimed in accordance with ECMC 1000 Series Reclamation Rules.

Is the described reclamation complete? _____

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

Interim

Final

Did the Surface Owner provide the seed mix? _____

If YES, does the seed mix comply with local soil conservation district recommendations? _____

Did the local soil conservation district provide the seed mix? _____

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. _____

Proposed date of completion of Reclamation. _____

IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 03/01/2023

Actual Spill or Release date, or date of discovery. 06/21/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/20/2023

Proposed site investigation commencement. 06/20/2023

Proposed completion of site investigation. 10/31/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 06/21/2023

Proposed date of completion of Remediation. 10/31/2025

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

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: Ariana Ochoa

Title: Sr. HSE Advisor

Submit Date: 08/30/2024

Email: DJRemediation_Forms@oxy.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Taylor Robinson

Date: 10/23/2024

Remediation Project Number: 29090

COA Type**Description**

0 COA	

ATTACHMENT 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**

403837529	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403852441	PHOTO DOCUMENTATION
403852443	SITE MAP
403852445	SOIL SAMPLE LOCATION MAP
403852446	SOIL SAMPLE LOCATION MAP
403852449	SOIL SAMPLE LOCATION MAP
403852451	ANALYTICAL RESULTS
403852684	SAFETY DATA SHEETS
403857001	SOIL SAMPLE LOCATION MAP
403894957	ANALYTICAL RESULTS
403967987	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 11 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)