FORM 27 Rev 5/22

State of Colorado
Energy & Carbon Management Commission

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Report taken by: Kari Brown

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 ECMC 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 INFORMATON

Name of Operator: KERR MCGEE OIL & GAS ONSHORE LP Operator No: 47120
Address: P O BOX 173779
City: DENVER State: CO Zip: 80217-3779
Contact Person: Macy Kiel

Phone Numbers
Phone: (970) 515-1110
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PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 28966 Initial Form 27 Document #: 403361328

PURPOSE INFORMATION

- [ ] Rule 913.c.(1): Pit or Cuttings Trench closure.
- [X] Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- [X] 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.
- [X] 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: TANK BATTERY Facility ID: 470881 API #: County Name: WELD
Facility Name: UPRR 42 PanAm R True 1 battery Latitude: 40.128609 Longitude: -104.785728
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NENW Sec: 21 Twp: 2N Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE Facility ID: 486008 API #: County Name: WELD
Facility Name: Mullet 6-21A/UP42 O SA Latitude: 40.128609 Longitude: -104.785728
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NENW Sec: 21 Twp: 2N Range: 66W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications: SC

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: multiple domestic wells within 1/4 mile
Surface water: multiple surface water features within 1/4 mile
Wetland: none
Spring: none
Livestock: none
Occupied Building: multiple occupied buildings within 1/4 mile
High Priority Habitats: none

SITE INVESTIGATION PLAN

TYPE OF WASTE:

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

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
UNDETERMINED	GROUNDWATER	TBD	Groundwater samples/laboratory analytical results
Yes	SOILS	TBD	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.

Facility decommissioning activities were completed at the Mullet 6-21A,UP42 O SA location on August 4, 2023. Groundwater was encountered within the excavation areas at approximately 6' below ground surface (bgs). Visual inspection and field screening of soils at one separator, one meter house, one produced water vessel (PWV), one emission control device (ECD), and one aboveground storage tank (AST) was conducted following removal activities, and soil samples (SEP-B01@4', SEP-B02@4', PW-B01@6', PW-N01@3', and AST-B01@3") were submitted for laboratory analysis to determine if a release occurred. In addition, during reclamation activities that commenced on January 31, 2024, two waste characterization samples were collected and submitted for laboratory analysis. Laboratory analytical results indicated that soil sample AST-B01@3" contained pH concentration and soil samples REC Waste Characterization-01@1' and REC Waste Characterization-02@1' contained TPH, naph., TMBs, pH, SAR, 1 and 2 methylnaphthalene, arsenic, barium, and lead concentrations exceeding the applicable ECMC Table 915-1 standards and background concentrations. As such, a Form 19-Initial Spill/Release Report (ECMC Document No. 403675718) was submitted on February 5, 2024, and the ECMC issued Spill/Release Point ID 486008. 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 through 5. The laboratory analytical reports are provided as Attachment A. The field notes and a photographic log are provided as Attachment B. Soil and groundwater analytical results are summarized in Tables 2 through 6.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[X] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

From August 4, 2023, through August 22, 2024, confirmation and verification soil samples were collected from the base and sidewalls of the multiple excavation extents ranging at depths of approximately 4' to 20' bgs. Based on waste characterization results (REC Waste Characterization-02@1' and DL-B12@5'), soil samples were submitted for laboratory analysis of BTEX, TPH, naphthalene, TMBs, pH, SAR, boron, PAHs, and/or ECMC Table 915-1 metals using ECMC approved methods. Analytical results received indicate that organic and inorganic soil impacts remain in the excavation area. However, due to the presence of groundwater, excavation activities are unable to safely continue. Additional samples will be collected during monitoring well installation to vertically and laterally delineate the remaining soil and potential groundwater impacts. Following receipt of analytical data from delineation activities, KMOG will propose a remedial plan in a forthcoming Form 27-Supplemental Update.

Proposed Groundwater Sampling

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

Groundwater was encountered in the excavation areas at approximately 6' bgs. On August 16, 2023, and January 25, June 5, June 28, and August 22, 2024, groundwater samples GW-01 through GW-05 were collected from the excavation areas 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. 403361328). Analytical results indicate that the groundwater samples were compliant with the ECMC Table 915-1 standards or organics as summarized in Table 6. The groundwater sample locations are illustrated in Figures 2 and 3. Monitoring wells will be installed at the site and sampled for the ECMC Table 915-1 groundwater analytical suite.

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):

From August 4, 2023, through March 29, 2024, visual inspections and field screening of soils was conducted at three sidewalls of the PWV excavation, one ECD, one former meter house, and one former AST location. Based on the inspection and screening results, hydrocarbon-impacted soils were not observed at the soil screening locations. As a result, no soil samples were submitted for laboratory analysis from these areas in accordance with the ECMC Operator Guidance for Oil & Gas Facility Closure document.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected: 184
Number of soil samples exceeeding 915-1: 175
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet): 36000

NA / ND

-- Highest concentration of TPH (mg/kg): 6560
-- Highest concentration of SAR: 59.8
BTEX > 915-1: Yes
Vertical Extent > 915-1 (in feet): 20

Groundwater

Number of groundwater samples collected: 5
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet): 6
Number of groundwater monitoring wells installed: 0
Number of groundwater samples exceeding 915-1: 0

-- Highest concentration of Benzene (µg/l): 1.49
ND Highest concentration of Toluene (µg/l):
-- Highest concentration of Ethylbenzene (µg/l): 10.4
-- Highest concentration of Xylene (µg/l): 153
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 PW-BG01 - PW-BG05 collected from depths ranging from 3 to 15 feet bgs, REC-BG02@1', REC-BG03@1', and AST-BG01@3" - AST-BG03@3" were collected from native material within non-impacted areas near the facility The background soil samples were submitted for laboratory analysis of the Soil Suitability for Reclamation Parameters and ECMC Table 915-1 metals using standard methods appropriate for detecting target analytes in Table 915-1. Analytical results for the background soil samples are presented in Tables 3 and 5. Background sample locations are illustrated on Figure 5. Additional site-specific background samples will be collected to further assess the remaining pH, SAR, and metal exceedances in multiple soil samples.

☐ 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?

Additional delineation activities and collection of additional background samples are ongoing to assess the remaining soil impacts. Following receipt of analytical data from delineation and additional background sampling activities, KMOG will propose a remedial plan in a forthcoming Form 27-Supplemental Update. Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil impacts and to monitor for groundwater compliance. A background groundwater sample will be collected and submitted for laboratory analysis of TDS, sulfate ions, and chloride ions to establish background levels. Based on the remaining soil impacts in the former PWV excavation area, 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, benzo(a)anthracene, and dissolved metals (As, Ba, Ca, Lb, Ni, and Se) based on final analytical results.

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 August 4, 2023, through August 22, 2024, approximately 27,680 cubic yards of impacted material were excavated and transported to the Front Range Landfill located in Erie, Colorado for disposal. Approximately 303 cubic yards of impacted slurry were removed from the excavation area via vacuum truck
and transported to the Kerr-McGee Aggregate Recycle Facility for recycling. Approximately 2,480 barrels of impacted groundwater were removed from the excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility for recycling. Laboratory analytical results indicate that organic and inorganic soil impacts exceeding ECMC Table 915-1 standards and site-specific background limits remain at the site. However, Kerr-McGee is requesting the Director's approval to delineate remaining soil impacts during monitoring well installation activities and assess groundwater compliance through quarterly groundwater monitoring. Following receipt of analytical data from delineation activities, KMOG will propose a remedial plan in a forthcoming Form 27-Supplemental Update. The excavation areas will be backfilled and contoured to match pre-existing conditions.

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.

Laboratory analytical results indicate that organic and inorganic impacts exceeding ECMC Table 915-1 standards and site-specific background limits remain at the site. Additional site-specific background samples will be collected to further access metal concentrations in native soil. Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil and groundwater impacts. Following receipt of analytical data from delineation activities, KMOG will propose a remedial plan in a forthcoming Form 27-Supplemental Update. Based on the remaining impacts in the excavation areas, 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. 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**

- ____ 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) 27983
  - Name of Licensed Disposal Facility or ECMC Facility ID # 434766
- ____ 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
- Yes Other Groundwater removal

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.

Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil and groundwater impacts. Groundwater monitoring wells will be sampled and submitted for laboratory analysis of the ECMC Table 915-1 groundwater analytical suite. A groundwater monitoring location figure illustration the locations of the surveyed monitoring wells will be provided in a Form 27-Supplemental update.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

[X] Quarterly [ ] Semi-Annually [ ] Annually [ ] Other

[ ] **Request Alternative Reporting Schedule:**

[ ] Semi-Annually [ ] Annually [ ] Other

Rule 913.e:
After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

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

[ ] Other

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).
If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

KMOG has sufficient insurance and bonding to fully address the anticipated costs of remediation, including the remaining estimated costs for this project. KMOG currently has over 40 million in bonds with the Colorado Oil and Gas Conservation Commission. The cost for remediation is a preliminary estimate only, costs may change upwards or downward based on site-specific information. KMOG makes no representation or guarantees as to the accuracy of the preliminary estimate.

Operator anticipates the remaining cost for this project to be: $ 25000

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:

Approximately 303 cubic yards of impacted slurry were removed from the excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility for recycling. Approximately 2,480 barrels of impacted groundwater were removed from the excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility for recycling.

Volume of E&P Waste (solid) in cubic yards 27983

E&P waste (solid) description impacted soil

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Front Range Landfill located in Erie, Colorado

Volume of E&P Waste (liquid) in barrels 2480

E&P waste (liquid) description groundwater

ECMC Disposal Facility ID #, if applicable: 434766

Non-ECMC Disposal Facility:

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

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

If YES:

[ ] Compliant with Rule 913.h.(1).

[ ] Compliant with Rule 913.h.(2).

[ ] Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards?

Does the previous reply indicate consideration of background concentrations?

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. 07/28/2022

Actual Spill or Release date, or date of discovery. 02/02/2024

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 08/04/2023

Proposed site investigation commencement. 08/04/2023

Proposed completion of site investigation. 03/31/2026

REMEDIAL ACTION DATES

Proposed start date of Remediation. 02/02/2023

Proposed date of completion of Remediation. 03/31/2026

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

In response the comment on the previously denied Form 27-Supplemental (Document #403866650), due to safety limitations KMOG is proposing to delineate the remaining soil impacts during monitoring well installation activities and assess groundwater compliance through groundwater monitoring. Additional site-specific background samples will be collected to further access pH, SAR, and metal concentrations in native soil. Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil and groundwater impacts. Following receipt of analytical data from delineation activities, KMOG will propose a remedial plan in a forthcoming Form 27-Supplemental Update.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Macy Kiel Title: Environmental Engineer

Submit Date: 11/20/2024 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: Kari Brown Date: 01/30/2025

Remediation Project Number: 28966

COA Type	Description
	Re-samples/verification samples of organic exceedances are not considered valid. Operator shall remediate soils in the vicinity of impacts.
1 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
403991202	FORM 27-SUPPLEMENTAL-SUBMITTED
403991284	PHOTO DOCUMENTATION
403991293	SITE MAP
403991296	ANALYTICAL RESULTS
403991297	ANALYTICAL RESULTS
403991298	ANALYTICAL RESULTS
403991299	ANALYTICAL RESULTS
403991300	ANALYTICAL RESULTS
403991313	ANALYTICAL RESULTS
403992734	SOIL SAMPLE LOCATION MAP
403992745	SOIL SAMPLE LOCATION MAP
403992761	SOIL SAMPLE LOCATION MAP
403992767	SOIL SAMPLE LOCATION MAP
403992769	ANALYTICAL RESULTS
403992801	ANALYTICAL RESULTS
403992802	ANALYTICAL RESULTS
403992803	ANALYTICAL RESULTS
403992805	ANALYTICAL RESULTS
403992806	ANALYTICAL RESULTS
403992807	ANALYTICAL RESULTS
403992809	ANALYTICAL RESULTS
403992812	ANALYTICAL RESULTS
403992823	ANALYTICAL RESULTS
403992825	ANALYTICAL RESULTS

403992831	ANALYTICAL RESULTS
403992837	ANALYTICAL RESULTS
403992841	ANALYTICAL RESULTS
403992845	ANALYTICAL RESULTS
403992867	ANALYTICAL RESULTS

Total Attach: 29 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)