

State of Colorado  
Energy & Carbon Management Commission

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Document Number:  
403905013  
Receive Date:  
08/30/2024

Report taken by:  
Candice (Nikki) Graber

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 INFORMATION

Name of Operator: <u>KERR MCGEE OIL &amp; GAS ONSHORE LP</u>	Operator No: <u>47120</u>	<b>Phone Numbers</b>
Address: <u>P O BOX 173779</u>		Phone: <u>(720) 929-4306</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80217-3779</u>		Mobile: <u>( )</u>
Contact Person: <u>Erik Mickelson</u>	Email: <u>DJRemediation_Forms@oxy.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 22016 Initial Form 27 Document #: 402957537

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>123-31521</u>	County Name: <u>WELD</u>
Facility Name: <u>COTTONWOOD 11-33</u>	Latitude: <u>40.092354</u>	Longitude: <u>-104.788414</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>33</u>	Twp: <u>2N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-31526</u>	County Name: <u>WELD</u>
Facility Name: <u>COTTONWOOD 12-33</u>	Latitude: <u>40.092288</u>	Longitude: <u>-104.788496</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>33</u>	Twp: <u>2N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: WELL	Facility ID: _____	API #: 123-31541	County Name: WELD
Facility Name: COTTONWOOD 33-33		Latitude: 40.092253	Longitude: -104.788545
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSW	Sec: 33	Twp: 2N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL	Facility ID: _____	API #: 123-31542	County Name: WELD
Facility Name: COTTONWOOD 32-33		Latitude: 40.092331	Longitude: -104.788446
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSW	Sec: 33	Twp: 2N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL	Facility ID: _____	API #: 123-31544	County Name: WELD
Facility Name: COTTONWOOD 13-33		Latitude: 40.092309	Longitude: -104.788471
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSW	Sec: 33	Twp: 2N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL	Facility ID: _____	API #: 123-31548	County Name: WELD
Facility Name: COTTONWOOD 34-33		Latitude: 40.092272	Longitude: -104.788518
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSW	Sec: 33	Twp: 2N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: FLOWLINE	Facility ID: 417179	API #: _____	County Name: WELD
Facility Name: COTTONWOOD TANK BATTERY 12-33		Latitude: 40.089717	Longitude: -104.788849
		** correct Lat/Long if needed: Latitude: 40.089843	Longitude: -104.788764
QtrQtr: SWSW	Sec: 33	Twp: 2N	Range: 66W Meridian: 6 Sensitive Area? Yes

**SITE CONDITIONS**

General soil type - USCS Classifications SW \_\_\_\_\_ Most Sensitive Adjacent Land Use Non-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**

Multiple buildings and livestock holding pens are located within ¼ mile of the wellheads.  
 The nearest building is located approximately 960 feet northwest of the wellheads.  
 The nearest domestic water well is located approximately 1,180 feet south of the wellheads.  
 Surface water is located approximately 1,020 feet southeast of the wellheads.  
 A wetland is located approximately 840 feet southeast of the wellheads.

**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 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
UNDETERMINED	GROUNDWATER	TBD	Inspection/soil samples/laboratory analytical results
UNDETERMINED	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.

Wellhead cut and cap operations were completed at the Cottonwood 11, 12, 13, 32, 33, 34-33 wellheads on March 4, 2022. Groundwater was not encountered in the wellhead cut and cap excavation area. Visual inspection and field screening of soils around the wells and associated pumping equipment was conducted following cut and cap operations, and soil samples (11-33-WH-B01@6', 12-33-WH-B01@6', 13-33-WH-B01@6', 32-33-WH-B01@6', 33-33-WH-B01@6', and 34-33-WH-B01@6') were submitted for laboratory analysis to determine if a release occurred. The flowlines associated with these wellheads were removed on April 14 through 21, 2022. Soil samples were collected from the locations where the flowline risers were disconnected at the wellheads (11-33-FL-B01@3', 12-33-FL-B01@3', 13-33-FL-B01@3', 32-33-FL-B01@3', 33-33-FL-B01@3', and 34-33-FL-B01@3') and separator (FL-B01@4' and FL-B02@4'), and where the flowlines changed direction (FL-B13@4'), and submitted for laboratory analysis to determine if a release occurred. Laboratory analytical results indicated that pH concentrations in samples (11-33-WH-B01@6', 12-33-WH-B01@6', 34-33-WH-B01@6') exceeded Table 915-1 and background limits. At the time of initial sampling, the pH exceedances were believed to be within the acceptable range of analytical variability. Per the COA received on a previous Form 27-Supplemental (Doc. 403110421) denying the application of analytical variability, verification soil samples (11-33-B01V@6, 12-33-B01V@6, 34-33-B01V@6) were submitted for laboratory analysis of pH only to verify the exceedances in samples (11-33-WH-B01@6', 12-33-WH-B01@6', 34-33-WH-B01@6'). Laboratory analytical results are pending and will be provided in a forthcoming Form 27-Supplemental. 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 photographic log is provided as Attachment A.

## 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 March 4 - April 21, 2022, 17 soil samples were collected from the excavation and flowline removal potholes as described in previous Form 27-Supplemental (Doc. 403110421). Laboratory analytical results indicated that the pH concentrations in samples (11-33-WH-B01@6', 12-33-WH-B01@6', and 34-33-WH-B01@6') exceeded ECMC Table 915-1 and site-specific background limits. At the time of initial sampling, the pH values in (11-33-WH-B01@6', 12-33-WH-B01@6', and 34-33-WH-B01@6') were believed to be within the acceptable range of analytical variability. Per the COA received on Form 27-Supplemental (Doc. 403110421), on August 16, 2024, verification samples (11-33-B01V@6, 12-33-B01V@6, 34-33-B01V@6) were collected and submitted for laboratory analysis of pH only to verify the exceedances. Additionally, background samples sufficiently away from oil & gas activity have been collected to address the pH exceedances and analytical results for the verification and background samples are pending.

### Proposed Groundwater Sampling

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

Groundwater was not encountered during wellhead cut and cap or flowline removal operations. If groundwater is encountered during ongoing site assessment activities, a minimum of one grab sample will be collected as soon as practical. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4 and 1,3,5-TMB, using standard methods appropriate for detecting the target analytes in ECMC Table 915-1.

### 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 ):

On March 4, 2022, visual inspection and field screening of soils was conducted at 12 sidewall locations within the wellhead cut and cap excavation area, and 14 locations at the ground surface adjacent to the cut and cap excavation. Based on the inspection and screening results, no soil samples were submitted from these areas in accordance with ECMC Operator Guidance. On March 11, 2022, a soil gas survey was conducted at 27 soil vapor points installed adjacent to the former Cottonwood 11, 12, 13, 32, 33, 34-33 wellheads following cut and cap operations. GEM 5000 field readings were non-detect for methane at all 27 soil vapor points. The SVP screening results are summarized in Table 6. Soil analytical results are presented in Tables 2 through 5. The photographic log is provided as Attachment A.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 17

Number of soil samples exceeding 915-1 3

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

Approximate areal extent (square feet) 0

### NA / ND

ND Highest concentration of TPH (mg/kg) \_\_\_\_\_

-- Highest concentration of SAR 7.71

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 6

### Groundwater

Number of groundwater samples collected 0 Highest concentration of Benzene (µg/l) \_\_\_\_\_  
 Was extent of groundwater contaminated delineated? No Highest concentration of Toluene (µg/l) \_\_\_\_\_  
 Depth to groundwater (below ground surface, in feet) \_\_\_\_\_ Highest concentration of Ethylbenzene (µg/l) \_\_\_\_\_  
 Number of groundwater monitoring wells installed \_\_\_\_\_ Highest concentration of Xylene (µg/l) \_\_\_\_\_  
 Number of groundwater samples exceeding 915-1 \_\_\_\_\_ 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@3' - WH-BG03@3', WH-BG01@6' - WH-BG03@6', BG04@3 - BG07@3, BG04@6 - BG07@6, and BG04@12 - BG06@12 were collected from native material with comparable depths, lithology, and land use adjacent to the wellhead cut and cap excavation area. 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 4 and 5.

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?

Verification samples (11-33-B01V@6, 12-33-B01V@6, 34-33-B01V@6) to verify the pH exceedances in samples (11-33-WH-B01@6', 12-33-WH-B01@6', and 34-33-WH-B01@6') and additional background samples sufficiently away from oil & gas activity have been collected to address the pH exceedances and laboratory analytical results are pending. Assessment activities are ongoing and will be provided in a forthcoming Form 27-Supplemental.

**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.

Verification samples (11-33-B01V@6, 12-33-B01V@6, 34-33-B01V@6) to verify the pH exceedances in samples (11-33-WH-B01@6', 12-33-WH-B01@6', and 34-33-WH-B01@6') and additional background samples sufficiently away from oil & gas activity have been collected to address the pH exceedances and laboratory analytical results are pending. Assessment activities are ongoing and will be provided in a forthcoming Form 27-Supplemental.

**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.

Verification samples (11-33-B01V@6, 12-33-B01V@6, 34-33-B01V@6) to verify the pH exceedances in samples (11-33-WH-B01@6', 12-33-WH-B01@6', and 34-33-WH-B01@6') and additional background samples sufficiently away from oil & gas activity have been collected to address the pH exceedances and laboratory analytical results are pending. Assessment activities are ongoing and will be provided in a forthcoming Form 27-Supplemental.

**Soil Remediation Summary**

In Situ

Ex Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

\_\_\_\_\_ Excavate and offsite disposal

\_\_\_\_\_ Chemical oxidation

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_

\_\_\_\_\_ 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.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

### Approved Reporting Schedule:

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 Progress Report

## 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 Energy and Carbon Management 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: \$ 5000

## WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation?

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

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

E&P waste (solid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

E&P waste (liquid) description

ECMC Disposal Facility ID #, if applicable:

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. 11/18/2021

Actual Spill or Release date, or date of discovery. \_\_\_\_\_

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/04/2022

Proposed site investigation commencement. 03/04/2022

Proposed completion of site investigation. 08/16/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. \_\_\_\_\_

Proposed date of completion of Remediation. \_\_\_\_\_

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: Erik Mickelson \_\_\_\_\_

Title: Environmental Lead \_\_\_\_\_

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: Candice (Nikki) Graber \_\_\_\_\_

Date: 11/07/2024 \_\_\_\_\_

Remediation Project Number: 22016 \_\_\_\_\_

**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**

403905013	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403905529	SOIL SAMPLE LOCATION MAP
403905530	SITE MAP
403905531	SOIL SAMPLE LOCATION MAP
403905534	ANALYTICAL RESULTS
403905536	ANALYTICAL RESULTS
403905553	PHOTO DOCUMENTATION
403986145	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 8 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)