

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
Alexander Ahmadian

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.

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 Phone: <u>(970) 336-3500</u> Mobile: <u>(970) 515-1698</u>
Address: <u>P O BOX 173779</u>		
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80217-3779</u>		
Contact Person: <u>Gregory Hamilton</u> Email: <u>Gregory_Hamilton@oxy.com</u>		

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 27883 Initial Form 27 Document #: 403319835

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>LOCATION</u>	Facility ID: <u>426666</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>LUDWIG H 06-31D</u>	Latitude: <u>40.260930</u>	Longitude: <u>-104.714910</u>	
	** correct Lat/Long if needed: Latitude: <u>40.261247</u>	Longitude: <u>-104.715530</u>	
QtrQtr: <u>NWNW</u> Sec: <u>6</u> Twp: <u>3N</u> Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>			
Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>483773</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Knaub 1-6, Ludwig H06-31D O SA AST</u>	Latitude: <u>40.261072</u>	Longitude: <u>-104.715610</u>	
	** correct Lat/Long if needed: Latitude: _____	Longitude: _____	
QtrQtr: <u>NENE</u> Sec: <u>1</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 SC

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

The nearest domestic water well is located approximately 700 feet northwest of the release location.
The nearest occupied building is located approximately 775 feet northwest of the release location.

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	40' (N-S) x 37' (E-W) x 0.5' 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.

On January 19, 2023, a release was discovered at the Knaub 1-6, Ludwig H06-31D O SA Production Facility location due to approximately 26.6 barrels of crude oil being released within lined secondary containment from a failed load out line associated with an above-ground storage tank (AST). On January 20, 2023, the release became State Reportable due to the verified quantity of released fluids. As such, a Form 19-Initial Spill/Release Report was submitted on January 20, 2023 (COGCC Document No. 403297112), and the COGCC issued Spill/Release Point 483773. On January 26, 2023, a waste characterization soil sample (SS01@3") was collected from material most likely to be impacted within the release area, and submitted for laboratory analysis of the full Table 915-1 analytical suite using standard COGCC-approved methods. Analytical results for the waste characterization sample indicated that soil impacts were present due to benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH), 1,2,4- and 1,3,5-trimethylbenzene (TMB), and polycyclic aromatic hydrocarbons (PAHs). Tank battery decommissioning and impacted soil removal activities were initiated on April 7, 2023. Soil screening activities conducted below the former ASTs indicated that soil impacts remained, and no soil samples were submitted. All of the remaining material within the liner was later removed and the liner was verified to be in tact. Facility decommissioning activities were subsequently completed on April 13, 2023. Visual inspection and field screening of soils was conducted following decommissioning activities, and 5 confirmation soil samples were submitted for laboratory analysis. Groundwater was not encountered during decommissioning or impacted soil removal activities. A topographic Site Location Map 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 Figure 2.

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 April 13, 2023, confirmation soil samples were collected from the former AST, produced water vessel (PWV), and separator locations, at depths of approximately 3 and 6 inches bgs. The AST and PWV soil samples were collected from below the former tank battery secondary containment liner following its removal, which was verified to be in tact. Based on the waste characterization results for the AST release (SS01@3"), the AST confirmation soil samples were submitted for laboratory analysis of BTEX, TPH, 1,2,4- and 1,3,5-TMB, PAHs, arsenic, and barium. The remaining confirmation soil samples were submitted for laboratory analysis of BTEX, TPH, 1,2,4- and 1,3,5-TMB, pH, EC, SAR, and boron, in accordance with the approved Form 27 -Initial (COGCC Document No. 403347129). Analytical results indicated that constituent concentrations in the 5 confirmation soil samples were in compliance with COGCC Table 915-1 standards and/or within the range of site-specific background levels.

Proposed Groundwater Sampling

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

Groundwater was not encountered during facility decommissioning or impacted soil removal activities. If groundwater is encountered during future flowline removal activities, a minimum of one grab sample will be collected as soon as practical. Groundwater samples will be submitted to an accredited laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4- and 1,3,5-trimethylbenzene (TMB), using standard methods appropriate for detecting the target analytes in COGCC 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 April 13, 2023, visual inspection and field screening of soils was conducted at 1 location below the former meter house (MH) and 1 location below the former enclosed combustion device (ECD). Based on the inspection and screening results, hydrocarbon-impacted soil was not observed at the soil screening locations, and no soil samples were submitted for laboratory analysis from these areas in accordance with COGCC Operator Guidance. Soil sample location and field screening data are presented in Table 1. Soil analytical results are presented in Tables 2 through 5. The soil sample and field screening locations are illustrated on Figure 2. The laboratory analytical reports are provided as Attachment A. The field notes and a photographic log are provided as Attachment B. Additional site assessment activities will be conducted following the removal of a flowline associated with this production facility, as described in a previous Form 27-Supplemental update (COGCC Document No. 403364634).

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 6
Number of soil samples exceeding 915-1 1
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 1480

NA / ND

-- Highest concentration of TPH (mg/kg) 14440
-- Highest concentration of SAR 0.358
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 0

Groundwater

Number of groundwater samples collected 0
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet)
Number of groundwater monitoring wells installed
Number of groundwater samples exceeding 915-1

Highest concentration of Benzene (µg/l)
Highest concentration of Toluene (µg/l)
Highest concentration of Ethylbenzene (µg/l)
Highest concentration of Xylene (µg/l)
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 BG01@3" - BG08@3" were collected from native material adjacent to the former production facility location. The background soil samples were submitted for laboratory analysis of Table 915-1 metals and/or the Soil Suitability for Reclamation Parameters, using standard COGCC-approved 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?

Additional soil screening and sampling activities will be conducted following the removal of a flowline associated with this production facility, as described in a previous Form 27-Supplemental update (COGCC Document No. 403364634), to determine if impacts are present. The results of the pending flowline screening and sampling activities will be summarized in a forthcoming Supplemental Form 27 within 90 days following the completion of flowline removal activities.

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.

On April 7 and 13, 2023, approximately 27 cubic yards of impacted material were removed via vacuum truck hydro-excavation activities, and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. The excavation area was subsequently backfilled and contoured to match pre-existing site conditions, following facility decommissioning activities.

REMIEDIATION 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.

Impacted material associated with the AST release was fully contained within the tank battery secondary containment liner, which was verified to be intact, and was completely removed prior to facility decommissioning activities. Laboratory results indicate that constituent concentrations in the 5 confirmation soil samples collected from the former AST, PWV, and separator locations were in compliance with COGCC Table 915-1 standards and/or within the range of site-specific background levels. Hydrocarbon-impacted soil was not observed during field inspection and soil screening activities at the former MH and ECD locations. Groundwater was not encountered during facility decommissioning or impacted soil removal activities. Based on the analytical and soil screening data presented herein, site assessment activities associated with the AST release and Knaub 1-6, Ludwig H06-31D O SA Production Facility decommissioning are complete, and no further activities are required in these areas. Additional flowline removal is pending, as described in a previous Form 27-Supplemental update (COGCC Document No. 403364634), and will be summarized in a forthcoming Supplemental Form 27 within 90 days following the completion of flowline removal activities.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 27

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC Facility ID # _____ 434766

_____ Natural Attenuation

No _____ 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 Remediation progress update

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: \$ 20500

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 27 cubic yards of impacted material were removed via vacuum truck hydro-excavation activities, and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling.

Volume of E&P Waste (solid) in cubic yards 27

E&P waste (solid) description Impacted hydro-excavation soil slurry

COGCC Disposal Facility ID #, if applicable: 434766

Non-COGCC Disposal Facility: _____

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC 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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

Does Groundwater meet Table 915-1 standards? Yes

Is additional groundwater monitoring to be conducted? _____

Operator shall comply with the COGCC 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 COGCC 1000 Series Reclamation Rules. Timeliness of reclamation initiation and completion will be subject to NFA, surface owner discretion and land use, and suitable ground conditions which allow for execution of surface reclamation activities so as to not cause unwarranted damages.

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 provide the seed mix? Yes

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

Did the local soil conservation district provide the seed mix? No

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 12/31/2024

Proposed date of completion of Reclamation. 12/31/2024

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. 01/20/2023

Actual Spill or Release date, or date of discovery. 01/19/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/19/2023

Proposed site investigation commencement. 01/26/2023

Proposed completion of site investigation. 12/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 04/07/2023

Proposed date of completion of Remediation. 04/13/2023

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

All of the impacted material associated with the AST release was contained within the secondary containment liner, and the liner integrity was verified to be in tact prior to its removal. Laboratory analytical results indicate that constituent concentrations in the soil samples collected from the former production facility infrastructure locations, and from below the tank battery secondary containment liner following its removal, were in compliance with COGCC Table 915-1 standards and/or within the range of site-specific background levels.

Based on the analytical and field screening data provided herein, site assessment activities associated with the AST release and Knaub 1-6, Ludwig H06-31D O SA Production Facility decommissioning are complete, and no further activities are required in these areas. Additional flowline removal is pending, as described in a previous Form 27-Supplemental update (COGCC Document No. 403364634), and will be summarized in a forthcoming Supplemental Form 27 within 90 days following the completion of flowline removal activities.

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

Signed: Gregory Hamilton

Title: Senior Env. Consultant

Submit Date: 05/17/2023

Email: Gregory_Hamilton@oxy.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: Alexander Ahmadian

Date: 06/12/2023

Remediation Project Number: 27883

COA Type**Description**

	Supporting documentation on the next Form 27 shall include verification of the secondary containment liner integrity. If the liner integrity has been compromised, confirmation soil samples to document impacts to soil in the release area will be required.
1 COA	

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**

403403943	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403403957	ANALYTICAL RESULTS
403403958	SITE MAP
403403959	PHOTO DOCUMENTATION
403403960	SOIL SAMPLE LOCATION MAP
403403962	ANALYTICAL RESULTS
403430574	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 7 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)