

State of Colorado
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203
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Document Number:

403883475

Receive Date:

08/20/2024

Report taken by:

CHRIS CANFIELD

Site Investigation and Remediation Workplan (Initial 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: PDC ENERGY INC	Operator No: 69175	Phone Numbers
Address: 1099 18TH STREET SUITE 1500		Phone: (303) 860-5800
City: DENVER	State: CO	Zip: 80202
Contact Person: Karen Olson	Email: FRspillremediationcontractor@pdce.com	Mobile: ()

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 36714 Initial Form 27 Document #: 403883475

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

No Multiple Facilities

Facility Type: SPILL OR RELEASE	Facility ID: 486891	API #: _____	County Name: ADAMS
Facility Name: Gus LD Pad	Latitude: 39.952212	Longitude: -104.885496	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SENE	Sec: 21	Twp: 1S	Range: 6W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Agricultural, residential

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? No

Other Potential Receptors within 1/4 mile

Domestic Water Wells within 1/4 mile - 857' SE - Permit #227657--A, Receipt #3649660; 1303' SE - Permit #184088, Receipt #0376420J
Occupied Buildings within 1/4 mile - Residential neighborhood present 860' SE
E-470 Highway within 1/4 mile - 1320' N
City of Brighton municipal boundary within 1/4 mile - 660' S

No other potential receptors are located within 1/4 mile of the Site.
Above distances are approximations.

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
Yes	SOILS	45'x60'x1.5' deep	Laboratory analyses

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 5/29/24, a non-reportable release was discovered at the Gus LD pad when 0.53 BBL of produced fluids were observed at the north end of a failed bulk separator fire tube. Excavation activities via hydrovac commenced upon discovery. The release became reportable on 5/30/24 when it was confirmed that over 10 cubic yards of impacted material had been removed from location. Fluid was contained on-site within the steel walled containment area but there was no lining within the containment. A total of approximately 24 cubic yards of impacted soil material has been removed from site and properly disposed of.

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):

One waste characterization sample, Waste Char, was collected on 5/30/2024 and indicated organic exceedances were present after analytical data was received. Eleven confirmation soil samples were collected on 6/03/2024 following the removal of all visual and olfactory indications of contamination. All soil samples were submitted to Summit Scientific Inc. in Golden, Colorado and Origins Laboratory in Denver, Colorado and analyzed for ECMC Table 915 -1 constituents. Laboratory results for confirmation samples indicated that all petroleum constituents were less than their respective Table 915-1 standards. However, elevated pH, SAR, EC, boron, arsenic, barium, cadmium, chromium IV, lead and selenium remain in exceedance of ECMC standards. Laboratory data is summarized in Tables 1 to 4 and illustrated on Figures 3 and 4.

Proposed Groundwater Sampling

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

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 12

Number of soil samples exceeding 915-1 12

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

Approximate areal extent (square feet) 2700

NA / ND

-- Highest concentration of TPH (mg/kg) 4210

-- Highest concentration of SAR 37.5

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 1

Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

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?

☐ 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?

At least one background sample will be collected from "comparable non-impacted soil" as per EPS General Comments on document number: 403826338. Therefore, PDC shall collect a background sample within the facility away from hydrocarbon impacted material as this is a recent spill and not a final reclamation site. Background samples will be analyzed for Table 915-1 Metals in Soils and Suitability for Soil Reclamation parameters.

Additionally, a supplemental site investigation (SSI) will be conducted to further vertically and horizontally delineate the pH, SAR, EC and boron exceedances identified during confirmation sampling. The results of the SSI will be submitted on a subsequent Form 27.

REMEDIAL ACTION PLAN

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Excavation via hydrovac trucks was completed between May 30, 2024 and June 3, 2024. Approximately 24 cubic yards of impacted soil were transported to Republic Services Tower Road Landfill in Commerce City, CO and Waste Management Buffalo Ridge Landfill in Keenesburg, CO for disposal.

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.

A remedial excavation was conducted to remove impacted soils from the firetube release within the secondary containment. This excavation has adequately remediated petroleum constituents in the release area. However, elevated pH, SAR, EC, boron, arsenic, barium, cadmium, chromium IV, lead and selenium remain to be resolved.

On 5/30/24, a produced fluids sample was collected from the separator and analyzed for total recoverable metals. These data were used to determine the mass of metals that were released in the 0.53 BBL release. This mass was compared to the calculated mass of metals removed as a result of the excavation.

- As shown on Table 5, the amount of arsenic removed was approximately 1,914,705 times more than the amount of arsenic that was released.
- As shown in Table 6, the amount of barium removed was approximately 589 times more than the amount of barium that was released.
- As shown in Table 7, the amount of selenium removed was approximately 87,000 times more than the amount of selenium that was released.
- As shown in Table 8, the amount of lead removed was approximately 5,689,000 times more than the amount of lead that was released.
- As shown in Table 9, the amount of cadmium removed was approximately 141,127 times more than the amount of cadmium that was released.
- As shown in Table 10, the amount of chromium IV removed was approximately 11,382 times more than the amount of chromium IV that was released.

Since the amount of arsenic, barium, selenium, lead, cadmium and chromium IV removed were significantly greater than the amount of these metals that were released, the additional metals removed can be attributed to native concentrations and the presence of these metals in the excavation samples can be considered adequately remediated.

Additionally, a supplemental site investigation (SSI) will be conducted to further vertically and horizontally delineate the pH, SAR, EC and boron exceedances identified during confirmation sampling.

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) _____ 24
_____ Air sparge / Soil vapor extraction	_____ Name of Licensed Disposal Facility or ECMC Facility ID # _____
_____ 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.

Groundwater was not encountered in the excavation.

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 Site Investigation 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.

Operator does not have site-specific financial assurance for this project; however, Operator has inactive well, blanket, and surface bonding including Surety IDs 106077122, 106473808, and 106473820, as well as commercial general liability and/or umbrella/excess insurance meeting the requirements of Rule 705.b. Operator does not anticipate making an insurance claim for this project.

- Source mass removal is complete.

- Petroleum-impacted soil has been removed and Table 915-1 metals concentrations reported in confirmation soil samples collected at the Site have all been resolved.

- PDC proposes to delineate the horizontal and vertical extents of non-compliant levels of pH, EC, SAR and Boron discovered in confirmation soil samples.

Results shall be reported in a Supplemental Form 27.

Costs included herein are estimates only and may change over time based on numerous factors. Accordingly, Operator makes no guarantees as to the accuracy of such cost estimates, thus providing an estimate for the next year below.

Operator anticipates the remaining cost for this project to be: \$ 5000

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:

No beneficial use.

Volume of E&P Waste (solid) in cubic yards 24

E&P waste (solid) description Petroleum impacted soil

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Waste Management - Buffalo Ridge Landfill, Republic Services - Tower Road Landfill

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

E&P waste (liquid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

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 Gus LD Pad is an active facility and there are no current plans for decommissioning or reclamation activities.

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. 05/30/2024

Actual Spill or Release date, or date of discovery. 05/30/2024

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/29/2024

Proposed site investigation commencement. 05/30/2024

Proposed completion of site investigation. 12/31/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/30/2024

Proposed date of completion of Remediation. 06/03/2024

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

This Form 27 Initial is being submitted to the ECMC as an update for the remedial actions associated with Spill/Release ID: 486891. PDC will submit a Supplemental Form 19 requesting closure of Spill/Release Point ID: 486891 upon the approval of this form and receipt of a remediation project number.

A remedial excavation was conducted to remove approximately 24 cubic yards of impacted soil. Confirmation soil samples from the excavation have resolved all Table 915-1 constituents except arsenic, barium, selenium, lead, cadmium, chromium IV, pH, EC, SAR and boron.

Since the amount of arsenic, barium, selenium, lead, cadmium and chromium IV removed were significantly greater than the amount of these metals that were released (see Remediation Summary tab), the additional metals removed can be attributed to native concentrations and the presence of these metals in the excavation samples can be considered resolved.

For the non-compliant Soil Suitability for Reclamation constituents including pH, EC, SAR and boron, PDC will collect additional soil samples to delineate the horizontal and vertical extent of these impacts.

Further, PDC shall collect at least one background sample from comparable non-impacted soil and analyze background samples for Table 915-1 Metals in Soils and Suitability for Soil Reclamation constituents.

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

Signed: Michelle Bartoszek

Title: HSE Advisor

Submit Date: 08/20/2024

Email: michelle.bartoszek@chevron.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: CHRIS CANFIELD

Date: 08/21/2024

Remediation Project Number: 36714

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

403883475	INVESTIGATION/REMEDATION WORKPLAN (INITIAL)
403883486	REMEDATION PROGRESS REPORT
403896988	FORM 27-INITIAL-SUBMITTED

Total Attach: 3 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)