

State of Colorado
Energy & Carbon Management Commission

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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: 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: Michelle Bartoszek	Email: michelle.bartoszek@chevron.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: 67W 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

NA / ND

Number of soil samples collected 22

Number of soil samples exceeding 915-1 22

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

Approximate areal extent (square feet) 2700

-- 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

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.

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 and Table 915-1 metals constituents in the release area (see approved Form 27, Doc #403883475). However, elevated pH, SAR, EC, and boron remain to be resolved.

A supplemental site investigation (SSI) was conducted to further vertically and horizontally delineate the pH, SAR, EC and boron exceedances identified during confirmation sampling. Six soil borings were advanced on November 8, 2024 as shown on the attached figure. Each of these borings were advanced on the Gus Pad which consists of imported backfill. Soil chemistry from these samples is provided in Tables 3 and 4.

The maximum background pH level was 9.39 which is higher than any of the excavation soil samples; therefore, PDC proposes that pH be considered resolved.

The elevated EC levels observed in the excavation have been adequately delineated but not resolved.

The elevated SAR concentrations observed in the excavation are also present in the imported backfill but not as high as the excavation samples. PDC proposes that the SAR concentrations in the imported backfill adequately delineate SAR but not resolve it.

The elevated boron concentration in sample SS-01 was 3.71 mg/L. This sample location was resampled with soil samples collected at depths of 1 ft and 2 ft. Boron was less than its Table 915-1 standard; therefore, PDC proposes that boron be considered adequately remediated.

PDC proposes that pH and boron be considered adequately remediated and EC and SAR be considered adequately delineated. With ECMC approval, PDC will prepare a Reclamation Plan to determine if EC and SAR can remain in place. This Reclamation Plan will be submitted with the next Supplemental Form 27.

Soil Remediation Summary

☐ In Situ

☒ 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 prepare a Reclamation Plan to address elevated levels of pH and SAR observed 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:

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 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:

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OPERATOR COMMENT

A remedial excavation was conducted to remove approximately 24 cubic yards of impacted soil. Confirmation soil samples from the excavation resolved all Table 915-1 constituents except pH, EC, SAR and boron (see approved Form 27, Doc #403883475).

As described in the Remediation Summary tab, PDC proposes that pH and boron be considered adequately resolved and that EC and SAR are adequately delineated but not resolved.

With ECMC approval, PDC will prepare a Reclamation Plan to determine if EC and SAR can remain in place. This Reclamation Plan will be submitted with the next Supplemental Form 27.

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

Signed: Paul Henehan

Title: Consultant

Submit Date:

Email: paulh@fremontenv.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:

Date:

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

403996967	ANALYTICAL RESULTS
403997388	SITE INVESTIGATION REPORT

Total Attach: 2 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)