

State of Colorado Energy & Carbon Management Commission

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Document Number:

404051696

Receive Date:

01/15/2025

Report taken by:

Nick Cholas

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 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: <u>PDC ENERGY INC</u> | Operator No: <u>69175</u> | Phone Numbers Phone: <u>(970) 313-5582</u> Mobile: <u>()</u> |
| Address: <u>1099 18TH STREET SUITE 1500</u> | | |
| City: <u>DENVER</u> | State: <u>CO</u> Zip: <u>80202</u> | |
| Contact Person: <u>Jason Davidson</u> | Email: <u>jason.davidson@chevron.com</u> | |

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 32028 Initial Form 27 Document #: 403546839

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: <u>LOCATION</u> | Facility ID: <u>327089</u> | API #: _____ | County Name: <u>WELD</u> |
| Facility Name: <u>LEE-64N65W 5NWNW</u> | | Latitude: <u>40.346655</u> | Longitude: <u>-104.693509</u> |
| | | ** correct Lat/Long if needed: Latitude: <u>40.346655</u> | Longitude: <u>-104.693509</u> |
| QtrQtr: <u>NWNW</u> | Sec: <u>5</u> | Twp: <u>4N</u> | Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u> |

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use 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? Yes

Other Potential Receptors within 1/4 mile

Closest Domestic Well within quarter mile – 1140' NNW
Additional Domestic Wells – None within a quarter mile
Nearest Surface Water – None within a quarter mile
Nearest Occupied Building – Residential building 250' N
Additional Occupied Buildings – Residential buildings 785' W, 700' NW, 895' SW

No other potential receptors are located within ¼ 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 |
|--------------|----------------|-------------------------------|---------------------------------------|
| UNDETERMINED | GROUNDWATER | Undetermined | GWM Well Install |
| Yes | SOILS | Refer to Fig 2 and Tables 2-4 | Excavation/Confirmation Soil Sampling |

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

Hydrocarbon impacted soils were identified adjacent to the separator dump line and at the partially buried produced water vessel (PWV) during initial facility closure activities. Excavation was conducted and the identified soil was removed from adjacent to the separator dump line and transported offsite for disposal. Analytical results reported for both excavation confirmation soil samples (EX01 @6 and EX02@3) collected from the final extents of the excavation were compliant with their applicable Table 915-1 GWSSLs, or less than 1.25x the highest background concentrations for arsenic (7.16 mg/kg).

A waste characterization soil sample (WC01@5) was collected from the area that exhibited the highest degree of impacts and identified impacted soil was removed at the PWV. Analytical results for WC01@5 reported benzene, ethylbenzene, naphthalene, 1,2,4-TMB, and TPH above their respective Table 915-1 GWSSLs. There were also detections of total xylenes, fluoranthene, and pyrene. PDC is currently in the process of source mass removal of hydrocarbon impacted material at the Site.

Please refer to the Source Removal Summary section below for a summary of the source removal activities conducted at the Site.

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):

Analytical results for all facility closure confirmation soil samples submitted for analysis are compliant with Table 915-1 GWSSLs or less than 1.25x the highest background concentrations for arsenic (7.16 mg/kg). Analytical results for soil sample WC01@5 reported benzene, ethylbenzene, naphthalene, 1,2,4-TMB, TPH, and arsenic above their respective Table 915-1 GWSSLs. There were also detections of total xylenes, fluoranthene, and pyrene below their respective Table 915-1 GWSSLs.

Proposed Groundwater Sampling

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

Five groundwater monitoring wells are proposed to be installed at the Site. The wells will be installed and developed following DWR guidelines and will be sampled on a quarterly basis for Full Table 915-1 parameters until four consecutive compliant quarters are achieved. The locations of the proposed monitoring wells are displayed on Figure 3.

Refer to the Groundwater Monitoring section of this Form 27.

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 16

Number of soil samples exceeding 915-1 6

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 2290

NA / ND

-- Highest concentration of TPH (mg/kg) 0.76

-- Highest concentration of SAR 2.47

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 16

Groundwater

Number of groundwater samples collected 1

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 8

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 915-1 0

-- Highest concentration of Benzene (µg/l) 1.3

ND Highest concentration of Toluene (µg/l)

ND Highest concentration of Ethylbenzene (µg/l)

-- Highest concentration of Xylene (µg/l) 150

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?

Eleven site-specific background samples were collected from seven background soil borings (BKG01 through BKG07) from approximately 3 ft., 5 ft., and 7 ft-bgs in areas away from oil and gas infrastructure and were submitted for analysis of EC, pH, SAR, arsenic, cadmium and lead by ECMC approved methods.

☐ 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?

Five groundwater monitoring wells are proposed to be installed at the Site.

Refer to the Groundwater Monitoring section of this 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.

During initial facility closure activities, hydrocarbon impacted soils were discovered adjacent to the separator dump line. Approximately 3 cubic yards were removed and transported offsite for disposal. One confirmation soil sample (EX01@6) was collected from the floor of the excavation at approximately 6 ft-bgs and one confirmation soil sample was collected from the sidewall of the excavation at approximately 3 ft-bgs. The final extent of the excavation was approximately 3 feet by 5 to a total depth of 6 ft-bgs.

Hydrocarbon impacted soil was also discovered at the PWV and was reported as a historic release in Form 19 document number 403644729. One waste characterization soil sample (WC01@5) was collected at approximately 5 ft-bgs from the area exhibited the highest degree of impacts. Approximately 23 cubic yards of impacted soil was hauled offsite for disposal under PDC manifest to Waste Management's North Weld Landfill in Ault, CO in accordance with Rules 905 and 906. Copies of the waste manifests are available upon request. The extent of the excavation measured approximately 10 feet by 11 feet by 5 feet deep.

Between October 10 and November 6, 2024, an additional 3,610 cubic yards of impacted soil was excavated from the area around the former produced water vessel, and hauled offsite for disposal under PDC manifest to Waste Management's North Weld Landfill in Ault, CO in accordance with Rules 905 and 906. Copies of the waste manifests are available upon request.

Additional information is provided in the Operator Comments section of this Form 27.

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.

As described in the Source Removal Summary section of this Form 27, approximately 3,633 cubic yards of the impacted soil was excavated and hauled offsite for disposal. Due to the presence of impacted soil in contact with groundwater, PDC proposes the installation of five groundwater monitoring wells at the Site.

Please refer to the Groundwater Monitoring and Operator Comments sections of this Form 27 for additional discussion.

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) _____ 3633

Name of Licensed Disposal Facility or ECMC Facility ID # _____

_____ Excavate and onsite remediation

_____ 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

Yes _____ Other _____ 12,066 bbls pumped from the base of the excavation

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.

Due to the presence of impacted soil in contact with groundwater, PDC proposes the installation of five groundwater monitoring wells at the Site. The wells will be installed to a minimum depth of 15 ft-bgs with 10 feet of screen. Boring logs will be developed. Because soil impacts have been removed from the Site, soil samples will not be collected unless apparent impacts are encountered. If impacts are encountered, confirmation soil samples will be analyzed for Full Table 915-1 parameters. The wells will be installed and developed following DWR guidelines and will be sampled on a quarterly basis for Full Table 915-1 parameters until four consecutive compliant quarters are achieved. The locations of the proposed monitoring wells are displayed on Figur

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 and Remediation 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.

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.

- Facility Closure Activities and confirmation soil sampling was conducted at the Lee 1-5 production facility on January 2 and 3, 2024.
- Source mass removal has been completed
- Five groundwater monitoring wells are proposed to be installed at the Site that will be sampled on a quarterly basis for Full Table 915-1 parameters.

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: \$ 35000

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 3633

E&P waste (solid) description Hydrocarbon impacted soil

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Waste Management's North Weld Landfill, Ault, CO

Volume of E&P Waste (liquid) in barrels 12066

E&P waste (liquid) description Hydrocarbon impacted groundwater

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: NGL C3

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.

Reclamation will be conducted in accordance with ECMC 1004 Series 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. 11/06/2024

Proposed date of completion of Reclamation. 03/31/2027

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. 08/28/2023

Actual Spill or Release date, or date of discovery. 01/04/2024

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/02/2024

Proposed site investigation commencement. 01/02/2024

Proposed completion of site investigation. 03/31/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 01/03/2024

Proposed date of completion of Remediation. 06/30/2026

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

This Supplemental Form 27 was prepared for the 1Q25 timeline update for the Lee 1-5 production facility (Site).

Hydrocarbon impacted soil was identified at the former produced water vessel during facility closure activities. One waste characterization soil sample (WC01@5) was collected at approximately 5 ft-bgs from the area exhibiting the highest degree of impacts and a total of approximately 23 cubic yards of impacted soil was removed.

Between October 10 and November 6, 2024, an additional 3,610 cubic yards of impacted soil was removed from the area around the former produced water vessel. Nine confirmation soil samples collected from the sidewalls, and 6 confirmation soil samples collected from the floor of the excavation document vertical and lateral compliance. 1,2,4-TMB was reported above its respective standard in soil sample EX03@14. The material in this area was removed and soil sample EX06@16.5 documents vertical compliance at this location.

The highest pH reported for background soil samples was 8.33 reported for soil sample BKG02@7. Levels of pH were reported above the highest background value of 8.33 in confirmation soil samples EX01@16 (8.35), EX06@16.5 (8.37), EX07@16 (8.40), EX09@9 (8.36), and EX12@16 (8.38). There were no field screening indicators, nor did any other of the analytical results for these samples indicate the elevated pH is associated with oil and gas operations. Therefore, the analytical results for pH for these samples are interpreted as representative of background conditions. PDC will compare all Site samples remaining in place to all background samples collected at the Site, and at the wellhead, using Wilcoxon analysis to determine if the elevated pH remaining on Site is representative of background conditions. The final excavation extents, and soil sample locations, are presented on Figure 3.

Groundwater was encountered in the excavation between 8 ft-bgs and 10 ft-bgs. Approximately 12,066 barrels of groundwater were pumped out of the excavation in order to continue excavating vertically to depth and was hauled to a permitted disposal facility. A grab groundwater sample (GW01) was collected on October 14, 2024, and submitted for analysis of Full Table 915-1. All results were compliant with Table 915-1 groundwater standards, but there were detections of benzene, xylenes, and TMBs.

PDC proposes the installation of five groundwater monitoring wells at the Site, as discussed in the Groundwater Monitoring section of this Form 27. Figures, Tables, a photolog of final excavation extents, and analytical reports for excavation samples are attached.

At the time of this submittal, the previous quarterly Supplemental Form 27 Doc. #403962134, submitted on 10/17/2024, is still in process.

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

Signed: Ben Baugh

Title: Senior Geologist

Submit Date: 01/15/2025

Email: bbaugh@entradainc.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: Nick Cholas

Date: 01/17/2025

Remediation Project Number: 32028

COA Type

Description

| | |
|--------|---|
| | Operator will continue quarterly reporting until the site investigation is complete and Table 915-1 standards are met within the remediation area. |
| | ECMC approves of the proposed installation of five groundwater monitoring wells. If field observations indicate that the proposed delineation borings are located inside the previous excavation extent additional soil borings will be required. Additionally, depending on the results of the current site investigation plan, Operator may be required to install additional soil borings to fully delineate soil impacts. |
| 2 COAs | |

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

| | |
|-----------|---|
| 404051696 | INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL) |
| 404051705 | ANALYTICAL RESULTS |
| 404051706 | ANALYTICAL RESULTS |

| | |
|-----------|--------------------------------|
| 404051707 | ANALYTICAL RESULTS |
| 404051709 | ANALYTICAL RESULTS |
| 404051710 | ANALYTICAL RESULTS |
| 404051715 | ANALYTICAL RESULTS |
| 404051717 | ANALYTICAL RESULTS |
| 404051719 | ANALYTICAL RESULTS |
| 404051721 | ANALYTICAL RESULTS |
| 404051725 | ANALYTICAL RESULTS |
| 404051726 | ANALYTICAL RESULTS |
| 404051728 | MAP |
| 404051731 | SOIL SAMPLE LOCATION MAP |
| 404051733 | SOIL SAMPLE LOCATION MAP |
| 404051734 | PHOTO DOCUMENTATION |
| 404051735 | ANALYTICAL RESULTS |
| 404051808 | ANALYTICAL RESULTS |
| 404062331 | FORM 27-SUPPLEMENTAL-SUBMITTED |

Total Attach: 19 Files

General Comments

| <u>User Group</u> | <u>Comment</u> | <u>Comment Date</u> |
|-------------------|----------------|---------------------|
| | | Stamp Upon Approval |

Total: 0 comment(s)