

State of Colorado Energy & Carbon Management Commission

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403470372

Receive Date:

07/26/2023

Report taken by:

BOB CHESSON

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>PDC ENERGY INC</u>	Operator No: <u>69175</u>	Phone Numbers
Address: <u>1099 18TH STREET SUITE 1500</u>		Phone: <u>(303) 860-5800</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80202</u>
Contact Person: <u>Karen Olson</u>	Email: <u>tasfillremediationcontractor@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 16260 Initial Form 27 Document #: 402574838

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>333319</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>LATHAM RESERVOIR-64N65W 2SESW</u>		Latitude: <u>40.335536</u>	Longitude: <u>-104.632817</u>
** correct Lat/Long if needed: Latitude: <u>40.335695</u>		Longitude: <u>-104.632785</u>	
QtrQtr: <u>SESW</u>	Sec: <u>2</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 FWS Wetlands

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

Location is within FWS Wetland habitat classified as freshwater emergent wetlands. Location is within a CPW Sensitive Wildlife Habitat buffer of an active bald eagle roost and nest. An irrigation well is located approximately 1,308 feet east of the location. Occupied buildings are located approximately 1,001 feet east of the location. Lower Latham Reservoir is located approximately 991 feet northeast of the 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
Yes	GROUNDWATER	Refer to Document No. 402644637	Implementation of Initial Groundwater Assessment.
Yes	SOILS	Refer to Tables 1-4 and Figures 1&2	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.

On September 23, 2020, a historic release was discovered while performing a pre-reclamation sub-surface survey. Groundwater was encountered at approximately 5 feet below ground surface. PDC and two other area operators utilized this location for oil & gas activities. PDC plugged and abandoned all wells and the associated production facility in 2014 and performed partial reclamation of the area where the tank battery and one well was located. Oxy had midstream gas gathering unit that collected gas from PDC and offsite Noble wells. Oxy and Noble ceased operations on this location in 2019. Quarterly groundwater monitoring and reporting activities were conducted between the third quarter of 2020 through the fourth quarter of 2022.

On January 10, 2023, supplemental source mass removal activities were initiated in the vicinity of BH04 to remove remaining hydrocarbon impacts. During excavation activities, groundwater was encountered at approximately 6 feet below ground surface (bgs). Approximately 2,390 cubic yards (CY) of impacted material were removed from the excavation. Impacted material was transported to the North Weld Waste Management and Buffalo Ridge Landfill facilities for disposal under PDC manifests. Additionally, groundwater vacuum recovery was conducted concurrent with excavation activities and approximately 10,345 barrels (bbls) of groundwater were removed. Impacted groundwater was transported to NGL C1 & NGL C3 for disposal under PDC waste manifests. On January 10, 2023, one waste characterization soil sample (WC01) was collected from the source area at approximately 3 feet bgs and submitted for laboratory analysis of the full COGCC Table 915-1 suite. Final analytical results indicate that the COCs include: BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, TPH (C6-C36), fluorene, 1-methylnaphthalene (M), 2-M, arsenic, and barium.

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):

Between January 10 and January 31, 2023, seventy-five (75) soil samples (SS01-SS23, SS25-SS28 & SS30-SS38, SS40-SS55, SS57-SS68, SS70-SS77, & SS79-SS81) were collected from the sidewalls & base of the separator excavation at depths ranging between 3 feet to 7.5 feet bgs and were submitted for laboratory analysis of the above mentioned COCs. In addition, seven (7) soil samples (SS24, SS29, SS39, SS56, SS69, SS78, & SS82) were collected from the sidewalls of the excavation at approximately 2.5 feet bgs & submitted for laboratory analysis of pH, EC, SAR, and boron. Analytical results indicated that organic compound concentrations were below the applicable Table 915-1 SSLs in the samples collected from the final excavation extent, with the exception of the southwest sidewall.

Proposed Groundwater Sampling

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

Between September 14 and October 22, 2020, initial groundwater assessment activities were conducted to assess and confirm dissolved-phase hydrocarbon impacts. Groundwater samples were collected from nine monitoring wells (BH01 - BH09) and submitted to Summit Scientific Laboratories for analysis of BTEX by EPA Method 8260B. Analytical results indicated that the benzene concentration was in exceedance of the applicable COGCC Table 910-1 groundwater standard in monitoring well BH04. The remaining wells exhibited BTEX concentrations below regulatory standards.

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):

Due to the sensitive nature of the adjacent HPH habitats, excavation activities were discontinued to the southeast. As such, five soil borings (SB01-SB05) were advanced using hand auger and soggy bottom sampler techniques to delineate hydrocarbon impacts beyond the southwest sidewall. Soil samples were collected from each soil boring at 1 foot and 8 feet bgs and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, TPH (C6-C36), fluorene, 1-M, and 2-M. Analytical results indicated that organic compound concentrations were below the applicable Table 915-1 SSLs in the soil boring samples. Due to technical difficulties soil boring logs cannot be provided at the time of this submittal.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 93

Number of soil samples exceeding 915-1 28

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

Approximate areal extent (square feet) 9716

NA / ND

-- Highest concentration of TPH (mg/kg) 3500

-- Highest concentration of SAR 10.1

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 8

Groundwater

Number of groundwater samples collected 10

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 5

Number of groundwater monitoring wells installed 9

Number of groundwater samples exceeding 915-1 2

-- Highest concentration of Benzene (µg/l) 990

ND Highest concentration of Toluene (µg/l)

-- Highest concentration of Ethylbenzene (µg/l) 110

-- Highest concentration of Xylene (µg/l) 630

NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected

0 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?

On January 17 and 31, 2023, five background soil borings (BKG01-BKG05) were advanced topographically up-gradient adjacent to the excavation extent. Soil samples were collected from each background soil boring at 2.5 feet, 3 feet, 6.5 feet, 7 feet, 7.5 feet, and 8 feet bgs and submitted for analysis of COGCC Table 915-1 metals, pH, and SAR. Soil sample BKG01 @ 3' was submitted for additional analysis of EC and boron. Analytical results indicated that arsenic, barium, cadmium, selenium, silver, pH, EC, and SAR were in exceedance of the applicable regulatory standards in native soil.

☒ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) 2390

Volume of liquid waste (barrels) 10345

☒ Is further site investigation required?

During source mass removal activities, impacted soils were observed on the southwest sidewall of the excavation. Due to the presence of a HPH habitats, source mass removal activities were discontinued along the southwest sidewall. A Flood Hazard Development Permit (FHDP) has been submitted to Weld County, Colorado. Supplemental source mass removal activities will resume pending the approval of the FHDP, approval of this Form, and landowner approval. A remediation strategy will be determined following supplemental source mass removal activities.

Up to three (3) additional background soil boring will be advanced adjacent to the former excavation extent in order to evaluate arsenic and barium in native material. The proposed soil boring locations are illustrated on Figure 3.

Pending the completion of supplemental source mass removal activities, additional groundwater monitoring wells will be installed to reestablish and expand the monitoring network in order to confirm absence of dissolved phase hydrocarbon impacts. Monitoring well locations will be proposed in a forthcoming Supplemental 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.

Following the pre-reclamation sub-survey conducted in September 2020, dissolved-phase impacts were discovered south of the former PDC tank battery location. Based on the results from a desktop review, the location of dissolved-phase impacts are in proximity of the historic tank battery location originally located on the southern half of the lease area, which was maintained by former operators.

Between January 10 and 31, 2023, approximately 2,390 cubic yards of impacted material were excavated in the vicinity of BH04. Impacted material was transported to the North Weld Waste Management and Buffalo Ridge Landfill facilities for disposal under PDC manifests.

Groundwater vacuum recovery activities were conducted concurrent with excavation activities. Approximately 10,345 barrels of groundwater were recovered from the excavation. Impacted groundwater was transported to the NGL C1 & NGL C3 facilities for disposal under PDC waste manifests.

Additional hydrocarbon impacted material will be removed via mechanical excavation and transported off-site to a licensed disposal facility in accordance with Rules 905 and 906 pending landowner approval.

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.

The remaining hydrocarbon impacts identified to the southwest of the former tank battery will be removed via mechanic excavation pending the approval of the Flood Hazard Development Permit (FHDP), which has been submitted to Weld County, Colorado, approval of this Form, and landowner approval. Confirmation soil samples will be collected from the base and sidewalls of the final excavation extent and submitted for laboratory analysis of the COGCC approved COC analyte suite. Excavation activities and final analytical results will be summarized in a forthcoming Supplemental Form 27. A remediation strategy will be selected following the evaluation of soil and groundwater analytical results.

Analytical results are summarized in Tables 1-4. GPS coordinates and field screened VOC concentrations are summarized in Table 5. Field screening and laboratory sample locations are illustrated on Figure 1. Soil boring locations are illustrated on Figure 2. Proposed soil boring locations are illustrated on Figure 3. The laboratory reports are included as Attachment A. The excavation field notes and photo logs are included in Attachment B.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) 2390

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC 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

Yes _____ 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.

Based on the analytical data collected during source mass removal activities, PDC will conduct quarterly groundwater monitoring until closure criteria are met. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB by EPA Method 8260B.

Pending the completion of supplemental source mass removal activities and landowner approval, additional groundwater monitoring wells will be installed to reestablish the monitoring network at the former tank battery.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other

Confirmation Sample Summary, Analyte Reduction Request, SSIP, & SSMRP

☐ 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 Confirmation Sample Summary, Analyte Reduction Request, SSIP, & SSMRP

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.

- Partial source mass removal has been completed. Removal activities will continue following FHDP approval and landowner approval.
- Investigation and delineation is on-going for soil and groundwater.
- Monitoring wells will be installed and groundwater will be monitored for natural attenuation.
- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the COGCC 1000 Series.

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: \$ 100000

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 2930

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: North Weld Waste Management & Buffalo Ridge Landfill

Volume of E&P Waste (liquid) in barrels 10345

E&P waste (liquid) description Hydrocarbon impacted groundwater

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: NGL C1 & 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 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.

Following supplemental source mass removal activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The location will be reclaimed in accordance with the COGCC 1000 series.

Is the described reclamation complete? Yes _____

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. 09/02/2020

Proposed date of completion of Reclamation. 12/22/2026

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. 09/23/2020

Actual Spill or Release date, or date of discovery. 09/23/2020

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/02/2020

Proposed site investigation commencement. 07/20/2023

Proposed completion of site investigation. 12/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 09/02/2020

Proposed date of completion of Remediation. 12/22/2026

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:

Based on soil analytical results received for samples collected during supplemental source mass removal activities in January 2023, additional supplemental source mass removal activities are needed southwest of the excavation extent to remove remaining hydrocarbon impacted material pending approval of the FHDP, approval of this Form, and landowner approval. Additionally, a supplemental site investigation will be conducted to assess arsenic and barium concentrations in native material. Supplemental source mass removal and supplemental site investigation activities are proposed to be completed by the end of the fourth quarter 2023.

OPERATOR COMMENT

Based on analytical results for the waste characterization sample WC01 collected from the BH04 source area, PDC is requesting that the COCs for the historic release discovered at the Latham 2-31; Latham Reservoir tank battery excavation be reduced to the following: BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, TPH (C6-C36), fluorene, 1-methylnaphthalene (M), 2-M, arsenic, and barium.

Following the approval of this form, approval of the Flood Hazard Development Permit (FHDP), and landowner approval, supplemental source mass removal activities will resume at the former Latham 2-31; Latham Reservoir tank battery. Additionally, supplemental site investigation activities will be conducted to assess arsenic and barium concentrations in native material. Supplemental activities are proposed to be completed by the end of fourth quarter 2023.

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

Signed: Karen Olson

Title: Senior Program Manager

Submit Date: 07/26/2023

Email: taspillremediationcontractor@pdce.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: BOB CHESSON

Date: 07/26/2023

Remediation Project Number: 16260

COA Type

Description

0 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
403470372	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403470718	SOIL SAMPLE LOCATION MAP
403470731	SITE INVESTIGATION PLAN
403470734	SOIL SAMPLE LOCATION MAP
403476575	ANALYTICAL RESULTS
403476595	PHOTO DOCUMENTATION
403477887	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 7 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)