

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

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Report taken by:

Taylor Robinson

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>1775 SHERMAN STREET - STE 3000</u>		Phone: <u>(303) 860-5800</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80203</u>
Contact Person: <u>Karen Olson</u>	Email: <u>tasfillremediationcontractor@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 21296 Initial Form 27 Document #: 402888756

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>467698</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>NYC N-65N67W 24SESE</u>		Latitude: <u>40.378098</u>	Longitude: <u>-104.839404</u>
		** correct Lat/Long if needed: Latitude: <u>40.378011</u>	Longitude: <u>-104.838922</u>
QtrQtr: <u>SWSE</u>	Sec: <u>24</u>	Twp: <u>5N</u>	Range: <u>67W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

SITE CONDITIONS

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

Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? Yes

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

Surface Water: Possible Surface Draw - 1,040' SW; FWS Wetlands: 1,040' WNW Riverine (R4SBC).

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	Refer to Tables 1-5 & Figures 1-3	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 March 7, 2022, field screening and confirmation soil sampling was conducted in accordance with the COGCC Rule 911 during the decommissioning and closure of the Booth 25-32 Tank Battery (Figure 1). Based on initial results, it was determined that a historic release was discovered below the former produced water vessel (PWV). Following the discovery, mitigation activities were initiated to delineate and remove remaining hydrocarbon impacts. Approximately 179 cubic yards (CY) of impacted material were removed and transported to the North Weld Waste Management Facility for disposal under PDC manifests.

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 March 7, 2022, one (1) soil sample (PWV01-NW-B) was collected from impacted source material adjacent to and below the PWV at approximately 9 feet bgs. The sample was submitted for laboratory analysis of the full COGCC Table 915-1 analyte suite. Laboratory analytical results from the PWV source area indicated COCs include BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36), chrysene, fluorene, pyrene, 1-M, and 2-M. On April 18, 2022, one (1) soil sample (SS01) was collected from the base of the excavation at a depths of approximately 22 feet bgs and submitted for laboratory analysis of the above referenced COC's. Final analytical results for the soil sample collected from the base of the excavation indicate that organic concentrations are in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater SSLs in SS01.

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):

During initial site investigative activities, deep soil impacts in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater Soil Screening Levels (SSLs) were discovered below 22 feet bgs. Due to the depth of the remaining impacts, source mass removal activities were discontinued. Consequently, on May 3, 2022, four (4) soil borings were advanced to direct push probe refusal in order to delineate the vertical and horizontal extent of the remaining hydrocarbon impacts. Seven (7) soil samples were collected from soil borings (SB01-SB04) from the depth exhibiting the highest observed VOC concentration and/or the terminus of each boring and were submitted for the above referenced COCs. Analytical results indicate that organic compound concentrations in exceedance of COGCC Table 915-1 Protection of Groundwater SSLs remain beneath, north, and south of the former PWV. The horizontal and vertical extent of hydrocarbon impacts have not been delineated.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 16

Number of soil samples exceeding 915-1 7

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

Approximate areal extent (square feet) 365

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

NA / ND

-- Highest concentration of TPH (mg/kg) 4190

-- Highest concentration of SAR 0.461

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 22

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?

On March 7, 2022, three (3) background soil samples (BKG01) were collected at approximately 1 foot, 2.5 feet, and 4 feet bgs from native material topographically up-gradient of the tank battery. All background soil samples were submitted for analysis of COGCC Table 915-1 metals. Analytical results indicated that arsenic, barium, and selenium were in exceedance of the applicable regulatory standards in native soil. Based on these results, arsenic and selenium exceedances observed in soil sample PWV01-NW-B are within 1.25x the background concentrations and indicative of native soil conditions, as referenced in footnote 11 of the Table 915-1.

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

Volume of solid waste (cubic yards) 179

Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

During initial site investigative activities, deep soil impacts in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater Soil Screening Levels (SSLs) were discovered below 22 feet bgs. Due to the depth of the remaining impacts, source mass removal activities were discontinued. Supplemental source mass removal activities will continue under a stamped Engineered Excavation Work Plan and landowner approval.

A remediation strategy will be determined following supplemental source mass 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.

Between March 7 and April 18, 2022, approximately 179 cubic yards of impacted material were excavated below and adjacent to the former PWV and transported to the North Weld Waste Management Facility in Ault, CO for disposal under PDC waste manifests.

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.

On October 31, 2022, four (4) soil borings (SB05-SB08) were advanced to depth ranging between 21 and 24 feet bgs using direct push drilling and solid stem auger drilling methods. Lithologic descriptions and volatile organic compound (VOC) concentrations measured using a photoionization detector (PID) were collected and recorded for each boring. Based on results of sampled intervals collected during initial site activities, confirmation soil samples were collected from each boring at depths ranging between 17 feet and 24 feet bgs. Samples were submitted to Summit Scientific Laboratories for analysis of BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36), chrysene, fluorene, pyrene, 1-M, and 2-M. Analytical results indicated that organic compound concentrations were in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater SSLs in SB08 @ 20'. Based on these results, the vertical and horizontal extents of hydrocarbon impacts have been established, except for the eastern point of compliance. 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 Figures 1 through 3. The laboratory reports are included as Attachment A and the soil boring logs are included in Attachment B.

Due to the estimated volume and depth of the remaining hydrocarbon impacts, mechanical excavation under a stamped Engineered Excavation Work Plan will be the selected remediation strategy to address the remaining source mass. Impacted material will be transported off-site to the North Weld Waste Management facility for disposal under PDC waste manifests. 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.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____ 179

_____ 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

_____ 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 during initial decommissioning, confirmation sampling activities, or supplemental site investigation activities.

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 Timeline Update, Confirmation Sample Summary, and Source Mass Removal Proposal

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.

- Investigation and delineation activities are ongoing in soils.
- Partial source mass removal activities have been conducted.
- Additional source mass removal is required.
- 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: \$ 150000

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 179

E&P waste (solid) description Hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: North Weld Waste Management 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? _____

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 adjacent to the produced water vessel 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. 03/07/2022

Proposed date of completion of Reclamation. 11/17/2027

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. 03/02/2021

Actual Spill or Release date, or date of discovery. 03/07/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/27/2021

Proposed site investigation commencement. 01/01/2023

Proposed completion of site investigation. 03/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/07/2022

Proposed date of completion of Remediation. 11/17/2027

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 has been prepared to provide a timeline update for the Booth 25-32 tank battery. On October 31, 2022, four (4) soil borings (SB05-SB08) were advanced adjacent to the former tank battery excavation. Confirmation soil samples were collected from each boring at depths ranging between 17 feet and 24 feet bgs and were submitted to Summit Scientific Laboratories for analysis of the approved COCs. Analytical results indicated that organic compound concentrations were in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater SSLs in SB08 @ 20'. The vertical and horizontal extents of hydrocarbon impacts beneath the former tank battery have been established, except for the eastern point of compliance.

Based upon the analytical results, organic compound concentrations in exceedance of the COGCC Table 915-1 Protection of Groundwater SSLs remain beneath the former Booth 25-32 tank battery. Consequently, the remaining hydrocarbon impacts will be removed via mechanical excavation under a stamped Engineered Excavation Work Plan. Following the approval of this Form and landowner approval, supplemental source mass removal activities will resume under the stamped Engineered Excavation Work Plan. Excavation activities and final analytical results will be summarized in a forthcoming Supplemental Form 27.

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: 11/21/2022

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: Taylor Robinson

Date: 02/27/2023

Remediation Project Number: 21296

COA Type

Description

	Operator will continue quarterly reporting until the site investigation is complete and the implementation schedule can be updated.
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

403233198	FORM 27-SUPPLEMENTAL-SUBMITTED
403233244	LOGS
403233251	ANALYTICAL RESULTS
403233252	SOIL SAMPLE LOCATION MAP

Total Attach: 4 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)