

State of Colorado
Energy & Carbon Management Commission

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Report taken by:
RICK ALLISON

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 Phone: <u>(303) 860-5800</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>Karen Olson</u>	Email: <u>taspillremediationcontractor@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 27511 Initial Form 27 Document #: 403316448

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>SPILL OR RELEASE</u>	Facility ID: <u>483385</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Pierce - GW Walker 1</u>	Latitude: <u>40.627487</u>	Longitude: <u>-104.774131</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SESE</u>	Sec: <u>28</u>	Twp: <u>8n</u>	Range: <u>66W</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? 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

Nearest Well: Domestic / Stock - 392' W; Surface Water: Irrigation Ditch - 238' E; Occupied Building: 469' SSE; Livestock: 429' SSW; FWS Wetlands: 1,141' WSW Freshwater Emergent Wetland (PEM1A); HPH Sensitive Wildlife Habitat: Rule 1202.d: Wellhead & Flowline Within Mule Deer Winter Concentration Area; Rule 1202.d: Wellhead & Flowline Within Mule Deer Severe Winter Range; Rule 1202.d: Wellhead & Flowline Within Pronghorn Winter Concentration.

Flowline Conflict: Rule 1202.d: Wellhead & Flowline Within Mule Deer Winter Concentration Area; Rule 1202.d: Wellhead & Flowline Within Mule Deer Severe Winter Range; Rule 1202.d: Wellhead & Flowline Within Pronghorn Winter Concentration.

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 1-4 and 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 December 1, 2022, PDC conducted a flowline pressure test and collected a confirmation soil sample. On December 2, 2022, following the return of confirmation soil sampling analytical results, a historic release was discovered at the Walker 1 Flowline. Following the discovery of the release, mitigation activities were initiated and to date, approximately 30 cubic yards of impacted material were removed and transported to the North Weld Waste Management Facility for disposal under PDC waste 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 December 1, 2022, one soil samples (FL-01) was collected from a depth of approximately 1 ft bgs from potentially impacted material where water from the flowline was daylighting on the surface during a pressure test of the abandoned flowline. The soil sample was submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB and TPH. Analytical results indicated compound concentrations were in exceedance of applicable standards. On December 27, 2022, six soil samples (SS01-SS06) were collected adjacent to the flowline leak area from the base and sidewalls of the excavation at depths between 2.5 ft and 7 ft bgs and were submitted for laboratory analysis of the full COGCC Table 915-1 analytical suite. Analytical results indicated that compound concentrations were observed below the COGCC Table 915-1 standards in soil samples collected from the final excavation extent with the exception of pH, arsenic, barium, and/or selenium exceedances observed in soil samples SS01-SS06.

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):

One five-point composite soil sample (SP01) was collected from a spoil pile on-site and submitted for analysis of the full COGCC Table 915-1 analytical suite. Analytical results indicated that compound concentrations were observed below the COGCC Table 915-1 standards with the exception of selenium.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 23

Number of soil samples exceeding 915-1 8

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

Approximate areal extent (square feet) 261

NA / ND

-- Highest concentration of TPH (mg/kg) 50

-- Highest concentration of SAR 5.71

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 10

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?

On December 27, 2022, one background soil boring (BKG01) was advanced in native material up-gradient of the flowline and three soil samples were collected between depths of approximately 2.5 feet and 7 feet bgs and submitted for laboratory analysis of COGCC Table 915-1 metals, pH, EC, and SAR. Analytical results indicated that arsenic was in exceedance of the applicable regulatory standards in native soil.

On June 20, 2023, four (4) background soil borings (BKG02-BKG05) were advanced in native material up-gradient of the flowline and six soil samples were collected between depths of approximately 2.5 feet and 10 feet bgs and submitted for laboratory analysis of arsenic, barium, selenium, and pH. Analytical results indicated that arsenic and barium were observed 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) 30

Volume of liquid waste (barrels) 0

Is further site investigation required?

Up to nine (9) soil borings will be advanced to vertically and horizontally delineate pH and/or arsenic exceedances observed in soil samples SS01 @ 7', SS03 @ 2.5', SB01 @ 8', SB01 @ 10', SB03 @ 2.5', SB03 @ 10', SB04 @ 2.5', SB04 @ 7', SB04 @ 10', SB05 @ 2.5', SB05 @ 7', SB05 @ 8', SB05 @ 10' and collected within and adjacent to the flowline excavation extent. Soil samples will be collected at depths ranging from 2.5 feet and 15 feet bgs, as appropriate for delineation. All confirmation soil samples will be submitted for laboratory analysis of pH and/or arsenic as necessary.

Additionally, up to two (2) background soil borings will be advanced up-gradient of the flowline excavation to 15 feet bgs and will be submitted to the laboratory for analysis of pH and arsenic. Soil samples will be collected at depths ranging from 2.5 feet and 15 feet bgs.

Volatile organic compound (VOC) concentrations using a photoionization detector (PID) and lithologic descriptions will be recorded for each borehole. Supplemental site investigation activities are proposed to be conducted by the end of the fourth quarter 2023, pending approval of this form and landowner approval. The proposed soil boring locations are illustrated on Figure 4.

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.

On December 27, 2022, approximately 30 cubic yards of impacted material were excavated adjacent to and below the flowline and transported to the North Weld Waste Management Facility 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 June 20, 2023, five (5) soil borings (SB01-SB05) were advanced via hand auger to delineate the vertical & horizontal extents of arsenic, selenium, and pH exceedances observed in the final excavation extent. Two soil samples were collected from soil boring SB01 at 8 feet and 10 feet bgs, from soil adjacent to & below SS01 @ 7' and submitted for laboratory analysis of pH, selenium, and/or arsenic as applicable for delineation. Sixteen (16) soil samples were collected from the the four cardinal direction soil borings (SB02-SB05) at depths between 2.5 feet and 10 feet bgs and were submitted for laboratory analysis of arsenic, selenium, and/or pH as applicable for delineation. Analytical results indicated that arsenic levels were in exceedance of the applicable COGCC Table 915-1 standards in soil samples SB03 @ 2.5', SB04 @ 2.5', SB04 @ 7', SB05 @ 2.5', and SB05 @ 7'. In addition, pH was observed in exceedance of the applicable standards in soil samples SB01 @ 8', SB01 @ 10', SB03 @ 10', SB04 @ 10', SB05 @ 8', and SB05 @ 10'. Analytical results indicated selenium was observed below the applicable standards and is horizontally and vertically delineated in all soil borings.

A remediation strategy will be selected following the evaluation of soil analytical results.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 30

_____ 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 pressure testing, release response, source mass removal, or supplemental site investigation activities.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

Quarterly Semi-Annually Annually Other

Confirmation Sample Summary & Supplemental Site Investigation Proposal

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 & Supplemental Site Investigation 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.

- Source mass removal has been completed.
- Investigation and delineation has been completed for organics in soil. Assessment of Table 915-1 metals and pH conditions in native material is ongoing.

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: \$ 15000

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 30

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 excavation 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. 12/01/2022

Proposed date of completion of Reclamation. 08/30/2024

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. 12/02/2022

Actual Spill or Release date, or date of discovery. 12/02/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/01/2022

Proposed site investigation commencement. 09/01/2023

Proposed completion of site investigation. 12/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/01/2022

Proposed date of completion of Remediation. 08/30/2024

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:

Based on the evaluation of the soil analytical results and the need for supplemental site investigation activities, the proposed date of site investigation commencement and the proposed date of the completion of site investigation was adjusted to span through the fourth quarter of 2023.

OPERATOR COMMENT

Following the return of soil analytical results, background and site data for arsenic, barium, and selenium in soils were compared using the non-parametric Mann-Whitney-Wilcoxon rank-sum test to assess if site concentrations were substantially higher than background concentrations. Based on the results, barium concentrations recorded in the site data were not substantially different from background concentrations and are indicative of native soil conditions. Arsenic and selenium results indicated the site concentrations were substantially different from background concentrations. Based on this data, PDC is requesting to remove barium as a contaminate of concern for this remediation project. The Mann-Whitney-Wilcoxon rank-sum test calculations, hypotheses test conditions, and conclusions are included in Attachment D.

Following approval of this form and land owner approval, PDC will conduct a supplemental site investigation to delineate pH and arsenic concentrations in the vicinity of the flowline excavation at the former Walker 1 Flowline. Supplemental Form 27s will be prepared and submitted on a quarterly schedule to provide updates and progress of the remediation until closure criteria has been achieved.

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: 08/31/2023

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: RICK ALLISON

Date: 12/13/2023

Remediation Project Number: 27511

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
403515800	FORM 27-SUPPLEMENTAL-SUBMITTED
403515967	SOIL SAMPLE LOCATION MAP
403515971	SOIL SAMPLE LOCATION MAP
403515977	SOIL SAMPLE LOCATION MAP
403515979	SITE INVESTIGATION PLAN
403515983	ANALYTICAL RESULTS
403515986	PHOTO DOCUMENTATION
403515988	LOGS
403515989	OTHER

Total Attach: 9 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)