

State of Colorado
Energy & Carbon Management Commission

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Document Number:

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Receive Date:

Report taken by:

Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by ECMC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27.

This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATION

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 33411 Initial Form 27 Document #: 403621243

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

Yes Multiple Facilities

Facility Type: WELL	Facility ID: _____	API #: 123-25409	County Name: WELD
Facility Name: HALL 42-33	Latitude: 40.533080	Longitude: -104.776580	
** correct Lat/Long if needed: Latitude: 40.533092		Longitude: -104.776601	
QtrQtr: SENE	Sec: 33	Twp: 7N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: LOCATION	Facility ID: 309810	API #: _____	County Name: WELD
Facility Name: HALL-67N66W 33SENE	Latitude: 40.533080	Longitude: -104.776580	
** correct Lat/Long if needed: Latitude: 40.532955		Longitude: -104.776281	
QtrQtr: SENE	Sec: 33	Twp: 7N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE		Facility ID: 486396		API #:		County Name: WELD	
Facility Name: Hall 43-33 Flowline				Latitude: 40.533198		Longitude: -104.776458	
** correct Lat/Long if needed: Latitude: Longitude:							
QtrQtr: SENE	Sec: 33	Twp: 7N	Range: 66W	Meridian: 6	Sensitive Area? Yes		

Facility Type: SPILL OR RELEASE		Facility ID: 486397		API #:		County Name: WELD	
Facility Name: Hall 42-33 Wellhead				Latitude: 40.533077		Longitude: -104.776590	
** correct Lat/Long if needed: Latitude: Longitude:							
QtrQtr: SENE	Sec: 33	Twp: 7N	Range: 66W	Meridian: 6	Sensitive Area? Yes		

Facility Type: SPILL OR RELEASE		Facility ID: 486398		API #:		County Name: WELD	
Facility Name: Hall 42-33 PWV				Latitude: 40.533053		Longitude: -104.776211	
** correct Lat/Long if needed: Latitude: Longitude:							
QtrQtr: SENE	Sec: 33	Twp: 7N	Range: 66W	Meridian: 6	Sensitive Area? Yes		

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

Tank Battery: Nearest Well: Domestic - 1,128' S; Surface Water: Eaton Ditch - 324' NE; Occupied Building: 457' WSW; Livestock: 0' (Within Pasture); FWS Wetlands: 365' NE Riverine (R4SBC).

Wellhead (Hall 42-33): Nearest Well: Domestic - 1,180' S; Surface Water: Eaton Ditch - 367' NE; Occupied Building: 403' SW; Livestock: 0' (Within Pasture); FWS Wetlands: 400' NE Riverine (R4SBC); 100-Year Floodplain 1,472' WSW of Wellhead.

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 Figure 1 & Tables 5&6	Confirmation Groundwater Sampling
Yes	SOILS	Refer to Figure 1 & Tables 1-4	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 28, 2024, field screening and confirmation soil sampling activities were conducted in accordance with the ECMC Rule 911 during the decommissioning of the Hall 42-33 wellhead, tank battery, and removal of the associated flowline (Figure 1). On March 28, 2024, it was determined that a historic release was discovered during decommissioning activities at the Hall 42-33 Wellhead, Flowline, and Tank Battery when groundwater was observed in the wellhead excavation, the flowline excavation, and the produced water vessel excavation (PWV), these three locations had a sheen on the groundwater. Additionally, on March 28, 2024, mitigation activities were initiated and to date approximately 8 cubic yards of impacted material were removed from the wellhead excavation and transported to the North Weld Waste Management Facility for disposal under a PDC waste manifest.

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):

During source mass removal activities, waste characterization samples will be collected from most impacted interval at the release locations and submitted for laboratory analysis of the ECMC full Table 915-1 analytical suite. Following excavation activities, confirmation samples will be collected from base and sidewalls of the final excavation extents to confirm that remaining hydrocarbon impacts were successfully mitigated. The confirmation samples will be submitted for laboratory analysis of an approved ECMC COC suite or the full the table 915-1 suite.

Proposed Groundwater Sampling

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

Groundwater was encountered during decommissioning activities. Based on the field observations observed during decommissioning activities and receipt of analytical results, releases were reported in accordance with Rule 912.b. Groundwater samples were submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260, chloride and sulfate anions by EPA Method 300.0, and total dissolved solids (TDS) by Method SM 2540C.

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):

On March 28, 2024, soil encountered on-site and below production equipment was visually inspected and field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). Per the approved proposed soil sampling plan, samples were collected below and/or adjacent to the separator flowline, dump lines (SEP-FL & SEP-DL), and the produced water vessel (PWV) base and sidewall exhibiting the highest field screened PID response. Additionally, two soil samples (WH01 & FLR01) were collected below the wellhead & flowline riser at approximately 6 ft & 4 ft bgs, respectively. One soil sample (FL01-01) was collected at the halfway point along the flowline. The above-described soil samples we submitted for laboratory analysis of the full Table 915-1 analytical suite. Analytical results indicated that the 1-methylnaphthalene concentration was in exceedance of the applicable ECMC Table 915-1 standard in sample WH01.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 8

Number of soil samples exceeding 915-1 0

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

Approximate areal extent (square feet) 100

NA / ND

-- Highest concentration of TPH (mg/kg) 7.1

NA Highest concentration of SAR

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 6

Groundwater

Number of groundwater samples collected 3

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 2

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l)

ND Highest concentration of Toluene (µg/l)

ND Highest concentration of Ethylbenzene (µg/l)

ND Highest concentration of Xylene (µg/l)

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?

On March 28, 2024, two background soil borings (BKG01 & BKG02) were advanced in native material adjacent to the tank battery & wellhead locations. Two soil samples were collected from each background soil boring at depths of approximately 4 ft and 6 ft bgs and were submitted for laboratory analysis of pH and Table 915-1 metals. Analytical results indicated that arsenic, barium, and cadmium were observed in exceedance of the applicable standards. Laboratory analytical results are currently pending of pH in the background soil samples collected.

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

Volume of solid waste (cubic yards) 8

Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

Up to five (5) soil borings will be advanced to confirm and vertically and horizontally delineate the arsenic & cadmium exceedance observed in soil sample SEP01-DL @ 4'.

One soil sample will be collected in the AST01 location and submitted for laboratory analysis of the Full Table 915-1 analytical suite.

Ten (10) groundwater monitoring wells will be installed via direct-push drilling methods to confirm the absence of dissolved-phase hydrocarbon impacts adjacent to and surrounding the excavation where groundwater was encountered in contact with impacted soils along the flowline and at the PWV (GW01 & GW03).

Additionally, supplemental source mass removal activities are needed to remove and delineate remaining hydrocarbon impacted material adjacent to the wellhead (WH01).

The proposed soil boring locations and proposed monitoring well locations are illustrated on Figures 2 & 3.

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 March 28, 2024, approximately 8 cubic yards of impacted material were removed from the tank battery location and transported to the North Weld Waste Management Facility under PDC waste manifests.

Any hydrocarbon impacted material generated during supplemental source mass removal activities will be transported off-site to a licensed disposal facility in accordance with Rules 905 and 906.

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 March 28, 2024, three historic releases were discovered during decommissioning activities at the Hall 42-33 Wellhead, Flowline, and Tank Battery when groundwater was observed in the wellhead excavation, the flowline excavation, and the produced water vessel excavation (PWV). Prior to confirmation sampling, mitigation activities were initiated and to date, approximately 8 cubic yards of impacted material was removed from the wellhead excavation and transported to North Weld Waste Management Facility for disposal under a PDC waste manifest. One soil sample was collected from the base of each excavation (WH01 @ 6', PWV01-B @ 2', & FL01-01 @ 6') and submitted for laboratory analysis of the Full Table 915-1 analytical suite. Analytical results indicated that 1-methylnaphthalene was in exceedance of the applicable standards in soil sample WH01. Additionally, arsenic and cadmium were found to be in exceedance of the applicable standards and above 1.25 times background soil sample concentrations in soil sample SEP01-DL. Analytical results indicated that pH was in exceedance of the applicable standards in soil samples PWV01-W, SEP01-FL, & FLR01. Due to the presence of groundwater, confirmation groundwater samples (GW01-GW03) were collected from each excavation and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,2,4-TMB, TDS, sulfate, & chloride. Analytical results indicated that organic compounds in water were below the applicable standards. Additionally, background soil samples (BKG01 & BKG02) were collected from native material adjacent to the wellhead and submitted for analysis of the Table 915-1 metals & pH. Laboratory results indicated that arsenic, barium, & cadmium were in exceedance of the applicable standards in background soil samples, pH results are currently pending.

Soil Remediation Summary

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> Ex Situ
_____ Bioremediation (or enhanced bioremediation)	Yes _____ Excavate and offsite disposal
_____ Chemical oxidation	_____ If Yes: Estimated Volume (Cubic Yards) _____ 8
_____ Air sparge / Soil vapor extraction	_____ Name of Licensed Disposal Facility or ECMC 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.

Based on the analytical data collected during decommissioning activities, PDC will conduct quarterly groundwater monitoring at the ten proposed monitoring wells until closure criteria are met. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260, chloride and sulfate anions by EPA Method 300.0, and total dissolved solids (TDS) by Method SM 2540C in accordance with Table 915-1.

Following supplemental source mass removal activities at the former wellhead location, additional monitoring wells will be proposed within and surrounding the excavation.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

☒ Quarterly☐ Semi-Annually☐ Annually☐ Other

☐ Request Alternative Reporting Schedule:

☐ Semi-Annually☐ Annually☐ Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

Report Type:

☐ Groundwater Monitoring☐ Land Treatment Progress Report☐ O&M Report☒ Other Confirmation Sampling Summary, 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.

- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the ECMC 1000 Series.
- Source mass removal is ongoing.
- Investigation and delineation is ongoing for pH, arsenic, & cadmium in soil.
- Groundwater monitoring wells will be installed and monitored for natural attenuation.

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: \$ 50000

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 8

E&P waste (solid) description Hydrocarbon impacted soils

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: North Weld Waste Management

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

If YES:

☐ Compliant with Rule 913.h.(1).

☐ Compliant with Rule 913.h.(2).

☐

Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards? _____

Does the previous reply indicate consideration of background concentrations? _____

Does Groundwater meet Table 915-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

RECLAMATION PLAN

RECLAMATION PLANNING

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing.

Following wellhead, flowline, & tank battery decommissioning, the location was be backfilled, compacted, and re-contoured to match preexisting conditions. The location will be reclaimed in accordance with the ECMC 1000 series.

Following supplemental source mass removal activities, the location will be backfilled, compacted, and re-contoured to match preexisting conditions. The location will be reclaimed in accordance with the ECMC 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. 04/15/2024

Proposed date of completion of Reclamation. 04/15/2029

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. 10/19/2023

Actual Spill or Release date, or date of discovery. 03/28/2024

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/11/2024

Proposed site investigation commencement. 07/01/2024

Proposed completion of site investigation. 12/31/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/11/2024

Proposed date of completion of Remediation. 04/15/2029

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 decommissioning and source mass removal activities, supplemental site investigation activities will be conducted to delineate arsenic & cadmium exceedances recorded during decommissioning activities in sample SEP01-DL. In addition, ten monitoring wells will be advanced to evaluate Table 915-1 groundwater constituents within and adjacent to the former excavation extent. Lastly, supplemental source mass removal activities will be initiated to remove and delineate remaining hydrocarbon impacted material in the vicinity of soil sample WH01. Supplemental site investigation activities are proposed to be completed by the end of the fourth quarter 2024.

OPERATOR COMMENT

This Supplemental Form 27 was drafted to summarize confirmation soil sampling field activities and analytical results, as well as native material soil sampling analytical results, conducted at the former Hall 42-33 wellhead, tank battery, and flowline locations.

Following the approval of this form and landowner approval, supplemental site investigation activities will be initiated at the former Hall 42-33 wellhead, tank battery, and flowline location to confirm and delineate arsenic & cadmium concentrations in the vicinity of soil sample SEP01-DL. Supplemental site investigation activities will be conducted to collect a soil sample at the AST01 location for submittal of the Full Table 915-1 analytical suite. Supplemental source mass removal activities will be initiated to remove and delineate hydrocarbon impacted material adjacent to the wellhead.

In addition, PDC will install and conduct quarterly groundwater monitoring at the ten proposed monitoring wells.

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: Remediation Advisor

Submit Date: _____

Email: taspillremediationcontractor@pdce.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: _____

Date: _____

Remediation Project Number: 33411

COA Type

Description

0 COA	

ATTACHMENT LIST

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

Att Doc Num

Name

403835961	SITE INVESTIGATION PLAN
403835962	SITE INVESTIGATION PLAN
403835964	SOIL SAMPLE LOCATION MAP
403835969	PHOTO DOCUMENTATION
403837527	ANALYTICAL RESULTS

Total Attach: 5 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)