

State of Colorado  
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
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Document Number:

403829545

Receive Date:

06/28/2024

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 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 Phone: (303) 860-5800 Mobile: ( )
Address: 1099 18TH STREET SUITE 1500		
City: DENVER	State: CO Zip: 80202	
Contact Person: Karen Olson	Email: taspillremediationcontractor@pdce.com	

## PROJECT, PURPOSE &amp; SITE INFORMATION

## PROJECT INFORMATION

Remediation Project #: 31414 Initial Form 27 Document #: 403441996

## 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 #: 123-11231	County Name: WELD
Facility Name: SMITH-REEVES 27-1		Latitude: 40.368860	Longitude: -104.871750
		** correct Lat/Long if needed: Latitude: 40.368848	Longitude: -104.871767
QtrQtr: NESE	Sec: 27	Twp: 5N	Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE	Facility ID: 485885	API #: _____	County Name: WELD
Facility Name: Smith Reeves 27-1 Wellhead/Flowline		Latitude: 40.366002	Longitude: -104.870828
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NESE	Sec: 27	Twp: 5N	Range: 67W 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? No

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: Monitoring / Sampling - 2,595' SW; Surface Water: Loveland and Greeley Canal - 644' SSW; Occupied Building: 737' ENE; Livestock: 658' ENE; FWS Wetlands: 644' SSW Riverine (R4SBCx); HPH Sensitive Wildlife Habitat: Rule 1202.d: Wellhead & Flowline Within Mule Deer Severe Winter Range.

Flowline Conflict: Wellhead & Flowline within Mule Deer Severe Winter Range.

## 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 Document No. 403698907	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, 2023, field screening and confirmation soil sampling activities were conducted in accordance with the ECOM Rule 911 during the decommissioning of the Smith-Reeves 27-1 wellhead and removal of the associated flowline. On December 29, 2023, it was determined that a historic release was discovered along the flowline when analytical results returned with organic compound exceedances at soil sample locations FL01-05, FL01-06, and FLR02. Due to subcontractor availability, excavation activities were unable to be initiated. As such, no soil was removed from the location.

### 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, 2023, three soil samples (FL01-05, FL01-06, & FLR02) were collected from the flowline source areas at approximately 4 feet below ground surface (bgs). The samples were submitted for laboratory analysis of the full ECOM Table 915-1 analytical suite. Analytical results indicated that site specific COCs include: benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH[C6-C36]), 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, anthracene, benzanthracene, benzopyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, indenopyrene, and pyrene.

#### Proposed Groundwater Sampling

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

If groundwater is encountered during decommissioning and/or abandonment activities, a grab sample will be collected as soon as practical. If contaminated soil is in contact with groundwater or if free product/hydrocarbon sheen are observed, the release will be reported in accordance with Rule 912.b. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260.

#### 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 December 1, 2023, 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, two soil samples (WH01 & FLR01) were collected below the wellhead & flowline riser at approximately 6 ft & 4 ft bgs, respectively, and submitted for laboratory analysis of the full Table 915-1 analytical suite. Four (4) additional soil samples (FL01-01 - FL01-04) were collected every 250 feet along the flowline and at the halfway point. Soil sample (FL01-03) was submitted for laboratory analysis of the full Table 915-1 analytical suite. Analytical results indicated that all compound concentrations were within the acceptable Table 915-1 standards, except for lead in WH01; arsenic, cadmium, & lead in FLR01; EC & selenium in FL01-03.

## SITE INVESTIGATION REPORT

### SAMPLE SUMMARY

**Soil**

Number of soil samples collected 6

Number of soil samples exceeding 915-1 6

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

Approximate areal extent (square feet) 100

**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

**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.

**NA / ND**

ND Highest concentration of TPH (mg/kg)

-- Highest concentration of SAR 3.1

BTEX &gt; 915-1 No

Vertical Extent &gt; 915-1 (in feet) 6

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)

**OTHER INVESTIGATION INFORMATION**☐ Were impacts to adjacent property or offsite impacts identified?☒ Were background samples collected as part of this site investigation?

On December 1, 2023, two background soil samples (BKG01 @ 4' and BKG01 @ 6') were collected from native material topographically up-gradient of the wellhead location and submitted for laboratory analysis of ECMC Table 915-1 Metals, pH, and EC. Analytical results indicated that pH, arsenic, & barium were observed in exceedance of the applicable regulatory standards in native material.

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

Volume of solid waste (cubic yards)

Volume of liquid waste (barrels)

☒ Is further site investigation required?

Based on the final analytical results, supplemental source mass removal activities are proposed to be initiated to remove remaining hydrocarbon impacted material via mechanical excavation adjacent to and below soil samples FL01-05 @ 4', FL01-06 @ 4', & FLR02 @ 4'. Confirmation soil samples will be collected from the base and sidewalls of the final excavation extents and submitted for laboratory analysis of the ECMC approved COCs.

Additionally, analytical results indicated that lead was in exceedance of the applicable standards in soil sample WH01; cadmium and lead were in exceedance of the applicable standards in soil sample FLR01. As such, up to five (5) soil borings will be advanced to confirm as well as vertically and horizontally delineate the cadmium & lead exceedances observed in soil samples WH01 @ 6' & FLR01 @ 4'.

Analytical results indicated that EC & selenium were in exceedance of the applicable standards in soil sample FL01-03. As such, up to five (5) soil borings will be advanced to confirm as well as vertically and horizontally delineate the EC & selenium exceedances observed in soil sample FL01-03 @ 4'.

Up to five (5) additional background soil borings will be advanced in native material adjacent to the final wellhead excavation extent and soil sample FL01-03 to evaluate EC, cadmium, lead, & selenium in native material. The proposed soil boring locations are illustrated on Figures 3 & 4.

Analytical results will be summarized 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.

Any hydrocarbon impacted material 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 December 29, 2023, a historic release was discovered following receipt of final analytical results from soil samples collected during decommissioning activities at the Smith Reeves 27-1 Wellhead. On December 1, 2024, as per the approved proposed soil sampling plan, two soil samples (WH01 & FLR01) were collected below the wellhead & flowline riser at approximately 6 ft bgs & 4 ft bgs. Seven (7) soil samples (FL01-01 - FL01-06 & FLR02) were collected along the flowline, at the halfway point, at the significant direction changes, and at the separator flowline riser. Soil samples (WH01, FLR01, FL01-03, FL01-05, FL01-06, & FLR02) were submitted for laboratory analysis of the full Table 915-1 analytical suite. Analytical results indicated that organic and inorganic compound concentrations were in compliance with the applicable Table 915-1 standards, with exception to the following samples:

-WH01: lead  
-FLR01: cadmium & lead  
-FL01-03: EC & selenium  
-FL01-05: benzantracene  
-FL01-06: benzantracene  
-FLR02: benzantracene

Supporting documentation was included on the previously submitted Supplemental Form 27 Document No. 403698907

## **Soil Remediation Summary**

☐ In Situ

☐ Ex Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

\_\_\_\_\_ Excavate and offsite disposal

\_\_\_\_\_ Chemical oxidation

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_

\_\_\_\_\_ 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.

Groundwater was not encountered during decommissioning of the wellhead and removal of the flowline.

## 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 

### 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 and confirmation sampling will be conducted to remove impacted soil adjacent to the flowline release.
- Investigation and delineation of EC, cadmium, lead, & selenium is ongoing.
- Native material assessment of EC, cadmium, lead, & selenium is ongoing.
- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the ECMC 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: \$

### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation?

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards

E&P waste (solid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

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?

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 decommissioning and flowline removal activities, 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 additional 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? \_\_\_\_\_

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. 12/01/2023

Proposed date of completion of Reclamation. 12/01/2028

## 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. 04/19/2023

Actual Spill or Release date, or date of discovery. 12/29/2023

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/13/2023

Proposed site investigation commencement. 07/01/2024

Proposed completion of site investigation. 09/30/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/01/2023

Proposed date of completion of Remediation. 12/01/2028

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 source mass removal, the proposed date of site investigation commencement and the proposed date of the completion of site investigation was adjusted to span through the third quarter of 2024. The proposed supplemental site investigation activities will be completed following land access negotiations with the land owner and crew availability.

## **OPERATOR COMMENT**

This form is being submitted as a second quarter 2024 timeline update for the Smith-Reeves 27-1 Wellhead. Per ECMC request, tables and figures previously submitted have not been included with this form submittal. Please refer to ECMC document no. 403698907 for previously submitted tables and figures.

Following landowner approval and crew availability, supplemental source mass removal activities will be initiated along the former Smith-Reeves 27-1 flowline at the location of soil samples FL01-05, FL01-06, and FLR02. Additionally, supplemental site investigation activities will be conducted to assess EC, cadmium, lead, and/or selenium concentrations adjacent to and below the former wellhead excavation and along the flowline at soil sample FL01-03. Sequentially, a supplemental site investigation will be conducted to assess EC, cadmium, lead, and selenium in native material. 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: 06/28/2024

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: Taylor Robinson

Date: 08/20/2024

Remediation Project Number: 31414

### **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**

403829545	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403894818	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 2 Files

## **General Comments**

### **User Group**

### **Comment**

### **Comment Date**

		Stamp Upon Approval
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Total: 0 comment(s)