

State of Colorado  
Energy & Carbon Management Commission

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Document Number:  
403868956

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 ECOM 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>	<b>Phone Numbers</b>
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>		Mobile: <u>( )</u>
Contact Person: <u>Karen Olson</u>	Email: <u>taspillremediationcontractor@pdce.com</u>	

**PROJECT, PURPOSE & SITE INFORMATION**

**PROJECT INFORMATION**

Remediation Project #: 10053 Initial Form 27 Document #: 401208325

**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>448930</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Nelson 11,21-33</u>	Latitude: <u>40.363197</u>	Longitude: <u>-104.904219</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWNW</u>	Sec: <u>33</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 Agriculture

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**

Residential buildings are located approximately 697 feet east of tank battery location. Closest surface water is located approximately 965 feet southwest of the tank battery 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 Monitoring Report.	Completion of Site Investigation plan.
Yes	SOILS	Refer to ECMC Doc No. 401624926	Completion of excavation activities.

**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 January 9, 2017, approximately 12 barrels of oil were released inside secondary containment at the Nelson 11, 21-33 tank battery. Approximately 210 cubic yards of impacts material were removed and transported to the North Weld Landfill in Ault, Colorado for disposal under PDC waste manifests. A Supplemental Form 19 was submitted to the ECMC on January 19, 2017, under Doc# 401188021. The ECMC issued Spill Point ID: 448930 to the project.

**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 January 10 and 11, 2017, six (6) confirmation soil samples were collected from the final extent of the excavation area. Based on soil analytical results, the extent of petroleum hydrocarbon impacts in soil was successfully defined and removed during excavation activities. No further soil sampling is required.

**Proposed Groundwater Sampling**

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

Five (5) temporary monitoring wells will be installed via direct push drilling methods to delineate the extent of dissolved phase hydrocarbon impacts.

**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 ):

**SITE INVESTIGATION REPORT**

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 6  
Number of soil samples exceeding 915-1 0  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 945

### NA / ND

ND Highest concentration of TPH (mg/kg) \_\_\_\_\_  
NA Highest concentration of SAR \_\_\_\_\_  
BTEX > 915-1 No  
Vertical Extent > 915-1 (in feet) 8

### Groundwater

Number of groundwater samples collected 1  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 10  
Number of groundwater monitoring wells installed 0  
Number of groundwater samples exceeding 915-1 1

-- Highest concentration of Benzene (µg/l) 210  
-- Highest concentration of Toluene (µg/l) 350  
-- Highest concentration of Ethylbenzene (µg/l) 6.2  
-- Highest concentration of Xylene (µg/l) 360  
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?

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

Volume of solid waste (cubic yards) 210      Volume of liquid waste (barrels) 4360

Is further site investigation required?

Between January 2017, and June 2017, ten (10) monitoring wells (BH01 – BH10) were advanced within and surrounding the former excavation extent to confirm the absence of dissolved phase hydrocarbon impacts and establish point of compliance (POC) on site. Following supplemental source mass removal activities, between July 1, and July 23, 2020, four replacement monitoring wells (BH02R – BH03R, BH04R-2, and BH06R) were installed to replace monitoring wells destroyed during excavation and reclamation activities. Additionally, one source monitoring well (BH11) was installed to confirm the absence of dissolved phase hydrocarbon impacts.

## 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 January 9, 2017, an oil release occurred within secondary containment at the Nelson 11, 21-33 tank battery due to a cracked drain valve. Approximately 210 cubic yards of impacted material were removed and transported to the North Weld County Landfill in Ault, Colorado for disposal under PDC waste manifests. Between April 24 and April 29, 2020, approximately 500 cubic yards of impacted material were excavated 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.

Monitored natural attenuation (MNA) was selected as the remediation strategy for the site during the second quarter 2017 and continued until fourth quarter 2017. Based on persisting elevated benzene concentrations, enhance fluid recovery (EFR) and air sparge (AS) activities were initiated as the selected remediation strategy beginning the first quarter 2018 and continued through April 2020. Following supplemental source mass removal activities conducted in April 2020, MNA was selected as remediation strategy between the third quarter 2020 and third quarter 2023. Based on persisting benzene concentrations in monitoring well BH11, EFR/AS activities were reinitiated as the selected remediation strategy for this location between August 8, 2023, and October 9, 2023. MNA was re-initiated as the selected remediation strategy for the fourth quarter 2023 and remained the selected remediation strategy through the third quarter 2024.

Based on persisting benzene concentrations in monitoring well BH11, remaining source mass will be removed via mechanical excavation in the vicinity of BH11. Supplemental source mass removal activities are tentatively scheduled for August 2024. Based on the 2017 release being strictly oil, PDC is requesting to submit confirmation soil samples collected from the final excavation extent for laboratory analysis of the Table 915-1 Organic Compounds in Soil and TPH.

**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) _____ 710
_____ 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

No \_\_\_\_\_ 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.

Groundwater monitoring will continue on a quarterly basis at the 11 site monitoring wells (BH01, BH02R, BH03R, BH04R-2, BH05, BH06R, and BH07 – BH11). Groundwater samples will be submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260B in accordance with Table 915-1. Per the approved Supplemental Form 27s (Document Nos. 402874840 and 403212551), analysis of total dissolved solids (TDS) and chloride anions were removed from the quarterly sampling plan following the fourth quarter 2021 and sulfate anions were removed from the quarterly sampling plan following the fourth quarter 2022.

Third quarter 2024 analytical results indicated that the benzene concentration was in exceedance of the applicable ECMC Table 915-1 regulatory standard in monitoring well BH11. Organic compound concentrations were in compliance with the applicable regulatory standards in the remaining ten monitoring well locations.

# 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 Supplemental 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.

Financial assurance information was included in the second quarter 2024 Supplemental Form 27 (Document No. 403792644). This section and estimate will be updated on an annual basis until closure criteria are achieved.

Operator anticipates the remaining cost for this project to be: \$ 10000

## 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:

Volume of E&P Waste (solid) in cubic yards 710

E&P waste (solid) description E&P contaminated soil

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: North Weld Landfill

Volume of E&P Waste (liquid) in barrels 4630

E&P waste (liquid) description Petroleum hydrocarbon impacted groundwater

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Licensed 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.

The excavation was backfilled and re-contoured to match pre-existing conditions. The facility was decommissioned and will be reclaimed in accordance with the ECMC 1000 Series rules.

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. 01/10/2017

Proposed date of completion of Reclamation. 10/30/2026

## 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. 01/10/2017

Actual Spill or Release date, or date of discovery. 01/09/2017

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/10/2017

Proposed site investigation commencement. 08/12/2024

Proposed completion of site investigation. 09/12/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 01/10/2017

Proposed date of completion of Remediation. 10/30/2026

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 persisting benzene concentrations in monitoring well BH11, remaining source mass will be removed via mechanical excavation in the vicinity of BH11. Supplemental source mass removal activities are tentatively scheduled for August 2024.

**OPERATOR COMMENT**

This Supplemental Form 27 was submitted to summarize quarterly groundwater monitoring activities and analytical results collected during the third quarter 2024 at the former Nelson 11, 21-33 tank battery location.

Third quarter 2024 analytical results indicated that the benzene concentration was in exceedance of the applicable ECMC Table 915-1 regulatory standard in monitoring well BH11. Organic compound concentrations were in compliance with the applicable regulatory standards in the remaining ten monitoring well locations.

Based on persisting benzene concentrations in monitoring well BH11, remaining source mass will be removed via mechanical excavation in the vicinity of BH11. Supplemental source mass removal activities are tentatively scheduled for August 2024. Based on the 2017 release being strictly oil, PDC is requesting to submit confirmation soil samples collected from the final excavation extent for laboratory analysis of the Table 915-1 Organic Compounds in Soil and TPH.

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: 10053

**COA Type**

**Description**

<u>COA Type</u>	<u>Description</u>
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**

403869893	MONITORING REPORT
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Total Attach: 1 Files

**General Comments**

**User Group**

**Comment**

**Comment Date**

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)