

# State of Colorado Oil and Gas Conservation Commission

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Report taken by:

Jason Kosola

## 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>	<b>Phone Numbers</b>
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>COGCCSpillRemediation@pdce.com</u>	Mobile: <u>( )</u>

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 21320 Initial Form 27 Document #: 402892598

#### 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>472240</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Peak 1</u>	Latitude: <u>40.443868</u>	Longitude: <u>-104.593302</u>	
** correct Lat/Long if needed: Latitude: <u>40.443869</u>		Longitude: <u>-104.593472</u>	
QtrQtr: <u>SENW</u>	Sec: <u>31</u>	Twp: <u>6N</u>	Range: <u>64W</u>
Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

#### SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Residential / 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: Monitoring -1,105' SSE; Surface Water: Lone Tree Creek - 485' NE, Occupied Building: 280' SSE; Livestock: 90' E; FWS Wetlands: 485' NE Riverine (R5UBH); HPH: located within Aquatic Native Species Conservation Waters buffer along Lone Tree Creek.

# 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 & 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.

Between March 9 and 11, 2022, field screening and confirmation soil sampling was conducted in accordance with the COGCC Rule 911 during the decommissioning and closure of the Peak 1 tank battery (Figure 1). Based on analytical results, it was determined that a historic release was discovered adjacent to and beneath the former produced water vessel (PWV). Following the discovery of the release, mitigation activities were initiated and to date, approximately 95.5 cubic yards of impacted material was removed at the PWV excavation. Additionally, approximately 2 cubic yards of impacted material was removed at the separator dump-line, and approximately 0.5 cubic yards of impacted material was removed at the meter house as part of general housekeeping decommissioning activities. All material removed was transported to the North Weld Waste Management Facility in Ault, CO for disposal under PDC waste manifests. On March 9, 2022, one soil sample (SS01 @ 10') was collected from impacted source below the PWV at approximately 10 feet bgs. The sample was submitted for laboratory analysis of the full COGCC Table 915-1 analyte suite. Analytical results indicated COCs for the historic release below the PWV include BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36), anthracene, chrysene, fluorene, 1-M, 2-M, EC, and SAR.

## 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 ):

Between March 9 and 11, 2022, eleven (11) soil samples (SS01-SS04, SS06, SS09-SS10, SS12-SS13, & SS15-SS16) were collected from the base and sidewalls of the excavation at depths ranging between 5 feet and 15 feet bgs and were submitted for laboratory analysis of the above referenced COCs. In addition, soil sample SS05 was unintentionally submitted for laboratory analysis of PAHs, EC, and SAR, while soil sample SS07 was submitted for laboratory analysis of BTEX, TMBs, naphthalene, and TPH (C6-C36). Additionally, one soil sample (SS11) was collected from the sidewall of the excavation at a depth of 2.5 feet bgs and was submitted for laboratory analysis of pH, EC, SAR, and Boron. Soil sample SS05 was submitted for laboratory analysis of PAHs, EC, and SAR. Analytical results indicated concentrations were below applicable COGCC Table 915-1 standards.

### 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 ):

Additionally, two (2) soil samples (MH01-B & MH01-E) were collected below the former meter house at 1 foot and 0.5 feet. On March 10, 2022, two soil samples (SEP01-DL-E) were collected below the former separator dump-line at 2.5 feet and 5 feet. Samples were submitted for the full COGCC Table 915-1 analytical suite. Analytical results indicated that metal concentrations were in exceedance of the applicable standards in sample MH01-B.

During initial closure activities conducted on March 9, 2022, soil encountered on-site and below production equipment was inspected and screened for volatile organic compound (VOC) concentrations using a PID. Per the approved proposed soil sampling plan, samples were collected adjacent to the above ground storage tank and separator flowline. The samples were submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH. Analytical results indicated that organic concentrations were below the COGCC Table 915-1 standards.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 20

Number of soil samples exceeding 915-1 3

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

Approximate areal extent (square feet) 293

### NA / ND

-- Highest concentration of TPH (mg/kg) 6110

-- Highest concentration of SAR 17.7

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 March 10, 2022, five (5) background soil samples (BKG01) were collected at approximately 1 foot, 2.5 feet, 4 feet, 5 feet, and 10 feet, bgs from native material adjacent to the tank battery. All background soil samples were submitted for analysis of the COGCC Table 915-1 metals. Analytical results indicated that arsenic, barium, and selenium were in exceedance of the applicable regulatory standards in native soil adjacent to the wellhead.

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

Volume of solid waste (cubic yards) 98

Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

Due to a miscommunication with the laboratory, sample SS07 collected from the final PWV excavation extent at 5 feet bgs was unable to be analyzed for anthracene, chrysene, fluorene, 1-M, 2-M, EC, and SAR. As such, one soil boring will be advanced to 5 feet bgs in native material directly adjacent to the former PWV excavation extent to confirm no exceedances of the COGCC Table 915-1 standards are present following source mass removal activities. The soil sample will be submitted for laboratory analysis of the COGCC approved COCs.

Up to four (4) additional background soil borings will be advanced to approximately 10 feet bgs. The background soil borings will be advanced adjacent to the former tank battery to evaluate Table 915-1 metals. Additionally, four (4) soil borings will be advanced adjacent to and below the former meter house to vertically and horizontally delineate cadmium concentrations in native material. The proposed background soil boring locations are illustrated on Figure

## 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 9 and 11, 2022, approximately 98 cubic yards of impacted material were excavated below and adjacent to the former PWV, meter house, and separator dump-line and was 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.

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

## **Soil Remediation Summary**

☐ In Situ

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

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

\_\_\_\_\_ Air sparge / Soil vapor extraction

\_\_\_\_\_ Natural Attenuation

\_\_\_\_\_ Other \_\_\_\_\_

☒ Ex Situ

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

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 98

\_\_\_\_\_ Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_

\_\_\_\_\_ Excavate and onsite remediation

\_\_\_\_\_ 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 or mitigation activities conducted between March 9 and 11, 2022, at the Peak 1 tank battery.

## 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 Sample Summary, Analyte Reduction Request, 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.

- Investigation and delineation is on-going for soil.
- Source mass removal has been completed.
- 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: \$ 25000

### 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 98

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 tank battery decommissioning 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. 03/09/2022

Proposed date of completion of Reclamation. 07/06/2027

## 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. 09/20/2021

Actual Spill or Release date, or date of discovery. 03/09/2022

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/29/2021

Proposed site investigation commencement. 10/01/2022

Proposed completion of site investigation. 12/31/2022

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/09/2022

Proposed date of completion of Remediation. 07/06/2027

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

Based on analytical results for the waste characterization sample SS01 collected from the PWV source area, PDC is requesting that the COCs for the historic release discovered at the Peak 1 tank battery separator release be reduced to the following: BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36), anthracene, chrysene, fluorene, 1-M, 2-M, EC, and SAR.

Following the approval of this form and landowner approval, PDC will conduct supplemental site investigation activities at the former Peak 1 tank battery to evaluate COGCC Table 915-1 metals in native material and collect a confirmation sample in the location of SS07 to evaluate anthracene, chrysene, fluorene, 1-M, 2-M, EC, and SAR.

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: 07/11/2022

Email: COGCCSpillRemediation@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: 09/22/2022

Remediation Project Number: 21320

## Condition of Approval

### 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

403078602	FORM 27-SUPPLEMENTAL-SUBMITTED
403079127	PHOTO DOCUMENTATION
403097631	SOIL SAMPLE LOCATION MAP
403097632	SOIL SAMPLE LOCATION MAP
403097633	SOIL SAMPLE LOCATION MAP
403101331	SITE INVESTIGATION PLAN
403101334	ANALYTICAL RESULTS

Total Attach: 7 Files

## General Comments

### User Group

### Comment

### Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)