

# State of Colorado Oil and Gas Conservation Commission

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Document Number:

402672112

Receive Date:

04/28/2021

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

### 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 #: 16640Initial Form 27 Document #: 402590108

#### PURPOSE INFORMATION

- |  |  |
|--|--|
| <input type="checkbox"/> 901.e. Sensitive Area Determination                                       | <input type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water                   |
| <input checked="" type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure                  | <input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b. |
| <input type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation                            | <input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project                                  |
| <input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste                      | <input type="checkbox"/> Rule 906.c.: Director request   |
| <input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure | <input checked="" type="checkbox"/> Other <u>Wellhead Closure and Flowline Removal</u>                     |

#### SITE INFORMATION

N Multiple Facilities ( in accordance with Rule 909.c. )

|  |                    |                            |                               |
|--|--------------------|----------------------------|-------------------------------|
| Facility Type: <u>WELL</u>                     | Facility ID: _____ | API #: <u>123-19533</u>    | County Name: <u>WELD</u>      |
| Facility Name: <u>LEAFGREN 23-17</u>           |                    | Latitude: <u>40.485000</u> | Longitude: <u>-104.690530</u> |
| ** correct Lat/Long if needed: Latitude: _____ |                    | Longitude: _____           |                               |
| QtrQtr: <u>NESW</u>                            | Sec: <u>17</u>     | Twp: <u>6N</u>             | Range: <u>65W</u>             |
| Meridian: <u>6</u>                             |                    | Sensitive Area? <u>Yes</u> |                               |

#### SITE CONDITIONS

General soil type - USCS Classifications SMMost Sensitive Adjacent Land Use AgricultureIs domestic water well within 1/4 mile? YesIs surface water within 1/4 mile? YesIs groundwater less than 20 feet below ground surface? No

#### Other Potential Receptors within 1/4 mile

A irrigation well is located approximately 1,191 feet northwest of the location. The Greeley No. 2 canal is located approximately 1,030 feet southeast of the location. FWS Wetlands classified as riverine habitat are located approximately 1,030 feet southeast of the 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             |
|-----------|----------------|-------------------------------------|----------------------------|
| No        | SOILS          | Refer to Tables 1-3 and Figures 1&2 | 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.

In accordance with COGCC Rule 911, this form serves as notification for decommissioning and/or abandonment of the production facility or the off-location wellhead and flowline. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning. Field observations and photo documentation will be recorded in a field inspection form for submittal to the COGCC.

## 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 ):

Grab soil samples will be collected below and/or adjacent to applicable facility equipment, as defined in the Rule 911.a.(4) guidance document (1/4/21), for field screening purposes. Discrete soil samples will be collected for laboratory analysis either in any area of observed hydrocarbon impacts, or in the sample locations designated by the COGCC. GPS data will be collected for all soil sample locations. Soil samples will be submitted for laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH C6-C36) by EPA Methods 8260B and 8015. Additionally, soil sample(s) will be collected in the area most likely to be impacted by produced water to confirm soil suitability for reclamation. The sample(s) will be submitted for laboratory analysis of electrical conductivity (EC), pH, sodium adsorption ratio (SAR), and boron by saturated paste and hot water soluble extraction methods. Refer to the Proposed Sample Location Map.

### 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 ):

During the removal of any off-location flowlines, an assessment will be conducted every 200 to 300 linear feet, and/or at any drainage or surface water crossings. At each assessment location, the flowline and adjacent sub-surface will be visually inspected for any indicators of potential failure and hydrocarbon impacts. Soils will be field screened below the flowline and if suspected impacts are observed, a soil sample will be submitted for laboratory analysis of BTEX and TPH (C6-C36) by EPA Methods 8260B and 8015. GPS data and photo documentation will be recorded for each inspection/sample location. A map illustrating the flowline assessment will be provided in the Supplemental Form 27.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 2

Number of soil samples exceeding 910-1 0

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 100

### NA / ND

ND Highest concentration of TPH (mg/kg)

-- Highest concentration of SAR 1.3

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 4

### 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 910-1

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 910-1

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)

Volume of liquid waste (barrels)

☐ Is further site investigation required?

# 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.

No soil was removed from the location during wellhead closure activities and the removal of the associated flowline.

## 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.

Soil encountered adjacent to and surrounding the wellhead and below the flowline riser was visually inspected and field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). In addition, field screening samples were collected, and inspections conducted along the flowline every 250 feet and at two additional locations on each side of the irrigation ditch (FL01-ND and FL01-SD) where the flowline crossed under. Per the approved proposed soil sampling plan, one soil sample was collected below the flowline riser (FLR01) at approximately 4 feet below ground surface (bgs). Based on field observations and photos collected during cut and cap activities (Attachment B), the wellhead was not uncovered during sampling activities to reduce risk of potential damage to the wellhead. One soil sample was collected adjacent to the former wellhead location (WH01) at approximately 2.5 feet bgs. Soil sample FLR01 was submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, and TPH (C6-C36) and sample WH01 was submitted for analysis of pH, electrical conductivity (EC), sodium adsorption ratio (SAR), and boron. Per the approved Initial Form 27, trimethylbenzene (TMB) analysis was not included for this location as soil sampling was conducted prior to March 4, 2021. Analytical results indicated that organic compounds and soil suitability constituents were in compliance with the applicable COGCC Table 915-1 Protection of Groundwater SSLs. Analytical results are summarized in Tables 1 and 2, and GPS coordinates and field screened VOC concentrations are summarized in Table 3. Field screening and laboratory sample locations collected at the wellhead and along the flowline are illustrated on Figures 1 and 2. The laboratory report is included as Attachment A and the wellhead closure and flowline removal field notes and photo log are included as Attachment B.

## Soil Remediation Summary

### ☐ In Situ

- \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )
- \_\_\_\_\_ Chemical oxidation
- \_\_\_\_\_ Air sparge / Soil vapor extraction
- \_\_\_\_\_ Natural Attenuation
- \_\_\_\_\_ Other \_\_\_\_\_

### ☐ Ex Situ

- \_\_\_\_\_ Excavate and offsite disposal
- \_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_
- \_\_\_\_\_ 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.

## REMEDIATION PROGRESS UPDATE

### PERIODIC REPORTING

**Frequency:** ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Wellhead P&A and Flowline Removal Closure Request

**Report Type:** ☐ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report

☒ Other Wellhead P&A and Flowline Removal Closure Request

### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? No

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 \_\_\_\_\_

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: \_\_\_\_\_

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_

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? Yes

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? \_\_\_\_\_

Does Groundwater meet Table 910-1 standards? Yes

Is additional groundwater monitoring to be conducted? No

## 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 and flowline abandonment 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 approve the seed mix? \_\_\_\_\_

If NO, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

## IMPLEMENTATION SCHEDULE

### **PRIOR DATES**

Date of Surface Owner notification/consultation, if required. 10/12/2020

Actual Spill or Release date, if known. \_\_\_\_\_

### **SITE INVESTIGATION DATES**

Date of Initial Actions described in Site Investigation Plan (start date). 02/08/2021

Date of commencement of Site Investigation. 03/03/2021

Date of completion of Site Investigation. 03/03/2021

### **REMEDIAL ACTION DATES**

Date of commencement of Remediation. 03/03/2021

Date of completion of Remediation. 03/03/2021

### **SITE RECLAMATION DATES**

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

**OPERATOR COMMENT**

Based on the analytical results and field observations recorded during the closure and abandonment of the Leafgren 23-17 wellhead and associated flowline, PDC is submitting a closure request for this location.

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: ` 04/28/2021

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: 04/29/2021

Remediation Project Number: 16640

**Condition of Approval****COA Type****Description**

|       |   |
|-------|---|
|       | <p>Based on the information presented, it appears that no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required.</p> <p>The surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.</p> |
| 1 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**

|           |                                |
|-----------|--------------------------------|
| 402672112 | FORM 27-SUPPLEMENTAL-SUBMITTED |
| 402672176 | ANALYTICAL RESULTS             |
| 402672178 | SOIL SAMPLE LOCATION MAP       |
| 402673419 | SOIL SAMPLE LOCATION MAP       |
| 402673452 | PHOTO DOCUMENTATION            |

Total Attach: 5 Files

**General Comments****User Group****Comment****Comment Date**

|  |  |                     |
|--|--|---------------------|
|  |  | Stamp Upon Approval |
|--|--|---------------------|

Total: 0 comment(s)