

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:  
402390273  
Receive Date:  
05/06/2020

Report taken by:  
Candice (Nikki) Graber

Site Investigation and Remediation Workplan (Initial 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: PDC ENERGY INC	Operator No: 69175	<b>Phone Numbers</b>
Address: 1775 SHERMAN STREET - STE 3000		Phone: (303) 860-5800
City: DENVER State: CO Zip: 80203		Mobile: ( )
Contact Person: Karen Olson	Email: COGCCSpillRemediation@pdce.com	

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 15493 Initial Form 27 Document #: 402390273

**PURPOSE INFORMATION**

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input checked="" type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
<input 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 checked="" 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 type="checkbox"/> Other _____

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

Facility Type: TANK BATTERY	Facility ID: 447565	API #: _____	County Name: WELD
Facility Name: REYNOLDS 1,2	Latitude: 40.369633	Longitude: -104.675364	
	** correct Lat/Long if needed: Latitude: 40.369622	Longitude: -104.675409	
QtrQtr: NWSW	Sec: 28	Twp: 5N	Range: 65W Meridian: 6 Sensitive Area? Yes

**SITE CONDITIONS**

General soil type - USCS Classifications SM      Most Sensitive Adjacent Land Use Ranch

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**

FWS Wetlands are located approximately 83 feet west of the location. Occupied buildings are located approximately 416 feet northwest of the location. There are no CPW Sensitive Wildlife Habitats identified within a 1/4-mile radius.

# SITE INVESTIGATION PLAN

## TYPE OF WASTE:

- |                                               |                                                      |                                        |
|-----------------------------------------------|------------------------------------------------------|----------------------------------------|
| <input checked="" type="checkbox"/> E&P Waste | <input type="checkbox"/> Other E&P Waste             | <input type="checkbox"/> Non-E&P Waste |
| <input type="checkbox"/> Produced Water       | <input type="checkbox"/> Workover Fluids             |                                        |
| <input checked="" type="checkbox"/> Oil       | <input type="checkbox"/> Tank Bottoms                |                                        |
| <input type="checkbox"/> Condensate           | <input type="checkbox"/> Pigging Waste               |                                        |
| <input type="checkbox"/> Drilling Fluids      | <input type="checkbox"/> Rig Wash                    |                                        |
| <input type="checkbox"/> Drill Cuttings       | <input type="checkbox"/> Spent Filters               |                                        |
|                                               | <input type="checkbox"/> Pit Bottoms                 |                                        |
|                                               | <input type="checkbox"/> Other (as described by EPA) |                                        |

## DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	Refer to Figure 1 and Table 2.	Implementation of groundwater assessment plan.
Yes	SOILS	Refer to Figure 1 and Table 1.	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 April 22, 2020, a historic release was discovered below the former Reynolds 1, 2 tank battery during reclamation activities. Following the discovery, excavation activities were initiated and approximately 1,020 cubic yards of impacted material were removed and transported to the North Weld Waste Management Facility and Buffalo Ridge Landfill for disposal under PDC waste manifests.

## 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 April 23 and May 1, 2020, 34 soil samples (SS01 - SS34) were collected from the sidewalls and base of the excavation at depths ranging between 1.5 and 3 feet below ground surface (bgs). The soil samples were submitted to Summit Scientific Laboratories (Summit) for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by EPA Method 8260B, and TPH - diesel range organics (DRO) by EPA Method 8015. Analytical results indicated that organic compound concentrations were below the applicable COGCC Table 910-1 standards in the soil samples collected from the final excavation extent. The final excavation extent and sample locations are illustrated on Figure 1. Soil analytical results are summarized in Table 1 and the laboratory reports are included in Attachment A.

### Proposed Groundwater Sampling

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

During initial excavation activities, groundwater was encountered at approximately 1.5 feet bgs. Following the completion of source mass removal activities, one groundwater sample (GW01) was collected from the excavation on May 4, 2020, and submitted to Summit for analysis of BTEX by EPA Method 8260. Analytical results indicated that BTEX concentrations were below the applicable COGCC Table 910-1 groundwater standards. The groundwater sample is illustrated on Figure 1 and groundwater analytical results are summarized in Table 2. The laboratory report is included in Attachment A.

### 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 ):

Eight (8) monitoring wells will be installed via direct-push drilling methods to confirm the absence of dissolved-phase hydrocarbon impacts within and surrounding the former excavation extent. Proposed monitoring well locations are illustrated on Figure 2.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 34

Number of soil samples exceeding 910-1 1

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

Approximate areal extent (square feet) 10294

### NA / ND

-- Highest concentration of TPH (mg/kg) 1510

NA Highest concentration of SAR         

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 3

### Groundwater

Number of groundwater samples collected 1

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 910-1 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

0 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) 1020

Volume of liquid waste (barrels) 3210

Is further site investigation required?

Eight (8) monitoring wells will be installed via direct-push drilling methods to confirm the absence of dissolved-phase hydrocarbon impacts within and surrounding the former excavation extent. Proposed monitoring well locations are illustrated on Figure 2.

# REMEDIAL ACTION PLAN

## SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Between April 22 and May 1, 2020, approximately 1,020 cubic yards of impacted material were removed and transported off site for disposal. As previously described, confirmation soil samples collected from the final excavation extent indicated that unsaturated and saturated hydrocarbon impacted material was successfully removed by excavation activities.

## 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.

Eight (8) monitoring wells will be installed via direct-push drilling methods within and surrounding the former excavation extent. A remediation strategy will be selected following the evaluation of groundwater 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) 1020
- 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.

Based on the analytical data collected during source mass removal activities, PDC will conduct quarterly groundwater monitoring at the eight proposed monitoring wells until closure criteria are met.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

Frequency:  Quarterly  Semi-Annually  Annually  Other \_\_\_\_\_

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

Other \_\_\_\_\_

## 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 1020

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

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

Non-COGCC Disposal Facility: North Weld Waste Management Facility and Buffalo Ridge Landfill

Volume of E&P Waste (liquid) in barrels 3210

E&P waste (liquid) description Impacted groundwater

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

Non-COGCC Disposal Facility: NGL Energy Disposal Facility

## 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-graded to match pre-existing conditions. The facility was decommissioned and will be reclaimed in accordance with the COGCC 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 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. \_\_\_\_\_

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

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/22/2020

Date of commencement of Site Investigation. 04/22/2020

Date of completion of Site Investigation. \_\_\_\_\_

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 04/22/2020

Date of completion of Remediation. \_\_\_\_\_

### SITE RECLAMATION DATES

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

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

### OPERATOR COMMENT

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: 05/06/2020

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: Candice (Nikki) Graber

Date: 05/07/2020

Remediation Project Number: 15493

### COA Type

### Description

	The Operator shall conduct monitoring well installation in accordance with this approved workplan and Rules 909. and 910 within 60 days. A subsequent Form 27 shall be submitted within 45 days of work being completed.
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 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.

<u>Att Doc Num</u>	<u>Name</u>
402390273	FORM 27-INITIAL-SUBMITTED
402390919	ANALYTICAL RESULTS
402390920	SOIL SAMPLE LOCATION MAP
402390921	SITE INVESTIGATION PLAN

Total Attach: 4 Files

### General Comments

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

Total: 0 comment(s)