

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:

402334959

Receive Date:

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

Report taken by:

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>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80203</u>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSpillRemediation@pdce.com</u>	
		Phone: <u>(303) 860-5800</u>
		Mobile: <u>( )</u>

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**

Remediation Project #: 7945 Initial Form 27 Document #: 2145949

**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 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 type="checkbox"/> Other _____

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

Facility Type: <u>LOCATION</u>	Facility ID: <u>319594</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>H &amp; S-64N65W 6NWSW</u>	Latitude: <u>40.339715</u>	Longitude: <u>-104.713419</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>6</u>	Twp: <u>4N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

**SITE CONDITIONS**

General soil type - USCS Classifications SW Most Sensitive Adjacent Land Use DRY LAND

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**

SURFACE WATER ~1,855' N, RESIDENTIAL BLDG ~405' SW, WATER WELL ~580' SW AND GROUNDWATER ~14' BGS.

# 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 checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids             | _____                                  |
| <input 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
	GROUNDWATER	REFER TO FIGURE 3 AND TABLE 2	DRILLING AND GROUNDWATER SAMPLING
	SOILS	REFER TO FIGURE 2 AND TABLE 1	EXCAVATION AND 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.

A FORM 19 WAS SUBMITTED ON JULY 29, 2013. COGCC ASSIGNED SPILL TRACKING NUMBER 2145651 FOR THIS LOCATION. AN AERIAL MAP OF THE SITE IS INCLUDED ON FIGURE 1.

## **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 ):

### **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 ):

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 19  
Number of soil samples exceeding 910-1 6  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 3000

### NA / ND

-- Highest concentration of TPH (mg/kg) 1810  
NA Highest concentration of SAR           
BTEX > 910-1 No  
Vertical Extent > 910-1 (in feet) 22

### Groundwater

Number of groundwater samples collected 15  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 14'  
Number of groundwater monitoring wells installed 15  
Number of groundwater samples exceeding 910-1 8

-- Highest concentration of Benzene (µg/l) 1000  
-- Highest concentration of Toluene (µg/l) 6500  
-- Highest concentration of Ethylbenzene (µg/l) 680  
-- Highest concentration of Xylene (µg/l) 13000  
NA 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?

Site investigation activities conducted in May and June 2019 indicate that hydrocarbon impacts in soil and groundwater extend off-site to the north. Supplemental off-site investigation activities will be conducted to delineate the remaining hydrocarbon impacts in groundwater and soil north of the location.

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?

Supplemental site investigation activities will be conducted to delineate the remaining hydrocarbon impacts in groundwater and soil and establish down- and cross-gradient point of compliance.

# 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.

The source area was previously excavated and impacted material was transported off site as described in the Form 19.

## **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.

Enhanced fluid recovery (EFR) and air sparge (AS) activities were conducted between the third quarter 2013 and fourth quarter 2017. Monitored natural attenuation (MNA) was selected as the remediation strategy for the first quarter 2018 and will remain the selected remediation strategy as an interim measure. Supplemental drilling and site assessment activities were conducted between January 22 and January 30, 2020. Twenty-two monitoring wells (BH25 – BH46) were installed on and off-site to delineate the extent of remaining hydrocarbon impacts in soil and groundwater. PDC is currently awaiting approval from a secondary landowner to the north to proceed with additional drilling and assessment activities. A remedial strategy to address remaining impacts will be determined upon the completion of off-site investigation activities and evaluation of all soil and groundwater data.

## **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
- 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.

First quarter 2020 groundwater monitoring was conducted on January 8, 2020, at the 22 site monitoring wells (BH01R, BH02 – BH05, BH06R, and BH09 – BH24). In addition, partial groundwater sampling was conducted during the supplemental investigation to determine the extent of monitoring wells required to establish point of compliance. Based on the initial groundwater data, additional drilling and assessment are required to delineate the extent of groundwater impacts off-site. Groundwater monitoring will be initiated at all 46 monitoring wells (BH01R, BH02 – BH05, BH06R, and BH09 – BH46) during the second quarter monitoring event scheduled for April 2020.

# 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? 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? No

Do all soils meet Table 910-1 standards? \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? \_\_\_\_\_

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? \_\_\_\_\_

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

## 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 facility was decommissioned in January 2016. Following the completion of remedial activities, the location will be reclaimed in accordance with COGCC 1000 Series Rules.

Is the described reclamation complete? No

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). \_\_\_\_\_

Date of commencement of Site Investigation. 06/20/2013

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

## **REMEDIAL ACTION DATES**

Date of commencement of Remediation. 08/06/2013

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

## **SITE RECLAMATION DATES**

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

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

## **OPERATOR COMMENT**

PDC is currently awaiting approval from a secondary landowner to the north to proceed with additional off-site drilling and assessment activities.

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: \_\_\_\_\_

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: \_\_\_\_\_

Date: \_\_\_\_\_

Remediation Project Number: 7945

## **COA Type**

## **Description**

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## **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**

402341765	ANALYTICAL RESULTS
402341818	GROUND WATER SAMPLE LOCATION

Total Attach: 2 Files

## **General Comments**

### **User Group**

### **Comment**

### **Comment Date**

Environmental	COGCC returned the form to draft on 3/9/2020 for insufficient data.	03/09/2020
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Total: 1 comment(s)