

State of Colorado  
Oil and Gas Conservation Commission

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Report taken by:  
PETER GINTAUTAS

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: 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 #: 9077 Initial Form 27 Document #: 2143216

**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 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: SPILL OR RELEASE	Facility ID: 440335	API #: _____	County Name: WELD
Facility Name: SPILL/RELEASE POINT	Latitude: 40.323817	Longitude: -104.860179	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NESW	Sec: 11	Twp: 4N	Range: 67W Meridian: 6 Sensitive Area? Yes

**SITE CONDITIONS**

General soil type - USCS Classifications CL      Most Sensitive Adjacent Land Use Irrigated cropland

Is domestic water well within 1/4 mile? Yes      Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? Yes

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

10 domestic water wells and 2 irrigation wells located within 0.25 miles.

# 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 checked="" type="checkbox"/> Oil            | <input type="checkbox"/> Tank Bottoms                |  |
| <input checked="" 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	14,400 square feet	Site assessment groundwater samples
	SOILS	80' N-S x 50' E-W x 13' bgs	Site assessment soil samples

## INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

All production equipment was shut in. Please refer to Form 19 submitted December 11, 2014 (Document #400743328).

## 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 ):

Four soil samples were collected from the sidewalls of the excavation and analyzed for BTEX and TPH. An additional 17 soil borings were advanced throughout the site to assess the potential extent of petroleum hydrocarbon impact. One sample from each soil boring was collected from the interval exhibiting the greatest potential for petroleum hydrocarbon impacts (i.e., high PID readings, staining, odor). All soil boring samples were analyzed for BTEX and TPH.

### Proposed Groundwater Sampling

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

The 17 soil borings advanced at the site were completed as groundwater monitoring wells at depths ranging from 20 feet to 25 feet below ground surface (bgs). All monitoring wells were developed and sampled for BTEX.

### 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 21  
Number of soil samples exceeding 910-1 3  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 4000

### NA / ND

-- Highest concentration of TPH (mg/kg) 16131  
NA Highest concentration of SAR           
BTEX > 910-1 Yes  
Vertical Extent > 910-1 (in feet) 12

### Groundwater

Number of groundwater samples collected 17  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 12'  
Number of groundwater monitoring wells installed 17  
Number of groundwater samples exceeding 910-1 2

-- Highest concentration of Benzene (µg/l) 6870  
ND Highest concentration of Toluene (µg/l)           
-- Highest concentration of Ethylbenzene (µg/l) 246  
-- Highest concentration of Xylene (µg/l) 592  
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?

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?

The analytical results of three of the four soil samples collected from the excavation sidewalls reported concentrations that exceeded COGCC Table 910-1 standards. Confirmation soil samples will be collected from these areas after in-situ remediation has occurred.

# 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.

Approximately 400 cubic yards of impacted soil was excavated, and approximately 3,000 barrels of groundwater were removed from the open excavation. Please refer to the LTE Remediation Activity Summary, Brownwood 11-1, 11-2, dated March 18, 2015, for additional details.

## 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 total of 300 pounds of a carbon-based amendment (BOS 200) was applied to the floor of the excavation prior to backfilling. The impacted soil was transported to Waste Management North Weld Landfill, for final disposal. The impacted groundwater was disposed of at a licensed facility. An infiltration gallery was installed at the floor of the excavation prior to backfilling for potential future remediation efforts. The extent of impact was delineated by advancing 17 boreholes, completed as groundwater monitoring wells. Confirmation soil samples were collected from the boreholes and analyzed for BTEX and TPH. Groundwater samples were collected from the groundwater monitoring wells and analyzed for BTEX. Please refer to the LTE Remediation Activity Summary, dated March 18, 2015, for additional details.

## Soil Remediation Summary

In Situ

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

Ex Situ

Yes Excavate and offsite disposal  
\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) 400  
Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_  
No Excavate and onsite remediation  
\_\_\_\_\_ Land Treatment  
\_\_\_\_\_ Bioremediation (or enhanced bioremediation)  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Other \_\_\_\_\_

## Groundwater Remediation Summary

Yes 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 encountered in the excavation at approximately 13 feet bgs. Seventeen groundwater monitoring wells were advanced to delineate the extent of impacts to soils and groundwater. The monitoring wells were advanced to depths ranging from 20 feet to 25 feet bgs. Groundwater samples were collected from the monitoring wells and submitted for analysis of BTEX. Groundwater samples will be collected from the monitoring wells on a quarterly basis until concentrations are in compliance with COGCC Table 910-1 standards for four consecutive quarters under static conditions. Due to a documented reduction in the dissolved-phase petroleum hydrocarbon plume, an established groundwater gradient, and landowner preference, Synergy respectfully requests that the COGCC consider approval of a reduction in the number of monitoring wells included in the monitoring program. The landowner is pressuring Synergy to reduce the footprint on his farmland, and only two of the monitoring wells remain impacted. Synergy proposes that the quarterly monitoring program be reduced to three monitoring wells: the two impacted wells (MW02 and MW06), and a downgradient well (MW09) to serve as the point of compliance.

# 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? \_\_\_\_\_

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.

The excavation was backfilled with clean fill to re-establish the pre-existing grade. The site is in an active agricultural field. Upon remediation completion, the site will be reclaimed per Rule 1004.

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? Yes \_\_\_\_\_

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

## IMPLEMENTATION SCHEDULE

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. 12/01/2014

Actual Spill or Release date, if known. 12/01/2014

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/01/2014

Date of commencement of Site Investigation. 12/01/2014

Date of completion of Site Investigation. 03/03/2015

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 12/02/2014

Date of completion of Remediation. 12/27/2017

### SITE RECLAMATION DATES

Date of commencement of Reclamation. 12/27/2017

Date of completion of Reclamation. 12/27/2017

### OPERATOR COMMENT

Per COGCC request, submitting 3Q-17 and 4Q-17 groundwater monitoring reports, providing notification that the groundwater monitoring wells were P&A'd 12/27/17 and requesting a no further action approval for remediation project.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Karen Olson

Title: Snr. Program Manager

Submit Date: 06/23/2020

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: PETER GINTAUTAS

Date: 06/23/2020

Remediation Project Number: 9077

### COA Type

### Description

	Based on the information presented, it is concluded 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 ground water is found to be impacted, then further investigation and/or further remediation activities may be required. In addition, the surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.
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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

402428648	FORM 27-SUPPLEMENTAL-SUBMITTED
402428667	MONITORING REPORT
402428671	MONITORING REPORT

Total Attach: 3 Files

### General Comments

#### User Group

#### Comment

#### Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)