

State of Colorado
Oil and Gas Conservation Commission

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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.

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>	Phone Numbers Phone: <u>(303) 860-5800</u> Mobile: <u>()</u>
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>		

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 10763 Initial Form 27 Document #: 401440234

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>331521</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>FOE-66N64W 20NWSE</u>	Latitude: <u>40.469140</u>	Longitude: <u>-104.571440</u>	
	** correct Lat/Long if needed: Latitude: <u>40.468490</u>	Longitude: <u>-104.564910</u>	
QtrQtr: <u>NWSE</u>	Sec: <u>20</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

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

FWS Wetlands are located approximately 718 feet south of the location. Occupied buildings are located approximately 115 feet south the location. There are no CPW Sensitive Wildlife Habitats identified within a 1/4-mile radius.

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 Figure 2.	Excavation and sampling 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 October 13, 2016, approximately 14 barrels of produced water were released within secondary containment at the Foe 33-20 tank battery. Upon discovery, the produced water dump line was shut in and spill response measures were completed. An Initial Form 19 was submitted to the COGCC on November 4, 2017, (Doc# 401142968) and was issued Spill/Release Point ID 448350.

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):

On November 14, 2016 and February 2, 2017, site investigation activities were conducted to determine the extent of potential hydrocarbon impacts related to the release. Six soil borings (SB01 – SB06) were advanced to approximately 6 feet below ground surface (bgs). Grab soil samples were collected from the borings in 1-foot intervals and field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). Soil samples were collected from the terminus of each soil boring at approximately 6 feet bgs. Samples were submitted to Summit Scientific Laboratories in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260B, and TPH - diesel range organics (DRO) by USEPA Method 8015. Analytical results indicated that constituent concentrations were below COGCC Table 910-1 standards in all six soil 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):

A summary of sub-surface investigation activities and analytical results was provided in a Form 27 submitted to the COGCC on February 28, 2017, under Remediation #10072. Soil boring locations are illustrated in Figure 2 and soil analytical results are summarized in Table 1. The laboratory reports are included in Attachment A.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 6
Number of soil samples exceeding 915-1 0
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 2668

NA / ND

ND Highest concentration of TPH (mg/kg) _____
NA Highest concentration of SAR _____
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 6

Groundwater

Number of groundwater samples collected 1
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 0'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 915-1 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 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?

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 COGCC issued a condition of approval (COA) requiring that upon the completion of vessel repair activities, additional confirmation sampling below the vessel must be completed.

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 August 30 and September 7, 2017, approximately 1,360 cubic yards of impacted material were removed and transported to the North Weld Waste Management Facility in Ault, Colorado for disposal under PDC waste manifests. Nine (9) soil samples (SS01 - SS09) were collected from the sidewalls of the final extent of the excavation at depths ranging between 12.5 and 13 feet below ground surface (bgs). Samples were submitted to Summit Scientific Laboratories (Summit) in Golden, Colorado for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260B, and TPH - diesel range organics (DRO) by USEPA Method 8015. Analytical results indicated that TPH concentrations were in exceedance of applicable COGCC Table 910-1 standards in soil sample SS07. The remaining soil samples exhibited constituent concentrations below applicable regulatory standards. Groundwater was encountered within the excavation at approximately 14.5 feet bgs. Following the completion of excavation activities, approximately 134 barrels of groundwater removed via vacuum trucks and transported to a licensed disposal facility. On September 22, 2017, one groundwater sample (GW01) was collected from the excavation and submitted for laboratory analysis of BTEX by USEPA Method 8260B. Analytical results indicated that BTEX concentrations were below the applicable COGCC Table 910-1 groundwater standards. The final excavation extent and sample locations are illustrated on Figure 3. Soil and groundwater analytical data is summarized in Table 1 and Table 2, respectively.

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.

Based on the analytical results, petroleum hydrocarbon impacted material remains within the unsaturated interval along the southern extent of the former 2017 excavation area. Impacted material could not be removed during excavation activities due to third-party buried infrastructure.

Supplemental source mass removal activities will be conducted by the end of the third quarter 2021 to remove remaining hydrocarbon impacts along the third-party infrastructure. Per COGCC correspondence, confirmation soil samples will be collected from the base and sidewalls of the final excavation extent and submitted to Summit Scientific for analysis of the COGCC Table 915-1 Organic Compounds in Soils and TPH (C6-C36). Excavation activities and final analytical results will be summarized in a forthcoming Supplemental Form 27 within 90 days of the completing the proposed remediation workplan.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 1360

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC Facility ID # _____

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ Land Treatment

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Other _____

Groundwater Remediation Summary

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ 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.

During second quarter 2021 groundwater monitoring activities, monitoring well BH01 could not be located and presumed to be destroyed during third party decommissioning activities. Per COGCC correspondence, should analytical results collected during supplemental source mass removal activities indicate that organic compound concentrations are below the applicable COGCC Table 915-1 Protection of Groundwater SSLs, then no additional groundwater monitoring will be conducted at this location.

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 Supplemental Source Mass Removal Plan

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

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.

The excavation was backfilled and re-contoured to match pre-existing conditions. The produced water vessel and associated production infrastructure were decommissioned following excavation activities.

Is the described reclamation complete? _____

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. _____

Proposed date of completion of Reclamation. _____

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. 11/04/2016

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/13/2016

Proposed site investigation commencement. 11/14/2016

Proposed completion of site investigation. 09/27/2021

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/30/2017

Proposed date of completion of Remediation. _____

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

Per COGCC correspondence, supplemental source mass removal activities will be conducted at the former Foe 33-20 tank battery location by the end of the third quarter 2021.

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: 07/22/2021

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: 08/12/2021

Remediation Project Number: 10763

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

<u>COA Type</u>	<u>Description</u>
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**

402755395	FORM 27-SUPPLEMENTAL-SUBMITTED
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Total Attach: 1 Files

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

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

Total: 0 comment(s)