

State of Colorado Oil and Gas Conservation Commission

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Document Number:

402987422

Receive Date:

03/28/2022

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
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 #: 6942 Initial Form 27 Document #: 2223871

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>323620</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>NOFFSINGER-65N64W 5SENW</u>		Latitude: <u>40.430030</u>	Longitude: <u>-104.576470</u>
		** correct Lat/Long if needed: Latitude: <u>40.428360</u>	Longitude: <u>-104.574290</u>
QtrQtr: <u>SENW</u>	Sec: <u>5</u>	Twp: <u>5N</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 CULTIVATED

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

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

SURFACE WATER AREA ~1,100' S, AGRICULTURAL WATER WELL 20' E, BUILDINGS ~900' SE, DEPTH TO GROUNDWATER 43' BGS.

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 Table 1	Excavation, drilling, and 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 2011, Operator discovered a historical dump line release at the Noffsinger 1 tank battery location. Approximately 100 cubic yards of soils were excavated and transported off site under waste manifests. COGCC issued Spill ID: 2223047 to the project.

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):

Groundwater monitoring will continue on a quarterly basis at the 6 site monitoring wells (MW-1 - MW-6). Groundwater samples will be submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260B on a quarterly basis until closure criteria is achieved. Additionally per document # 402605613 approved February 24, 2021, four quarters of sampling for inorganic parameters, chlorides and sulfates by method SM 2450C, and total dissolved solids (TDS) by EPA Method 300.0 in accordance with Table 915-1 will be conducted.

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 6

Number of soil samples exceeding 915-1 3

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 1600

Groundwater

Number of groundwater samples collected 2

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 44'

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 915-1 2

Surface Water

0 Number of surface water samples collected

Number of surface water samples exceeding 915-1

If surface water is impacted, other agency notification may be required.

NA / ND

-- Highest concentration of TPH (mg/kg) 2110

NA Highest concentration of SAR

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 43

-- Highest concentration of Benzene (µg/l) 2200

-- Highest concentration of Toluene (µg/l) 2600

-- Highest concentration of Ethylbenzene (µg/l) 190

-- Highest concentration of Xylene (µg/l) 2000

NA Highest concentration of Methane (mg/l)

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.

The source area was excavated and impacted material was transported and disposed off site. Activities described in Form 19 submittal.

REMEDIAL ACTION 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.

Between October 2013 and December 2015, a solar powered soil vapor extraction (SVE) fan was operational at BH01 to address remaining petroleum hydrocarbon impacts in soil. In April 2016, a full-scale SVE remediation system was installed. SVE will continue as the selected remediation strategy for the second quarter 2022.

Due to persistent impacts at MW-2 PDC has scheduled supplemental remediation activities to enhance ongoing soil vapor extraction targeting the vicinity of MW-2 and to collect soil samples to confirm current extent of remaining soil impacts. Initially, two (2) soil borings will be advanced via hollow stem auger drilling methods, soil samples will be collected from each soil boring at the interval exhibiting the highest volatile organic compound (VOC) reading utilizing a photoionization detector (PID) reading and at the terminus of each soil boring. Samples will be submitted for laboratory analysis Table 915-1 Organic Compounds in Soil, TPH (C6-C36). Following soil boring and sampling activities to evaluate the progress of the soil remediation, supplemental remedial activities (biodegradable soap and granular activated carbon) injections targeted around MW-2 will be conducted.

Per access approvals, on March 24, 2022, in four locations, (existing SVE wells BH05 & BH10 as well as two direct push injection points, IP1 and IP2) injection of 600 gallons of a 2% biodegradable surfactant (150 gallons in each point) was conducted. On April 11, 2022, it is scheduled to conduct the second part of the regimen consisting of injecting up to approximately 1,260 pounds of a 12% GOGAC solution COGAC (granular activated carbon) in the same four points as the surfactant. The injection points are identified on the attached map.

Soil Remediation Summary

☒ In Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

Yes _____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

☒ Ex Situ

Yes _____ Excavate and offsite disposal

_____ If Yes: Estimated Volume (Cubic Yards) _____ 100

_____ 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

Yes _____ 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.

On April 12, 2018, three groundwater monitoring wells (MW-1 through MW-3) were installed and quarterly groundwater sampling was initiated. On January 31, 2019, three additional monitoring wells (MW-4 through MW-6) were installed to establish point of compliance. Groundwater monitoring will continue at the six monitoring wells on a quarterly basis. Groundwater results will be reported quarterly.

Per the revised 900 series rules effective January 15, 2021, beginning in the 1Q21 groundwater samples will be submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260B in accordance with Table 915-1. In addition, per COA in document # 402605613 approved February 24, 2021, sampling for inorganic parameters, including total dissolved solids (TDS), chloride, and sulfate, will be conducted for four quarters at the source, up-and down-gradient monitoring wells. Quarterly groundwater sampling will continue until closure criteria is achieved.

REMEDATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

☐ Quarterly☐ Semi-Annually☐ Annually☒ Other

1/4 groundwater monitoring and remedial system progress report

☐ 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 1/4 GW monitoring remedial system progress report

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: _____

REMEDATION COMPLETION REPORT

REMEDATION 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 tank battery was decommissioned and will not be reconstructed. The area will be reclaimed in accordance with COGCC Rule 1004.

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 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. 04/29/2021

Actual Spill or Release date, or date of discovery. 11/23/2011

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). _____

Proposed site investigation commencement. 11/23/2011

Proposed completion of site investigation. _____

REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/23/2011

Proposed date of completion of Remediation. 12/31/2026

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

This Supplemental Form 27 was submitted to summarize the quarterly groundwater monitoring, remediation activities and analytical results collected during the 1Q22 at the former Noffsinger 1 location. Sampling for total dissolved solids (TDS), chloride, and sulfate, will be conducted for four consecutive quarters per COA in document # 402605613 approved February 24, 2021. The 1Q22 represents the third quarter inorganic sampling was completed. No inorganic exceedances were identified.

Per COGCC request of March 28, 2022, a copy of the approved UIC authorization, as well as copies of the SDS for the surfactant and COGAC have been attached. The surfactant injection activities have been completed. COGAC injection activities are scheduled to be conducted on April 11, 2022.

A summary of the confirmation soil sampling results to evaluate the effectiveness of the SVE system, the supplemental remedial activities, quarterly groundwater monitoring and ongoing SVE activities will be provided in next SF27 submittal.

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: 03/28/2022

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: 03/29/2022

Remediation Project Number: 6942

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

	Operator will continue monitoring Table 915-1 Inorganic Groundwater Parameters for a minimum of four quarters post-COGAC injection.
	On the next monitoring report the Operator will propose a schedule reasonable with surface owner land use for installing additional monitoring wells to characterize the hydrocarbon groundwater plume between MW-2 and BH06 and between MW-1 and MW-4.
2 COAs	

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**

402987422	FORM 27-SUPPLEMENTAL-SUBMITTED
402987438	MONITORING REPORT
402996513	UIC PERMIT
402996515	SAFETY DATA SHEETS
402997003	MAP

Total Attach: 5 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)