

State of Colorado Oil and Gas Conservation Commission

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Report taken by:

Candice (Nikki) Graber

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: <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 #: 13978Initial Form 27 Document #: 402143603

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: <u>SPILL OR RELEASE</u>	Facility ID: <u>466613</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Warren McMillan 2 Historic Spill</u>		Latitude: <u>40.293236</u>	Longitude: <u>-104.711610</u>
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: <u>SWSW</u>	Sec: <u>19</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 SMMost Sensitive Adjacent Land Use cropIs domestic water well within 1/4 mile? YesIs surface water within 1/4 mile? NoIs groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

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	GROUNDWATER	TBD	sampling
Yes	SOILS	160'x70	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.

During production facility demo and equipment removal, Unlimited Service's roustabout crew observed potential contamination near the separator dump line riser. The soil of concern was sampled and analyzed for BTEX, DRO, and GRO. Results were not within Table 910-1 limits. SRC and Unlimited are in the process of impacted soil extent determination and removal. Groundwater was encountered at approximately 8.5' below ground surface. A groundwater sample was collected and analyzed for BTEX. Those results were also not Table 910-1 compliant.

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):

During impacted soil removal operations, several sidewall soil samples were collected at depth around the perimeter of the excavation and analyzed for BTEX/DRO/GRO at Origins Laboratory in Denver. Impacted soil excavation figure, lab analytical reports, and data tables are submitted with this document.

Proposed Groundwater Sampling

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

The initial array of 9 MWs on the proposed MW figure submitted with this document will be installed by Eagle Environmental. The MWs will be developed, sampled, and analyzed for BTEX at Origins Laboratory in Denver.

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):

If the extents of impacted groundwater are not defined with the initial 9 proposed MWs, SRC and Eagle will go ahead and move forward with installing additional MWs until groundwater impact extent is fully defined.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 22
Number of soil samples exceeding 910-1 5
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 11200

NA / ND

-- Highest concentration of TPH (mg/kg) 1277
NA Highest concentration of SAR
BTEX > 910-1 Yes
Vertical Extent > 910-1 (in feet) 9

Groundwater

Number of groundwater samples collected 1
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 9'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 107
-- Highest concentration of Toluene (µg/l) 11.1
-- Highest concentration of Ethylbenzene (µg/l) 180
-- Highest concentration of Xylene (µg/l) 667
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) 1540 Volume of liquid waste (barrels) 1170

☒ Is further site investigation required?

impacted groundwater extent determination

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.

Well has been plugged and equipment removed.

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.

SRC and Unlimited removed approximately 1,540 yds of impacted soil and 1,170 bbls of impacted groundwater from the excavation. Clean dirt in the top 4 or so feet of the excavation was removed and stockpiled separately for backfill material, so that the impacted soil at depth could be reached and removed. Once perimeter sidewall soil samples confirmed all impacted material above the saturated zone had been removed, 500 lbs of carbon and 300 lbs of gypsum were applied to the excavation before backfill.

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) _____ 1540

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)

Yes _____ Chemical oxidation

☐ _____ Air sparge / Soil vapor extraction

☐ _____ Natural Attenuation

Yes _____ Other _____ removal

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.

The initial array of 9 MWs on the proposed MW figure submitted with this document will be installed by Eagle Environmental. The MWs will be developed, sampled, and analyzed for BTEX at Origins Laboratory in Denver. If the extents of impacted groundwater are not defined with the initial 9 proposed MWs, SRC and Eagle will go ahead and move forward with installing additional MWs until groundwater impact extent is fully defined. Once POC is defined, MWs will be sampled quarterly until 4 consecutive quarters of Table 910-1 compliant results has been achieved.

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:

none

Volume of E&P Waste (solid) in cubic yards 1540

E&P waste (solid) description impacted soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Landfill

Volume of E&P Waste (liquid) in barrels 1170

E&P waste (liquid) description impacted groundwater mixed with
irrigation pivot water

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: CSI Bennett

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? No

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? No

Does Groundwater meet Table 910-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

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.

Site is to be reclaimed per 1000 series rules pending landowner consultation at the site. However, seeding won't take place until all necessary MWs have been installed to define POC.

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? 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. _____

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. 07/30/2019 _____

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

This SF27 is to report 2020Q1 groundwater monitoring results, and provide a map for the two addition proposed POC wells MW-10 and MW-11. Eagle's 2020Q1 groundwater monitoring report is attached. The two additional wells will be installed, sampled and incorporated in the 2020Q2 monitoring network report.

Confirmation soil sampling near MW-3 will be conducted after four consecutive quarters of groundwater results exhibit concentrations below table 910-1 standards.

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: ` 04/02/2020

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: 04/03/2020

Remediation Project Number: 13978

COA Type**Description**

	In accordance with Rule 910.b(4) additional monitoring wells are required to define the horizontal extent of impacts to groundwater. More than one well may be required to obtain point of compliance. The monitoring well(s) shall be installed within 45 days. Operator shall field log soil borings during monitoring well installation and provide boring logs/well construction diagrams with the next monitoring report.
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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**

402357843	FORM 27-SUPPLEMENTAL-SUBMITTED
402357859	MONITORING REPORT

Total Attach: 2 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)