

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

Report taken by:

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>Karen.Olson@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 7952Initial Form 27 Document #: 2145965

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 type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation | <input checked="" 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>331008</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>JACOBUCCI-61N67W 32NWSW</u>		Latitude: <u>40.006398</u>	Longitude: <u>-104.922133</u>
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>32</u>	Twp: <u>1N</u>	Range: <u>67W</u>
Meridian: <u>6</u>		Sensitive Area? <u>Yes</u>	

SITE CONDITIONS

General soil type - USCS Classifications SMMost Sensitive Adjacent Land Use CROP LANDIs domestic water well within 1/4 mile? YesIs surface water within 1/4 mile? YesIs groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Livestock pasture is located east of the tank battery location. Surface water is located approximately 680 feet west of the tank battery location. The nearest water well and occupied building are located approximately 790 feet and 1,250 feet southwest of the tank battery location, respectively.

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
	GROUNDWATER	REFER TO FIGURE 3 AND TABLE 2	GROUNDWATER SAMPLING
	SOILS	REFER TO FIGURE 2 AND TABLE 1	EXCAVATION, DRILLING, 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.

On February 11, 2013, historic hydrocarbon impacts were discovered while replacing the dump lines at the Jacobucci 13-32, 23-32 tank battery. Between February 11 and March 5, 2013, approximately 2,290 cubic yards were removed and transported to the North Weld Waste Management Facility in Ault, Colorado for disposal under PDC waste manifests. A Form 19 was submitted to the COGCC on March 25, 2013, and Spill Tacking No. 2232473 was assigned to the release.

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 0
Number of soil samples exceeding 910-1
Was the areal and vertical extent of soil contamination delineated?
Approximate areal extent (square feet)

NA / ND

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

Groundwater

Number of groundwater samples collected 8
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 5'
Number of groundwater monitoring wells installed 8
Number of groundwater samples exceeding 910-1 0

-- Highest concentration of Benzene (µg/l) 2.4
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
 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?

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 February 11 and March 5, 2013, approximately 2,290 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.

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.

As summarized in the attached Form 27 Supplemental Report and Request for No Further Action (NFA), enhanced fluid recovery (EFR) and air sparge (AS) activities were conducted on site between the second quarter 2013 and fourth quarter 2015 to address the remaining dissolved-phase petroleum hydrocarbon impacts on site. Monitored natural attenuation (MNA) was initiated as the selected remediation strategy during the first quarter 2016 and continued through the fourth quarter 2017. During the fourth quarter 2017, four quarters of post-remediation BTEX concentrations in compliance with COGCC Table 910-1 standards were achieved.

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) 2290
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
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.

Groundwater monitoring was initiated at the site monitoring well network during the second quarter 2013. Groundwater samples were collected on a quarterly basis and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8260B. During the fourth quarter 2017, four quarters of post-remediation BTEX concentrations in compliance with COGCC Table 910-1 standards were achieved.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Form 27 Supplemental Report and No Further Action (NFA) Request

Report Type: ☒ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report
☒ Other Form 27 Supplemental Report and No Further Action (NFA) Request

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? 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 area was backfilled, compacted, and re-graded to match pre-existing conditions. The production facility was reconstructed and is currently in operation.

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?

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). 02/11/2013

Date of commencement of Site Investigation. 02/11/2013

Date of completion of Site Investigation. 03/05/2013

REMEDIAL ACTION DATES

Date of commencement of Remediation. 04/08/2013

Date of completion of Remediation. 10/02/2017

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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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 EHS Manager

Submit Date: _____

Email: Karen.Olson@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: 7952

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

401424607	REMEDIATION PROGRESS REPORT
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Total Attach: 1 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)