

State of Colorado
Oil and Gas Conservation Commission

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401416967
Receive Date:
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Report taken by:
RICK ALLISON

Site Investigation and Remediation Workplan (Initial 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 INFORMATON

| | | |
|--|------------------------------------|------------------------------|
| 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> | | Mobile: <u>()</u> |
| Contact Person: <u>Karen Olson</u> | Email: <u>karen.olson@pdce.com</u> | |

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 10573 Initial Form 27 Document #: 401416967

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 checked="" 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 Facilites (in accordance with Rule 909.c.)

| | | | |
|---|---|-------------------------------|---|
| Facility Type: <u>LOCATION</u> | Facility ID: <u>327209</u> | API #: _____ | County Name: <u>WELD</u> |
| Facility Name: <u>STATE LEASE-66N63W 28SWSW</u> | Latitude: <u>40.452060</u> | Longitude: <u>-104.448920</u> | |
| | ** correct Lat/Long if needed: Latitude: <u>40.451587</u> | Longitude: <u>-104.449137</u> | |
| QtrQtr: <u>SWSW</u> | Sec: <u>28</u> | Twp: <u>6N</u> | Range: <u>63W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u> |

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Rangeland
 Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? No
 Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

A water well is located 2,760 feet from the site. The nearest occupied building is located 4,195 feet from the site. There is no surface water located within 1 mile of the site.

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 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 |
|-----------|----------------|-------------------------------------|--------------------|
| Yes | SOILS | Vertical defined; Lateral undefined | Refer to Figure 1. |

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 September 8, 2017, historic petroleum hydrocarbon impacts were discovered below the produced water vessel during plug and abandonment activities at the State 6524 13, 14, 23, 24-28 tank battery. Excavation activities were subsequently initiated below the former production tanks. Between September 8 and September 22, 2017, approximately 2,680 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. An initial soil sample (SS01) was collected from the base of the excavation at 21 feet below ground surface (bgs) and submitted to Summit Scientific Laboratories (Summit) for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH) – gasoline range organics (GRO) by United States Environmental Protection Agency (USEPA) Method 8260, and TPH – diesel range organics (DRO) by USEPA Method 8015. Analytical results indicated TPH concentrations were in exceedance of COGCC Table 910-1 soil standards. Consequently, a test pit was advanced within the base of the excavation area to determine the vertical extent of remaining petroleum hydrocarbon impacts. A soil sample (SS02) was collected at 31 feet bgs and submitted for laboratory analysis of BTEX, naphthalene, TPH – GRO by USEPA Method 8260, and TPH – DRO by USEPA Method 8015. Analytical results indicated constituent concentrations were below COGCC Table 910-1 soil standards. The excavation extent and soil sample locations are illustrated on Figure 1. Soil analytical data is summarized in Table 1 and laboratory reports are provided in Attachment A.

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):

The lateral extent of remaining petroleum hydrocarbon impacts in soil has not been defined. Investigation and delineation activities will be conducted concurrently with the proposed remediation plan.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 2

Number of soil samples exceeding 910-1 1

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

Approximate areal extent (square feet) 1300

NA / ND

-- Highest concentration of TPH (mg/kg) 7400

NA Highest concentration of SAR

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 31

Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet)

Number of groundwater monitoring wells installed

Number of groundwater samples exceeding 910-1

Highest concentration of Benzene (µg/l)

Highest concentration of Toluene (µg/l)

Highest concentration of Ethylbenzene (µg/l)

Highest concentration of Xylene (µg/l)

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

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Between September 8 and September 22, 2017, approximately 2,680 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. Remaining impacted material will be treated on-site using ex-situ chemical oxidation.

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.

Excavation and ex-situ chemical oxidation will be conducted to address remaining petroleum hydrocarbon impacts in soil. Confirmation soil samples will be collected for every 100 cubic yards of soil treated with hydrogen peroxide to confirm hydrocarbon concentrations were reduced below COGCC Table 910-1 soil standards and material could be used for backfilling. Soil samples will be collected from the final excavation extent prior to backfilling. A summary of remediation and sampling activities will be provided in a supplemental report.

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)
Name of Licensed Disposal Facility or COGCC Facility ID # _____
- Yes Excavate and onsite remediation
- No Land Treatment
- No Bioremediation (or enhanced bioremediation)
- Yes Chemical oxidation
- No Other _____

Groundwater Remediation Summary

- 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 not encountered during excavation activities.

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:

No beneficial use to date.

Volume of E&P Waste (solid) in cubic yards 2680

E&P waste (solid) description Petroleum hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Waste Management

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

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 will be backfilled and re-graded to match pre-existing conditions. The tank battery will not be reconstructed.

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? _____

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). 09/08/2017

Date of commencement of Site Investigation. 09/08/2017

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 10/16/2017

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

| |
|--|
| |
|--|

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: ` 10/04/2017 _____

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: RICK ALLISON _____

Date: 10/10/2017 _____

Remediation Project Number: 10573 _____

COA Type**Description**

| | |
|--|--|
| | |
|--|--|

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**

| | |
|-----------|---------------------------|
| 401416967 | FORM 27-INITIAL-SUBMITTED |
| 401417004 | SITE MAP |
| 401417019 | ANALYTICAL RESULTS |

Total Attach: 3 Files

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

| | | |
|--|--|---------------------|
| | | Stamp Upon Approval |
|--|--|---------------------|

Total: 0 comment(s)