

State of Colorado
Energy & Carbon Management Commission

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403565462
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Report taken by:
Taylor Robinson

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.

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>(970) 313-5582</u> Mobile: <u>()</u>
Address: <u>1099 18TH STREET SUITE 1500</u>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80202</u>
Contact Person: <u>Jason Davidson</u>	Email: <u>FRspillremediationcontractor@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 32427 Initial Form 27 Document #: 403565462

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>SPILL OR RELEASE</u>	Facility ID: <u>484756</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Stugart Sec. 20</u>	Latitude: <u>40.386460</u>	Longitude: <u>-104.805787</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NENW</u>	Sec: <u>20</u>	Twps: <u>5n</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Cropland
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? Yes

Other Potential Receptors within 1/4 mile

The Stugart Sec. 20 tank battery is surrounded by agricultural fields to the north, south, and west, and vacant land to the east and northeast. There are 2 unnamed drainages 375' and 815' to the north of the Site. The Loveland Greeley Ditch, Ashcroft Draw, and a spring are in place 615' east of the Site. There is one residential property 1,285' northeast of the Site. There are no domestic groundwater well permits mapped within a quarter mile of the Site. Nearby groundwater wells indicate static water levels less than 20 ft-bgs. An Aquatic Native Species Conservation Waters buffer is mapped 300' east of the Site. A freshwater emergent wetland is mapped approximately 1,165' east of the Site. There are no additional sensitive areas, wetlands, or wildlife habitats identified within a quarter mile of the Site.

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	20' x 20' x 0.5' deep	Confirmation 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.

A release occurred on 5/28/23, when a pressure relief valve released approximately two barrels of production fluid to the pad surface. Cleanup commenced immediately following the release using hydrovac equipment. Soil impacts were limited to the road base surface to approximately 0.5 feet below pad surface.

On 6/1/23 and 6/2/23, thirty-eight confirmation soil samples were collected during a site investigation undertaken to define the magnitude and extent of the residual impacts resulting from the release. Based on photoionization detector (PID) values >10 parts per million (ppm), 13 of the 38 samples collected at a depth of 0.5 feet bgs were submitted for analysis of the full Table 915-1 suite of analytes by ECMC approved methods. Refer to the attached Tables 1 - 4 and to Figures 3 and 4.

Due to drilling equipment covering the release area, excavation was completed on 8/4/23. Approximately seven cubic yards of impacted soil were removed by Mundt Oilfield Services during the excavation. The impacted soil was disposed of at Waste Management's North Weld Landfill in Ault, Colorado as non-hazardous waste.

Five confirmation soil samples were collected from the release area at a depth 0.5 feet below pad surface during the single-day excavation and field screened using a PID. The soil samples were combined and submitted as one composite sample analyzed by Summit Scientific Inc. (Summit) in Golden, Colorado for the full ECMC Table 915-1 suite of analytes by ECMC approved methods.

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):

Refer to the Initial Actions Summary above.

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 14
Number of soil samples exceeding 915-1 14
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 400

NA / ND

-- Highest concentration of TPH (mg/kg) 200
-- Highest concentration of SAR 3.48
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 1

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 915-1 _____

____ 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 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?

On 6/1/23, five background samples were collected on the raised well pad from similar depths as the excavation in undisturbed areas away from oil and gas activity. The samples are representative of the pad's lithology, consisting of road base and imported fill used to level the pad's surface during construction 1 foot to 2 feet above the preexisting grade. The samples were analyzed for Table 915-1 Soil Suitability for Reclamation parameters and Metals in Soils by ECOM approved methods. Arsenic concentrations in all 5 background samples were reported above the Table 915-1 Residential Soil Screening Level (RSSL). Barium concentrations in two of the 5 background samples were reported above the Table 915-1 Protection of Groundwater Soil Screening Level (PGWSSL). Refer to the attached Tables 3 and 4 and to Figure 5.

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?

Refer to the Operator Comments section of this Form 27.

REMEDIAL ACTION PLAN

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Following initial clean-up activities, approximately seven cubic yards of impacted soil were removed from the release area at the Stugart well pad location by excavation. The impacted soil was disposed of at Waste Management's North Weld Landfill in Ault, Colorado as non-hazardous waste in accordance with Rules 905 and 906. Copies of the waste manifests are available upon request.

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 of impacted soil was undertaken to remove impacts to 0.5 feet bgs. Confirmation soil samples were collected and analyzed for the full Table 915-1 suite of analytes by ECOM approved methods. Refer to the Source Removal Summary above for further discussion.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Air sparge / Soil vapor extraction
_____ Natural Attenuation
_____ Other _____

Yes _____ Excavate and offsite disposal
If Yes: Estimated Volume (Cubic Yards) _____ 7
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
_____ 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 site investigation or remediation activities at the Site.

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 Remediation Progress Report

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Operator does not have site-specific financial assurance for this project; however, Operator has inactive well, blanket, and surface bonding including Surety IDs 106077122, 106473808, and 106473820, as well as commercial general liability and/or umbrella/excess insurance meeting the requirements of Rule 705.b. Operator does not anticipate making an insurance claim for this project.

- Source mass removal is complete
- Supplemental site investigation activities are ongoing to evaluate residual pH, arsenic, and barium levels encountered at the Site.

Costs included herein are estimates only and may change over time based on numerous factors. Accordingly, Operator makes no guarantees as to the accuracy of such cost estimates, thus providing an estimate for the next year below.

Operator anticipates the remaining cost for this project to be: \$ 8000

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

Volume of E&P Waste (solid) in cubic yards 7

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Waste Management's North Weld Landfill in Ault, CO

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 Stugart Sec. 20 facility is an active facility and there are no current plans for decommissioning or reclamation 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. 05/30/2023

Actual Spill or Release date, or date of discovery. 05/28/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/28/2023

Proposed site investigation commencement. 06/01/2023

Proposed completion of site investigation. 12/29/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/04/2023

Proposed date of completion of Remediation. 08/04/2023

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

PDC submitted Supplemental Form 19 (Document #403508768) requesting closure for Spill/Release #484756. On 9/29/23, ECMC removed the closure request and issued 4 COAs.

One excavation base and four sidewall confirmation soil samples will be collected using hand auger equipment from 0.5 feet below ground surface (bgs) in the locations where the initial, discrete excavation samples (submitted as a composite sample) were collected to reconfirm removal of impacted soil at the release area. All soil samples will be analyzed for the full ECMC Table 915-1 suite of analytes by ECMC approved methods. Refer to the attached Figure 2 for an illustration of the excavation soil sample locations.

Additionally, PDC will resample the soil at the SS-30 6.0" location at 0.5 ft bgs where pH was reported at 8.43 to confirm the initial results were anomalous and demonstrate pH levels are within the Table 915-1 range. The sample will be analyzed for pH only by ECMC approved methods.

In response to COA #1: Groundwater was measured between 8.4 feet and 22 feet bgs in monitoring wells installed in 2019, 0.67 miles northeast and topographically cross-gradient of the release area (Well Permit No. 059215). The boring logs and well construction reports associated with these wells are attached. Based on a review of the boring logs, local lithology is characterized by clayey sand to approximately 5 feet bgs, followed by claystone to 22 feet bgs. The confining nature of the lithology noted in the boring logs suggests communication of the fluids released with groundwater is improbable given the vertical separation of approximately 8 feet. In addition, cleanup commenced immediately following the release and soil impacts were limited to the road base surface to approximately 0.5 feet bgs, as confirmed by laboratory results from the composite soil sample. Based on this data, RSSLs are appropriate for requesting a No Further Action (NFA) determination for this project. Refer to the attached Figure 6 for an illustration of the location of the referenced monitoring wells.

In response to COA #2 and COA #3: Background samples BKG-1 to BKG-5 are representative of the road base and fill material used to raise and level the pad 1 foot to 2 feet above the preexisting grade. The samples were collected on-site, in the margins of the pad, away from drilling activity, in fill material analogous to soil impacted by the release. As discussed in a phone call with the ECMC on 10/19/23, the analytical data from these background samples will not be omitted from future background determination calculations.

The arsenic concentrations in all 13 confirmation soil samples collected on 6/1/23 and 6/2/23 and in the composite soil sample collected on 8/4/23 were less than the calculated 125% of average background concentration for arsenic (3.915 mg/kg).

As requested by the ECMC, PDC proposes to collect three additional background soil samples. Two will be collected near the excavation in the road base and fill material used to raise and level the pad, and one will be collected in the agricultural field to the northwest of the release area in native material. The three samples will be collected from 0.5 feet bgs using hand auger equipment and analyzed for Table 915-1 Soil Suitability for Reclamation parameters and Metals in Soils by ECMC approved methods. Refer to the attached Figure 5 for an illustration of the proposed background soil sample locations.

In response to COA #4: All Figures have been updated and are attached.

The proposed soils sampling activities will be conducted prior to the next quarterly supplemental Form 27 submission. Analytical results will be summarized.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Jason Davidson

Title: Senior Env. Specialist

Submit Date: 10/28/2023

Email: FRspillremediationcontractor@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: Taylor Robinson

Date: 11/06/2023

Remediation Project Number: 32427

COA Type

Description

COA Type	Description
1 COA	ECMC approves Operator's request for use of Residential SSLs based on the depth to groundwater and the local lithology suggesting a pathway to groundwater at this location is not likely.

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
403565462	INVESTIGATION/REMEDATION WORKPLAN (INITIAL)
403574402	LOGS
403575303	SITE INVESTIGATION REPORT

Total Attach: 4 Files

General Comments

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

Total: 0 comment(s)