

State of Colorado
Energy & Carbon Management Commission

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Report taken by:
Alexander Ahmadian

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 ECMC 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: PDC ENERGY INC Operator No: 69175 Phone Numbers
Address: 1099 18TH STREET SUITE 1500 Phone: (970) 313-5582
City: DENVER State: CO Zip: 80202 Mobile: ()
Contact Person: Jason Davidson Email: ENspillremediationcontractor@pdce.com

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 33383 Initial Form 27 Document #: 403603783

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

Yes Multiple Facilities

Facility Type: LOCATION Facility ID: 320186 API #: County Name: ADAMS
Facility Name: GREAT WESTERN BOX ELDER FARMS 1 Latitude: 39.954850 Longitude: -104.653744
** correct Lat/Long if needed: Latitude: 39.954888 Longitude: -104.654138
QtrQtr: NENW Sec: 22 Twp: 1S Range: 65W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Residential
Is domestic water well within 1/4 mile? Yes 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

Closest Domestic Well within quarter mile – 1,265' NW
Additional Domestic Wells – 1,250' S
Nearest Surface Water – None
Nearest Occupied Building – 570' NNE
Additional Occupied Buildings – 915' NW, 1,110' SSE, 1,110' SSW

No other potential receptors are located within ¼ mile of the Site.
Above distances are approximations.



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
No	GROUNDWATER	Not impacted	Not encountered
Yes	SOILS	75' square x 4' 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.

In accordance with ECMC Rule 911, this form serves as notification for the decommissioning and abandonment of the Box Elder 1 production facility, Box Elder 1 wellhead, and removal of the associated flowline. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning. In addition, on-site dump lines located between the separator and tank battery will be removed by pulling from either end during decommissioning activities. Field observations and photo documentation will be recorded in a field inspection form for submittal to the ECMC.

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):

Soil samples will be collected from the surface in cardinal directions of the wellhead and grab soil samples will be collected below and/or adjacent to applicable facility equipment, as defined in the Rule 911.a.(4) guidance document (9/20/21), for field screening purposes. Discrete soil samples will be collected for laboratory analysis either in any area of observed hydrocarbon impacts, or in the sample locations designated by the ECMC. Soil samples will be collected at the tank battery, and adjacent to the wellhead from native material and will be submitted for laboratory analysis of the full Table 915-1 analytical suite by ECMC approved methods. See the attached Figure 1 for an illustration of the facility layout and proposed soil sample locations.

Proposed Groundwater Sampling

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

If groundwater is encountered during decommissioning and/or abandonment activities, a grab sample will be collected as soon as practical. If contaminated soil is in contact with groundwater or if free product/hydrocarbon sheen are observed, the release will be reported in accordance with Rule 912.b. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260, chloride and sulfate anions by EPA Method 300.0, and total dissolved solids (TDs) by Method SM 2540C.

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 a produced water vessel is present, discrete soil samples will be collected from the base of the excavation and excavation sidewall in areas most likely to be impacted and exhibiting the highest field screened VOC concentration and submitted for laboratory analysis of the full Table 915-1 analytical suite. Assessments will be conducted during the removal of the on-location flowline (~150 feet in length) and soil samples will be collected below the flowline risers. The flowline and adjacent sub-surface will be inspected for visual and olfactory indicators of potential failure and hydrocarbon impacts. Soils will be field screened below the flowline and if suspected impacts are observed, a soil sample will be collected and submitted for analysis of the full Table 915-1 analytical suite.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 22
Number of soil samples exceeding 915-1 8
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 75

NA / ND

-- Highest concentration of TPH (mg/kg) 370
-- Highest concentration of SAR 1.22
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 4

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 1/11/2024, twelve background samples were collected from approximately 4 ft., 6 ft., and 8 ft-bgs from 4 soil borings (BKG01-BKG04) in areas away from oil and gas infrastructure and were submitted for analysis of pH, arsenic, and barium by ECMC approved methods.

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.

One facility closure confirmation soil sample (FLR01@4) collected from adjacent to the wellhead flowline riser reported benzo(a)anthracene slightly above the Table 915-1 GWSSL. Two facility closure confirmation soil samples (SEP01-DL@4 and AST01@1) collected from adjacent to the separator dump line and beneath the access hatch of the AST reported pH levels below the Table 915-1 standard. Three facility closure confirmation soil samples (WH01@8, WDL01@4, and PWV01@5) collected from adjacent to the wellhead, adjacent to the water dump line, and adjacent to the produced water vessel reported pH levels above the Table 915-1 standard. The historic release was reported in Form 19 Document #403669853.

On April 19, 2024, approximately 16 cubic yards of material were excavated from adjacent to the former wellhead flowline riser, adjacent to the former separator dump line, and from beneath the access hatch of the former AST. The material was removed and transported offsite under PDC manifest to Waste Management's North Weld Landfill in Ault, Colorado in accordance with Rules 905 and 906. Copies of the waste manifests are available upon request.

Following excavation, fifteen confirmation soil samples were collected from the walls and base of the excavations and submitted to Summit Scientific (Summit) in Golden, Colorado for analysis of the reduced list of analytes approved in Form 27 Document #403687194. Please refer to the Operator Comments section of this Form 27 for additional discussion.

REMIATION 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.

Please refer to the Source Removal Summary section above and to the Operator Comments section of this Form 27 for additional discussion.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 16

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or ECMC Facility ID # _____

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ 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 initial decommissioning nor during excavation activities.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

Quarterly Semi-Annually Annually Other Final Closure 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 Final Closure 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.

- The project has been completed and no further assessment or remediation is required at this time.

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: \$ 1000

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 16

E&P waste (solid) description Hydrocarbon impacted soil

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Waste Management North Weld
Landfill in Ault, CO

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

E&P waste (liquid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? Yes

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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

Does Groundwater meet Table 915-1 standards? Yes

Is additional groundwater monitoring to be conducted? _____

Operator shall comply with the ECMC 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.

Following facility closure activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. Reclamation will be conducted in accordance with ECMC 1004 Series Rules.

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. 04/19/2024

Proposed date of completion of Reclamation. 04/19/2026

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. 11/08/2023

Actual Spill or Release date, or date of discovery. 01/29/2024

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/11/2024

Proposed site investigation commencement. 01/11/2024

Proposed completion of site investigation. 07/11/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 04/19/2024

Proposed date of completion of Remediation. 04/19/2024

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

Denied 11/05/2024 This Form 27 serves as a closure request for facility closure and excavation activities that have occurred at the former Box Elder Farms 1 wellhead and production facility. One facility closure confirmation soil sample (FLR01@4), collected from adjacent to the wellhead flowline riser, reported benzo(a)anthracene above the Table 915-1 GWSSL, and two facility closure confirmation soil samples (SEP01-DL@4 and AST01@1), collected from adjacent to the separator dump line and beneath the access hatch of the AST, reported pH levels below the Table915-1 standard.

Twelve site-specific background samples were collected from 4 background soil borings (BKG01 through BKG04) from approximately 4 ft., 6 ft., and 8 ft-bgs in areas away from oil and gas infrastructure and were submitted for analysis of pH, arsenic, and barium by ECMC approved methods. Based on initial facility closure and background soil sample results, PDC requested a reduced analyte list for additional soil sampling activities at the facility to include BTEXN, TMBs, TPH, Table 915-1 PAHs excluding 1-methylnapthalene and 2-methylnapthalene, and pH. The reduced analyte list was approved on March 28, 2024, in Form 27 Document #403687194.

Excavation at the three locations for FLR01@4, SEP01-DL@4, and AT01@1 was conducted on April 19, 2024. Five excavation confirmation soil samples were collected from the floor and sidewalls of each excavation and submitted for analysis of the analytes listed above.

Analytical results for eight of the facility closure and excavation soil samples remaining in place reported pH levels above the highest reported background pH level of 8.52, reported for background soil sample BKG04@8. Nine of the twelve background soil samples submitted for analysis reported levels above the standard of 8.30. Thus, elevated pH levels onsite are interpreted to be representative of naturally occurring background conditions per the abundance of elevated pH in background samples. This relationship is illustrated visually by a box and whisker plot, and a scatter plot of the data, provided as Appendix A. Furthermore, for each sample where a pH exceedance is reported, there is no other indication in the data that elevated pH is due to impact by hydrocarbons or produced water. All organics for excavation confirmation soil samples were reported as non-detect, and EC, SAR, and boron were reported as compliant with Table 915-1 standards for facility closure confirmation soil samples WH01@8, WDL01@4, and PWV01@5.

Sample location information is provided in Table 1 and the analytical results are summarized in Table 2, Table 3, and Table 4. Soil sample and field screening locations are presented on Figures 2-4. A photolog and the laboratory analytical reports are also attached.

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

Signed: Jason Davidson

Title: Remediation Advisor

Submit Date: 08/13/2024

Email: ENspillremediationcontractor@pdce.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved:

Date:

Remediation Project Number: 33383

COA Type

Description

COA Type	Description
0 COA	

ATTACHMENT 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

403876701	FORM 27-SUPPLEMENTAL-SUBMITTED
403876731	ANALYTICAL RESULTS
403876732	ANALYTICAL RESULTS
403876734	MAP
403876735	SOIL SAMPLE LOCATION MAP
403876742	OTHER
403876759	PHOTO DOCUMENTATION
403877769	SOIL SAMPLE LOCATION MAP
403877770	ANALYTICAL RESULTS
403887045	SOIL SAMPLE LOCATION MAP

Total Attach: 10 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	ECMC has denied this form for the following reasons: - Per laboratory check in documentation, soil samples were received by the laboratory three days after the samples were taken, without ice and out of temperature. Operator shall collect future confirmation soil samples as described in the Rule 915.e.(2) Guidance Document. To prevent loss of volatile constituents prior to analysis, samples for volatile organic compounds ("VOC's") will be collected in a manner that minimizes disturbance of the sample and will be immediately placed in an appropriate laboratory supplied container and placed on ice. - pH of 3.60, 9.10, and 5.13 is not within the acceptable range of soil variability. Operator shall collect additional samples and analyze for Full Table 915-1.	11/05/2024

Total: 1 comment(s)

