

State of Colorado
Energy & Carbon Management Commission

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Document Number:
404609723

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 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: <u>PDC ENERGY INC</u>	Operator No: <u>69175</u>	Phone Numbers Phone: <u>(970) 304-5000</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>Kris Shepherd</u>	Email: <u>RBUEUF27@chevron.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 17900 Initial Form 27 Document #: 402673768

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>WELL</u>	Facility ID: _____	API #: <u>123-13306</u>	County Name: <u>WELD</u>
Facility Name: <u>KIELIAN 2-2</u>	Latitude: <u>40.336220</u>	Longitude: <u>-104.850500</u>	
** correct Lat/Long if needed: Latitude: <u>40.336220</u>		Longitude: <u>-104.850500</u>	
QtrQtr: <u>SESE</u>	Sec: <u>2</u>	Twps: <u>4N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use Residential

Is domestic water well within 1/4 mile? Yes 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 Kielian 2-2 wellhead and ~300-foot flowline are surrounded by private ranching and agricultural mixed-use properties in all directions. There are residential properties ~550' southwest and southeast. The flowline runs southeast from the wellhead to the tank battery. The tank battery is located ~250' southeast of the wellhead. A small pond is in place ~50' west and a gravel pit is in place ~650' east of the flowline. The Thompson and Platte Ditch is in place ~1,180' south of the flowline and the Big Thompson River flows to the east ~1,300' northwest of the wellhead. There are 2 groundwater wells mapped within a ¼ mile of the wellhead and flowline. Groundwater depth is unknown but expected to be encountered at <20' bgs. The wellhead is located inside the 100-year floodplain of the Big Thompson River drainage. The wellhead is also located within a Mule Deer Severe Winter Range Buffer and an Aquatic Native Species Conservation Waters buffer is mapped ~775' northwest of the wellhead.

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 checked="" 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
No	GROUNDWATER	Not Impacted	Quarterly Groundwater Sampling
No	SOILS	Impacted soils removed	Excavation/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.

Cut and cap activities and confirmation soil and groundwater sampling at the Kielian 2-2 wellhead initially occurred on 6/7/2021. Analytical results reported for the eastern sidewall sample (SS3-3) indicated concentrations above applicable Table 915-1 Protection of Groundwater Soil Screening Levels (GWSSLs) for 1,2,4 trimethylbenzene (TMB), 1,3,5 TMB, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, arsenic, barium, selenium, EC, and SAR. Analytical results for the northern sidewall sample (SS1-0.5) indicated concentrations above the applicable Table 915-1 GWSSLs for EC, SAR, and boron.

Groundwater was encountered at 4 ft-bgs and one grab groundwater sample (GW01) was collected from the wellhead excavation. All analytical results were compliant with the applicable Table 915-1 Organic Compounds in Groundwater. Additional information on subsequent excavation activities is provided in the Remediation Summary and Operator Comments sections of this Form 27.

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):

Four consecutive groundwater monitoring events have been reported in compliance with applicable ECMC Table 915-1 groundwater standards for Organic Compounds in Groundwater and chloride ion. In accordance with a COA issued in the Supplemental Form 27 Document Number 403671013, PDC continued to sample TDS and sulfate in groundwater for two additional quarters to verify a downward trend or compliance with background concentrations. See the Groundwater Monitoring section of this Form 27 for additional information.

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 915-1 0
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 0

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 7.82
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 0

Groundwater

Number of groundwater samples collected 0
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 3
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l) _____
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
0 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?

In May and July 2021, five (5) background samples were collected from the 0.5 ft, 1 ft, and 3 ft below ground surface (bgs) intervals and analyzed for EC, SAR, boron, arsenic, barium, and selenium, with the exception of BG1-1, which was only analyzed for arsenic and barium.

In August 2025, nine (9) additional background samples were collected from three (3) soil borings from the 6 ft-bgs, 8 ft-bgs, and 10 ft-bgs intervals and analyzed for full Table 915-1 metals.

In November 2025, twenty-four (24) additional background samples were collected at approximately 2 ft, 6 ft, 8 ft, and 10 ft-bgs and analyzed for full Table 915-1 metals.

All background samples were collected in areas away from potential sources of impact related to the Site. Laboratory analytical results indicate that EC, SAR, pH, boron, arsenic, barium, cadmium, hexavalent chromium, lead, nickel, and selenium exist naturally, or as the result of ranching activities, in soils at levels exceeding ECOM GWSSLs.

Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) 79 Volume of liquid waste (barrels) 0

Is further site investigation required?

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

On July 14, 2021, approximately 29 cubic yards of hydrocarbon impacted soil was excavated and transported offsite for disposal under Great Western manifest at Waste Management's North Weld Landfill in Ault, Colorado in accordance with Rules 905 and 906.

On April 11 and 12, 2022, an additional approximately 50 cubic yards of soil with inorganic impacts was excavated and transported offsite for disposal under Great Western manifest at Waste Management's North Weld Landfill in Ault, Colorado in accordance with Rules 905 and 906.

REMEDICATION 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.

Based on initial facility closure results, source removal excavation and confirmation soil sampling was conducted on 7/14/2021, to remove the identified impacts. The final extent of the excavation measured approximately 18 feet by 12 feet by 3 feet deep and approximately 29 cubic yards of impacted material was removed. Four sidewall confirmation soil samples were collected from the final extent of excavation and all analytical results were compliant with applicable Table 915-1 GWSSLs or below local background concentrations, except for SAR in sample EX03-2 (35.0).

On 9/20/2022, one sample (SS4-2) was collected with a hand auger to laterally delineate the elevated levels of SAR encountered in sample EX03-2. Laboratory analytical results for SS4-2 reported SAR below the applicable Table 915-1 GWSSL.

On 4/11/2022, excavation was conducted to remove the elevated SAR levels remaining around sample EX03-2. The final extent of excavation measured approximately 15 feet by 15 feet, extending northeast from the initial excavation to the prior compliant sample location SS4-2. The total depth extended to approximately 5 ft-bgs, where the prior vertical delineation of SAR was demonstrated in sample SB01-5. Approximately 50 cubic yards of soil were removed. Two confirmation sidewall soil samples (EX05-3 and EX06-3) were collected at 3 ft-bgs from the northwest and southeast sidewalls, respectively, and were submitted to Origins Laboratory in Denver, Colorado, for analysis of SAR. Laboratory analytical results reported SAR levels in both samples below the applicable ECOM Table 915-1 cleanup concentration.

On 4/4/2023, three monitoring wells (MW01 through MW03) were installed at the Site using a direct push drilling rig operated by Site Services Drilling, LLC, with oversight by Entrada Consulting Group. The wells were constructed of 1-inch PVC casing and installed to a total depth of 12 ft-bgs with 10 feet of 0.010-inch slotted screen extending from total depth.

Soil Remediation Summary

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> Ex Situ
_____ Bioremediation (or enhanced bioremediation)	Yes _____ Excavate and offsite disposal
_____ Chemical oxidation	_____ If Yes: Estimated Volume (Cubic Yards) _____ 79
_____ Air sparge / Soil vapor extraction	_____ Name of Licensed Disposal Facility or ECOM 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 monitoring was conducted at three wells at the Site from April 2023 through July 2024. Groundwater at the Site was granted closure status in Form 27 Document Number 403920534, approved September 18, 2024.

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

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.

- Groundwater monitoring has been completed.
- Delineation activities have been completed.
- Source removal is complete.
- Additional samples were re-collected and submitted for Full Table 915-1 analysis by ECMC approved methods.
- Additional background samples were collected in the vicinity of the former wellhead to evaluate inorganic exceedances at the Site.
- PDC has completed statistical analysis to evaluate inorganics concentrations 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: \$ 5000

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:

Volume of E&P Waste (solid) in cubic yards 79

E&P waste (solid) description Hydrocarbon impacted soil

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC 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 _____

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 wellhead cut and cap activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The location will be reclaimed in accordance with the ECMC 1000 series.

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. 03/31/2025

Proposed date of completion of Reclamation. 03/31/2027

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. 04/13/2021

Actual Spill or Release date, or date of discovery. 06/07/2021

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/28/2021

Proposed site investigation commencement. 04/04/2023

Proposed completion of site investigation. 11/20/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 04/11/2022

Proposed date of completion of Remediation. 11/20/2025

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:

Proposed completion of site investigation and proposed completion of remediation updated to reflect final soil sampling event.

OPERATOR COMMENT

This form has been prepared as a Q2 2026 quarterly update for PDC's former Kielian 2-2 wellhead. The two previous submittals, Form 27 Document Numbers 404381850 and 404468425, have not been reviewed/approved by ECMC at the time of this submittal.

On 12/12/2024, PDC collected one additional soil sample to vertically delineate soil impacts reported for confirmation soil sample SS3-3, described above in the Initial Action Summary section of this Form 27. The soil sample SS3@4-8 was collected from 4-8 ft-bgs using a geoprobe and continuous soil sampling equipment. The sample was submitted for analysis of Full Table 915-1 constituents by ECMC approved methods. All organics were reported as non-detect, and arsenic was reported above the Table 915-1 standard (0.596 mg/kg), but less than the site-specific calculated background standard of 4.09 mg/kg. A revised figure showing the location of SS3@4-8, along with comprehensive data tables and analytical reports, and a boring log, was included in Form 27 Document Number 404108665.

On 8/14/2025, soil samples SS4-2, EX01-2, EX02-2, EX04-2, EX05-3, EX06-3 and SB01-5 were re-collected and submitted for Full Table 915-1 analysis by ECMC approved methods. All soil samples collected were compliant with full Table 915-1 GWSSL standards or 1.25x max background levels with the exception of the following: arsenic was reported above its respective GWSSL standard and 1.25x max background level in soil samples SS4-2, EX01-2, and EX06-3. Boron was reported above its respective GWSSL standard and max background level in soil samples EX01-2 and EX04-2. Lead was reported above its respective GWSSL standard and 1.25x max background level in soil sample EX01-2. Revised tables, figures, and the laboratory analytical reports for the August 2025 sampling event were included with Form 27 Document Number 404381850.

In November 2025, twenty-four (24) additional background samples were collected at approximately 2 ft, 6 ft, 8 ft, and 10 ft-bgs and analyzed for full Table 915-1 metals. Revised tables, figures, and the laboratory analytical report for the November 2025 sampling event were included with Form 27 Document Number 404468425.

A statistical analysis was completed to compare boron concentrations for soil samples remaining in place to boron concentrations reported for background soil samples. The results of the Gehan Test using Test Form 1 are that boron concentrations reported for Site samples are representative of native background conditions. The Statistical Comparison to Background for Boron using the Gehan Test Form 1 report provided by Geosyntec is included in this submittal.

Based on the data presented, PDC respectfully requests closure of Remediation Project Number 17900. A general location map is provided as Figure 1. Soil and groundwater analytical and excavation results are presented on Figure 2. Background soil sample locations are presented on Figure 3. Soil analytical results are summarized in Table 2, Table 3, and Table 4. Grab groundwater analytical results are summarized in Table 5. Comprehensive encrypted analytical reports to support closure for this project are also attached.

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

Signed: Zach Solow

Title: Project Geologist

Submit Date: _____

Email: PDCFR@entradainc.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: 17900

COA Type

Description

0 COA	
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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
404609902	SITE MAP
404609905	SOIL SAMPLE LOCATION MAP
404609907	SOIL SAMPLE LOCATION MAP
404609910	ANALYTICAL DATA SUMMARY TABLE(S)
404609911	OTHER
404609917	LABORATORY ANALYTICAL REPORT
404609943	LABORATORY ANALYTICAL REPORT
404609945	LABORATORY ANALYTICAL REPORT
404609946	LABORATORY ANALYTICAL REPORT

404609948	LABORATORY ANALYTICAL REPORT
404609951	LABORATORY ANALYTICAL REPORT
404609954	LABORATORY ANALYTICAL REPORT
404609958	LABORATORY ANALYTICAL REPORT
404609961	LABORATORY ANALYTICAL REPORT
404609963	LABORATORY ANALYTICAL REPORT
404609964	LABORATORY ANALYTICAL REPORT
404609966	LABORATORY ANALYTICAL REPORT
404609967	LABORATORY ANALYTICAL REPORT

Total Attach: 18 Files

General Comments

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

Total: 0 comment(s)