

State of Colorado
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203
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Document Number:

404125068

Receive Date:

03/28/2025

Report taken by:

Nick Cholas

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 Phone: (303) 860-5800 Mobile: ()
Address: 1099 18TH STREET SUITE 1500		
City: DENVER	State: CO Zip: 80202	
Contact Person: Karen Olson	Email: Karen.olson@chevron.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 31424 Initial Form 27 Document #: 403480268

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: 311389	API #:	County Name: WELD
Facility Name: IKENOUYE-65N65W 29NWSE	Latitude: 40.367400	Longitude: -104.682790	
** correct Lat/Long if needed: Latitude: 40.367708		Longitude: -104.682225	
QtrQtr: NWSE	Sec: 29	Twp: 5N	Range: 65W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE	Facility ID: 485551	API #:	County Name: WELD
Facility Name: Ikenouye F 29-22,23 Tank Battery	Latitude: 40.367910	Longitude: -104.682303	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWSE	Sec: 29	Twp: 5N	Range: 65W Meridian: 6 Sensitive Area? Yes

Facility Type: <u>SPILL OR RELEASE</u>		Facility ID: <u>485684</u>		API #: _____		County Name: <u>WELD</u>	
Facility Name: <u>C-AST IkenouyeF29-22,23Tank Battery</u>				Latitude: <u>40.367825</u>		Longitude: <u>-104.682188</u>	
** correct Lat/Long if needed: Latitude: _____				Longitude: _____			
QtrQtr: <u>NWSE</u>	Sec: <u>29</u>	Twp: <u>5N</u>	Range: <u>65W</u>	Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

Facility Type: <u>SPILL OR RELEASE</u>		Facility ID: <u>485685</u>		API #: _____		County Name: <u>WELD</u>	
Facility Name: <u>S-AST IkenouyeF29-22,23Tank Battery</u>				Latitude: <u>40.367777</u>		Longitude: <u>-104.682182</u>	
** correct Lat/Long if needed: Latitude: _____				Longitude: _____			
QtrQtr: <u>NWSE</u>	Sec: <u>29</u>	Twp: <u>5N</u>	Range: <u>65W</u>	Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Agricultural

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

Nearest Well: Domestic - 1,273' SSW; Surface Water: South Platte River - 272' NW; Occupied Building: 1,165' S; Livestock: 745' S; FWS Wetlands: 192' W Forest/Shrub Riparian (Rp1FO); HPH Sensitive Wildlife Habitat: Rule 1202.c: Site Within Aquatic Native Species Conservation Area; Rule 1202.c: 443' NW - Aquatic Sportfish Management Waters; Rule 1202.d: Tank Battery Within Mule Deer Severe Winter Range; Rule 1202.d: Tank Battery Within Mule Deer Winter Concentration Area; Tank Battery Within 100-Year Floodplain.

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	GROUNDWATER	Refer to Tables and Figures	Confirmation Groundwater Sampling
Yes	SOILS	Refer to Tables and Figures	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.

On October 30, 2023, field screening and confirmation soil sampling activities were conducted in accordance with the ECMC Rule 911 during the decommissioning of the Ikenouye F29-22, 23 tank battery. On October 31, 2023, it was determined that a historic release was discovered when visually impacted soils were observed in contact with groundwater at the produced water vaults (PWVs) and reported on under ECMC Spill/Release Point ID 485551. Two additional historical releases were discovered on November 10, 2023, upon receipt of final analytical results. The first release was discovered below the center above ground storage tank (AST02, Spill/Release Point ID 485684). The second release was discovered below the southern AST (AST03, Spill/Release Point ID 485685). Following the discovery of the releases, mitigation activities were initiated. Excavation activities are ongoing and total volumes of soil and groundwater removed during mitigation activities will be included in a forthcoming Supplemental 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):

On October 31, 2023, one soil sample (WC01) was collected from the PWV source area at approximately 4 feet below ground surface (bgs). The sample was submitted for laboratory analysis of the full ECMC Table 915-1 analytical suite. Analytical results indicated that site specific COCs include: benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH[C6-C36]), 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, 1-methylnaphthalene (M), & 2-M.

Proposed Groundwater Sampling

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

On October 31, 2023, groundwater was encountered at approximately 6.5 feet bgs in the PWV excavation. Consequently, one groundwater sample (GW01) was collected from the excavation and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB. Analytical results indicated that benzene, ethylbenzene, xylene, 1,2,4-TMB, & 1,3,5-TMB were in exceedance of the applicable ECMC Table 915-1 standards.

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):

During initial closure activities conducted on October 30, 2023, soil encountered on-site and below production equipment was visually inspected and field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). Per the approved proposed sampling plan, samples were collected below and/or adjacent to the above ground storage tanks (ASTs), separator flowlines, & separator dump lines (SEP01-FL, SEP02-FL, SEP01-DL, & SEP02-DL), and submitted for analysis of Table 915-1 Organic Compounds in Soil and TPH (C6-C36). Soil samples SEP01-FL, SEP02-FL, SEP01-DL, & SEP02-DL were submitted for additional laboratory analysis of pH, EC, SAR, & boron. Additionally, field screened grab soil samples were collected below the emission control devices (ECDs) and meter-house (MH). Analytical results indicated that soil samples were in compliance with the applicable standards, except for the previously mentioned reportable releases in soil samples AST02 & AST03.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 111
Number of soil samples exceeding 915-1 13
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 5400

NA / ND

-- Highest concentration of TPH (mg/kg) 2160
-- Highest concentration of SAR 0.765
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 6

Groundwater

Number of groundwater samples collected 11
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 4
Number of groundwater monitoring wells installed 11
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
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 October 30, 2023, two background soil samples (BKG01 @ 2.5' and BKG01 @ 4') were collected from native material topographically up-gradient of the tank battery location and submitted for laboratory analysis of ECMC Table 915-1 Metals and SAR.

On January 11, 2024, two background soil boring (BKG01 & BKG02) were advanced within native material topographically up-gradient of the tank battery location with soil samples being collected from each soil boring at approximately 2.5 feet, 4 feet, 6 feet, and 7 feet bgs. Background soil samples were submitted for laboratory analysis of pH.

On November 21, 2024, seventeen additional background soil samples were collected from five discrete soil borings (BKG04 - BKG09) at depths ranging between 11 and 13 ft. bgs, and submitted for analysis of ECMC Table 915-1 metals, pH, EC, SAR, and Boron. A secured analytical data report is pending. Upon receipt of a secured report, analytical findings will be summarized and provided on a subsequent Form 27.

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

Volume of solid waste (cubic yards) 2727 Volume of liquid waste (barrels) 4930

☒ Is further site investigation required?

On June 3, 2024, 11 monitoring wells (BH01 – BH11) were installed to delineate dissolved-phase hydrocarbon impacts within and surrounding the former excavation extent. Lithologic descriptions and VOC concentrations measured using a PID were recorded for each monitoring well. Per the approved Supplemental Form 27 (Document No. 403711161), 22 soil samples were collected at depths ranging from 5-6 feet to 11-12 feet bgs and were submitted to Summit for analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, TPH [C6-C36], benzo(a)anthracene, 1-M, 2-M, and table 915 metals.

Based on analytical results, further site investigation activities were conducted on November 21, 2024 to vertically and horizontally delineate cadmium, nickel, and selenium exceedances observed in soil boring BH04@11-12' and to continue to assess cadmium, nickel, and selenium concentrations in native soil on site. Thirteen soil samples were collected and submitted for laboratory analysis of the full ECMC Table 915-1 constituents. A secured analytical data report is pending. Upon receipt of a secured report, analytical findings will be summarized and provided on a subsequent Form 27.

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 October 31, 2023 & March 11, 2024, approximately 2,727 cubic yards (CY) of impacted material were removed from the Ikenouye F29-22, 23 Tank Battery and transported to the North Weld Waste Management landfill for disposal under PDC waste manifests. Additionally, groundwater vacuum recovery was conducted concurrent with excavation activities and approximately 4,930 barrels (BBLs) of groundwater were removed from the Ikenouye F29-22, 23 Tank Battery excavation and transported to NGL C3 for disposal under PDC waste manifests.

Between October 30 & November 10, 2023, three historic releases were discovered following discovery of impacts in contact with groundwater and receipt of final analytical results from soil samples collected during decommissioning activities at the Ikenouye F29-22, 23 tank battery, respectively. Soil sample (WC01) was collected at approximately 4 feet bgs and was submitted for laboratory analysis of the full Table 915-1 analytical suite. Soil samples AST02 & AST03 were collected at approximately 0-6 inches bgs below the central and southern above ground storage tanks, respectively, and submitted for Table 915-1 Organic Compounds in Soil and TPH (C6-C36). Analytical results indicated that organic compound concentrations were in exceedance of the applicable standards in the following:

WC01 @ 4': benzene, ethylbenzene, xylene, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36), 1-M, & 2-M.
AST02 @ 0-6": 1-M
AST03 @ 0-6": 1,3,5-TMB

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.

Between October 31, 2023 & March 11, 2024, excavation activities were conducted and seventy-seven (77) soil samples (SS01-SS20, SS22, SS23, SS25-SS43, SS45, SS46, & SS48-SS81) were collected from the base and sidewalls of the final excavation extent at depths ranging between 6 inches and 7 feet bgs and were submitted for laboratory analysis of the previously mentioned COCs. Based off of potential comingling of spills, soil samples SS31-SS43, SS45, SS46, & SS48-SS81 were submitted for additional analysis of the Table 915-1 PAH suite, to mitigate hydrocarbon impacts. Analytical results indicated benzanthracene exceedances were observed in soil samples SS31, SS34, SS41, SS45, SS53, SS63, SS66, SS70, & SS74. Soil samples SS21, SS24, SS44, & SS47 were collected at 2.5 feet bgs and submitted for laboratory analysis of pH, EC, SAR, & boron. Analytical results indicated that constituent concentrations were below the ECMC Table 915-1 standards or applicable background concentrations in all samples collected from the final excavation extent.

A Site Assessment was conducted on 11/21/2024 to delineate impacted soil, during which four soil borings were advanced. BH12 was advanced at the same location as BH04 to vertically delineate impacts at that location. BH13-BH15 were advanced surrounding BH12 to vertically and laterally delineate impacts identified at BH04@11-12'. Soil samples were collected and analyzed for the full ECMC Table 915-1 analytical suite. A secured analytical data report is pending. Upon receipt of a secured report, analytical findings will be summarized and provided on a subsequent Form 27.

Monitored natural attenuation (MNA) was the selected remediation strategy for this location during the third quarter 2024 and will remain the selected remediation strategy through the second quarter 2025.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 2727

_____ 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.

PDC will conduct quarterly groundwater monitoring at the 11 site monitoring wells (BH01 - BH11) until closure criteria are met. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260, chloride and sulfate anions by EPA Method 300.0, and total dissolved solids (TDS) by Method SM 2540C in accordance with Table 915-1.

The first quarter 2025 groundwater monitoring event was conducted on January 23, 2025, and a secured analytical data report is pending. Upon receipt of a secured report, analytical findings will be summarized and provided on a subsequent Form 27.

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 First Quarter 2025 Timeline Update

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.

Financial assurance information was included in the March 2024 Supplemental Form 27 (Document No. 403711161). This section and estimate will be updated on an annual basis until closure criteria are achieved.

Operator anticipates the remaining cost for this project to be: \$ 50000

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 2727

E&P waste (solid) description Hydrocarbon Impacted Soils

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: North Weld Waste Management Facility

Volume of E&P Waste (liquid) in barrels 4930

E&P waste (liquid) description Hydrocarbon Impacted Groundwater

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: NGL C3

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

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?

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards?

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 tank battery decommissioning & source mass removal 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? Yes _____

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. 10/30/2023

Proposed date of completion of Reclamation. 06/30/2025

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. 07/05/2023

Actual Spill or Release date, or date of discovery. 10/31/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 08/18/2023

Proposed site investigation commencement. 11/21/2024

Proposed completion of site investigation. 11/21/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 10/30/2023

Proposed date of completion of Remediation. 06/30/2025

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:

Supplemental site investigation activities were conducted on November 21, 2024. A secured analytical data report is pending. Upon receipt of a secured report, analytical findings will be summarized and provided, and an SSI will be proposed, as applicable, on a subsequent Form 27.

OPERATOR COMMENT

This SF27 represents a 1Q25 TU for the supplemental site investigation (SSI) and quarterly groundwater monitoring results for the former Ikenouye F29 -22, 23 tank battery location conducted during the fourth quarter 2024 and first quarter 2025. The secured analytical data reports are pending. Upon receipt of secured reports, analytical findings will be summarized and provided. SF27s will continue to be submitted on a quarterly basis.

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

Signed: Ben Wagner

Title: Environmental Consultant

Submit Date: 03/28/2025

Email: tas-chevron-4@tasman-geo.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: Nick Cholas

Date: 05/21/2025

Remediation Project Number: 31424

COA Type**Description**

	ECMC has processed this form as an update; no analytical was attached thus approval of this form does not imply any agreement with comments on completion of site investigation. All ongoing/unaddressed comments/COAs from previous Forms remain applicable.
1 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**

404125068	FORM 27-SUPPLEMENTAL-SUBMITTED
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Total Attach: 1 Files

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

Environmental	Operator states: "The secured analytical data reports are pending."	05/21/2025
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Total: 1 comment(s)