FORM 27 Rev 5/22

State of Colorado
Energy & Carbon Management Commission

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Report taken by: Krystal Heibel

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 INFORMATON

Name of Operator: PDC ENERGY INC Operator No: 69175
Address: 1099 18TH STREET SUITE 1500
City: DENVER State: CO Zip: 80202
Contact Person: Karen Olson Email: taspillremediationcontractor@pdce.com

Phone Numbers
Phone: (303) 860-5800
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9950 Initial Form 27 Document #: 200440745

PURPOSE INFORMATION

- [ ] Rule 913.c.(1): Pit or Cuttings Trench closure.
- [X] 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: PIT Facility ID: 258442 API #: County Name: WELD
Facility Name: TOEDTLI 22-2 PIT Latitude: 40.830655 Longitude: -103.736575
** correct Lat/Long if needed: Latitude: 40.831104 Longitude: -103.736561
QtrQtr: NWNE Sec: 22 Twp: 10N Range: 57W Meridian: 6 Sensitive Area? No

SITE CONDITIONS

General soil type - USCS Classifications SP
Most Sensitive Adjacent Land Use Rangeland
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? No

Other Potential Receptors within 1/4 mile

Nearest Well: Stock - 3,457' W; Surface Water: Intermittent Tributary - 1,220' SW; Livestock: 0' (Within Ranch Land); FWS Wetlands: 869' SW Freshwater Pond (PUSA).

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [X] **E&P Waste**
  - [X] Produced Water
  - [ ] Oil
  - [ ] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	Refer to Document No. 403513674	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 28, 2016, site investigation activities were conducted to assess the potential presence of petroleum hydrocarbon impact associated with two historical evaporation pits and one adjacent tinhorn. Please refer to the LTE Site Investigation and Closure Request, dated December 29, 2016, for additional details. Six soil samples were collected from within the pits to evaluate potential hydrocarbon and inorganic impacts to the site. All six soil samples were analyzed for BTEX, and one was analyzed for EC, pH, and SAR. To evaluate background conditions at the site, a total of ten soil samples were collected from five background locations. One sample was collected from 1 foot below ground surface (bgs) and one from 3 feet bgs from each location. The samples were analyzed for EC, pH, and SAR.

Following PDC Energy's acquisition of this location in January 2020, documentation of reclamation activities and confirmation sampling requested by the State were not provided from the previous Operator; therefore, the requested confirmation sampling is detailed below.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[X] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

On September 15, 2021, eleven (11) soil borings were advanced across the former location to evaluate soil sustainability for reclamation. Twenty-two (22) soil samples were collected at approximately 1 foot and 3 feet bgs and were submitted for laboratory analysis of pH, EC, and SAR. Analytical results indicated pH levels and EC concentrations were observed in exceedance of the applicable Table 915-1 standards across soil borings BH01-BH03. Analytical results are summarized in Table 1 and GPS coordinates and field screened VOC concentrations are summarized in Table 2. Field screening and laboratory sample locations are illustrated on Figure 1. The laboratory reports are included as Attachment A and the soil boring logs are included in Attachment B.

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: 22

Number of soil samples exceeeding 915-1: 4

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

Approximate areal extent (square feet): 5500

NA / ND

NA Highest concentration of TPH (mg/kg)

-- Highest concentration of SAR: 1.82

BTEX > 915-1: No

Vertical Extent > 915-1 (in feet): 3

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: 0

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 September 15, 2022, two (2) background soil samples (BKG01) were collected at 1 foot & 3 feet bgs from native material adjacent to the former pit. All background soil samples were submitted for analysis of the pH, EC, and SAR. Analytical results indicated that pH was in exceedance of the applicable regulatory standards in native soil.

On June 2, 2023, sixteen (16) background soil samples (BKG02-BKG04) were collected from depths ranging from 1 foot to 6 feet bgs, from native material surrounding former pit and were submitted for analysis of pH and EC. Analytical results indicated that pH concentrations were in exceedance of the applicable Table 915-1 standard in background soil boring BKG03.

☐ 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?

Up to three (3) soil borings will be advanced at the former pit to horizontally delineate pH exceedances recorded in soil boring SB06. Volatile organic compound (VOC) concentrations using a photoionization detector (PID) and lithologic descriptions will be recorded for each borehole. Soil samples will be collected from 1-foot bgs to obtain horizontal delineation and will be submitted for laboratory analysis of pH.

In addition, two (2) additional background soil borings will be advanced topographically upgradient of the former pit to further evaluate pH in native material. The proposed soil boring locations are illustrated on figure 2.

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.

The Toedtli 22-2 pit and associated facilities have been abandoned.

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.

On June 2, 2023, supplemental site investigation activities were conducted to vertically and horizontally delineate pH and EC constituents. Thirty-two confirmation soil samples (SB01-SB10) were collected at depths ranging from 1 foot to 10 ft bgs and were submitted for laboratory analysis of pH and/or EC in accordance with the 900 Series and Table 915-1. Soil sample analytical results indicated that pH levels were above ECMC standards in soil boring SB06 @ 1'. In addition, EC levels were above applicable standards in soil borings SB02 @ 4', SB02 @ 5', SB02 @ 7', SB05 @ 3' and SB05 @ 4'.

Soil Remediation Summary

☐ **In Situ**

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

☐ **Ex Situ**

- _____ Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) _____
  - Name of Licensed Disposal Facility or ECMC 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 has not been encountered during supplemental site investigation activities at the former Toedtli 22-2 pit.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

[X] Quarterly [ ] Semi-Annually [ ] Annually [ ] Other Fourth Quarter 2023 - Timeline Update

[ ] **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

[X] Other Fourth Quarter 2023 - 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.

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.

-Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the ECMC 1000 Series.
-Investigation and delineation have been completed for organics in soil.
-Investigation and delineation of EC has been complete. Further soil investigation/delineation of pH is required at the former Toedtli 22-2 pit.

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: $ 10000

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? No

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

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

E&P waste (solid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

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? 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? 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.

Upon closure of the pit, this location was backfilled to the pre-existing grade or to match the surrounding topography as much as practical. Due to inorganic exceedances observed during the September 15, 2021 site investigation, additional delineation activities will be conducted at this location. Following the completion of investigation and delineation activities, a site-specific reclamation plan will be developed in accordance with the ECMC 1000 series.

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. 09/13/2028

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.

Actual Spill or Release date, or date of discovery.

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date).

Proposed site investigation commencement. 01/01/2024

Proposed completion of site investigation. 03/31/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation.

Proposed date of completion of Remediation. 09/13/2028

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:

Additional investigation is required to horizontally delineate pH exceedances observed during supplemental site investigation activities. The proposed completion of site investigation date has been adjusted to span through the first quarter 2024. Pending landowner negotiations, crew availability, and favorable site conditions, the proposed site investigation is scheduled to be conducted in March 2024.

OPERATOR COMMENT

This form is being submitted as a fourth quarter 2023 timeline update for the Toedtli 22-2 pit location. Please refer to ECMC document no. 403513674 for previously submitted tables and figures. Supplemental Form 27s will be prepared and submitted on a quarterly schedule to provide updates and progress of the remediation until closure criteria has been achieved.

Pending landowner negotiations, crew availability, and favorable site conditions, supplemental site investigation activities will be conducted to horizontally delineate pH levels that remain in exceedance at this location. Additionally, a site investigation will be conducted in native material to evaluate pH concentrations.

Several COA's were included on the previous Supplemental Form 27 (Document No. 403535989). Please see below for COA's with additional information and responses:

"Operator shall submit a summary table with all the analytical data (historic and new) taken at this location. Operator shall provide documentation that shows no Table 915-1 TPH and 'Organic Compounds in Soil' exceedances exist at this location."

Please see Attachment A for updated Tables including historic and new data for the Toedtli22-2 pit location.

"Operator shall provide a comprehensive list of all potential receptors within ¼ mile on
the subsequent Supplemental Form 27. Location lies within the following mapped High Priority Habitat(s):
- Mule Deer Winter Concentration Area
Please note that Approval of this Form 27 does not supersede any Federal, State or Local regulations. COGCC recommends consultation with Colorado Parks and Wildlife."

An updated High Priority Habitat (HPH) list (effective as of November 30, 2023) removes the HPH Mule Deer Winter Concentration Area designation for the Toedtli 22-2 Pit location.

"Per Doc# 403333291, Operator will submit a specific implementation schedule in accordance with Rule 901.d. (1)."

The proposed site investigation is scheduled to be conducted in March 2024, however, this is dependent on landowner negotiations, crew availability, and favorable site conditions.

Lastly, attached is correspondence with the Environmental Protection Specialist on December 15, 2016, stating that no further action is required to investigate impacts related to hydrocarbon impacts in soil at the pit complex.

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

Signed: Karen Olson Title: Senior Program Manager

Submit Date: 04/23/2024 Email: taspillremediationcontractor@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: Krystal Heibel Date: 06/21/2024

Remediation Project Number: 9950

COA Type	Description
	Operator shall provide a Soil Sample Location Map that illustrates the location of each confirmation soil sample, within the next submittal.
	Operator shall submit reports of site investigation including all laboratory analytical results for all samples collected, per Rule 913.h.(4).A.. Per the 900 Series rules 915.e "... Analyses of samples will be performed by laboratories that maintain state or national accreditation programs.." The main accreditation programs are National Environmental Laboratory Accreditation Program (NELAP) and National Environmental Laboratories Accreditation Conference (NELAC). Not only is this accreditation required the lab has to be accredited for each specific analyte. Operator shall update the analytical table to indicate which analytes were analyzed at a National Environmental Laboratory Accreditation Program (NELAP) and National Environmental Laboratory and which samples were not analyzed at a NELAP and NELAC lab. Table 915-1 Soil Suitability for Reclamation analytes need not be analyzed at a NELAP and NELAC lab.

	The Soil Suitability for Reclamation analytes collected at the Location exceeds the allowable level for Table 915-1 soil suitability for reclamation. Therefore, Operator will define the extent of soil with elevated analytes, and if Operator proposes to leave soil with elevated analytes in place, Operator will submit a Reclamation plan pursuant to Rule 915.b.
	Per Doc#s 403333291 & 403513674, Operator will submit a specific implementation schedule in accordance with Rule 901.d. (1). Operator shall fully populate the implementation schedule in accordance with Rule 913.d on the subsequent Supplemental Form 27.
	Operator shall select "Rule 913.c.(1): Pit or Cuttings Trench closure." within the next form submittal.
5 COAs	

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
403638997	FORM 27-SUPPLEMENTAL-SUBMITTED
403639353	CORRESPONDENCE
403639878	ANALYTICAL RESULTS

Total Attach: 3 Files

General Comments

User Group	Comment	Comment Date
Environmental	Doc#s 403638997 & 403732007 are the same.	06/21/2024
Environmental	Doc #403139288: The Operator has approved the reduced analyte suite of EC, pH, SAR, and BTEX.	06/21/2024

Total: 2 comment(s)