

State of Colorado
Energy & Carbon Management Commission

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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 COGCC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27.

This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATION

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 22766 Initial Form 27 Document #: 403008744

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>LOCATION</u>	Facility ID: <u>436119</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Schmunk EF Offsite Tank Battery 31</u>	Latitude: <u>40.534297</u>	Longitude: <u>-104.701619</u>	
	** correct Lat/Long if needed: Latitude: <u>40.534142</u>	Longitude: <u>-104.701656</u>	
QtrQtr: <u>SWNE</u>	Sec: <u>31</u>	Twps: <u>7n</u>	Range: <u>65w</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SC 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

The Schmunk EF tank battery is surrounded by agricultural land in all directions. An irrigation pond is in place ~430 feet north and irrigation ditches are in place ~1,275 feet west and ~1,320 feet east of the battery. A residential neighborhood is in place ~1,000 feet south. There is one groundwater well mapped within a 1/4 mile of the battery. Groundwater depth is unknown but is expected to be encountered at less than 20 feet below ground surface (bgs). The 100-year floodplain of the Mead Lateral Ditch is mapped ~950 feet southwest of the battery. There are no other sensitive areas, wetland, or wildlife habitats identified within a quarter mile of the wellhead and flowline. See the attached Figure 1 for an illustration of the location of the Site.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

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

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	Refer to Figure 4 & Tables 1 & 2	Groundwater Sampling Activities
Yes	SOILS	3,200' sq x 9' deep	Excavation/Confirmation Soil Sampling Activities

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

A leak from a Balon valve at Condensate Tank #3 resulted in the release of approximately 47 bbls of oil all within unlined secondary containment. The release was discovered during a routine site visit on 2/23/2022 and was immediately stopped and completely contained on-site. Great Western conducted excavation activities inside the steel tank berm utilizing hydrovac equipment on 2/24/2022. All free oil, melted snow, and loose material were removed by the hydrovac. However, the roadbase/surface material was frozen and unable to be excavated. On 4/5/2022, a limited subsurface investigation was conducted with hand auger equipment within the steel tank berm, adjacent to the partially buried produced water tanks and west row of above ground storage tanks (ASTs). Six characterization soil samples were collected from five hand auger borings and submitted to Summit Scientific Laboratory (Summit) in Golden, CO for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB and Gasoline Range Organics (GRO) [C6-C10] by EPA Method 8260 and for Diesel Range Organics (DRO) [C10-C28] and Residual Range Organics (RRO) [C28-C40] by EPA Method 8015. At this time, laboratory analytical results have not been received. Based on the analytical results and observations made during the hand auger investigation and to address the impacted soil at the Site, remedial excavation activities were initiated on April 19, 2022, and completed on April 22, 2022.

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):

During excavation, operator will collect a sufficient number of excavation sidewall and base confirmation soil samples to demonstrate successful remediation. In addition, the four partially buried produced water tanks associated with the facility will be permanently removed. Operator will conduct field screening and confirmation soil sampling activities during excavation and removal of the partially buried produced water tanks in accordance with ECOM 900 Series Rules. Discrete soil samples will be collected and analyzed pursuant to Rule 915, following the general sample collection guidance in Rule 915.e.(2).

Proposed Groundwater Sampling

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

Depth to groundwater is unknown but may be encountered within 20 feet of ground surface. Up to two test pits will be excavated to a depth of approximately 12 feet bgs between the water vaults and ASTs. If groundwater is encountered within the test pits or a pathway to groundwater is observed, ground water samples will be collected in accordance with ECOM Rule 915.e.(3), and will be submitted to an accredited laboratory for analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5 TMB by EPA Method 8260.

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):

On November 9, 2023, three additional monitoring wells were installed to the southwest in the adjacent cultivated field. One soil sample was collected from each soil boring and analyzed for the full ECMC Table 915-1 list of analytes. Based on the initial laboratory data, organic parameters were all reported below their respective ECMC Table 915-1 standards. At the time of this Form 27 submittal, metals and inorganic parameters have not yet been fully reported by the laboratory and will be summarized in the next Quarterly Form 27 submittal. The organic laboratory data are summarized on Tables 1 to 2 and illustrated on Figure 5. The well boring logs and laboratory report are also attached.

Refer to the Groundwater Monitoring section of this Form 27 for additional information.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil	NA / ND
Number of soil samples collected <u>23</u>	-- Highest concentration of TPH (mg/kg) <u>1500</u>
Number of soil samples exceeding 915-1 <u>3</u>	NA Highest concentration of SAR <u> </u>
Was the areal and vertical extent of soil contamination delineated? <u>Yes</u>	BTEX > 915-1 <u>Yes</u>
Approximate areal extent (square feet) <u>3200</u>	Vertical Extent > 915-1 (in feet) <u>9</u>
Groundwater	
Number of groundwater samples collected <u>3</u>	-- Highest concentration of Benzene (µg/l) <u>1.4</u>
Was extent of groundwater contaminated delineated? <u>Yes</u>	ND Highest concentration of Toluene (µg/l) <u> </u>
Depth to groundwater (below ground surface, in feet) <u>10</u>	-- Highest concentration of Ethylbenzene (µg/l) <u>1.8</u>
Number of groundwater monitoring wells installed <u>20</u>	ND Highest concentration of Xylene (µg/l) <u> </u>
Number of groundwater samples exceeding 915-1 <u>0</u>	NA Highest concentration of Methane (mg/l) <u> </u>
Surface Water	
<u>0</u> Number of surface water samples collected	
<u> </u> 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?

Groundwater impacts extend offsite to the southwest into a cultivated field. The field is owned by the same landowner.

Were background samples collected as part of this site investigation?

One background soil sample (BG-1 1 Ft) was collected on April 19, 2022, from an area to the south of the tank battery away from potential sources of impact related to the Site operations.

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.

A total of approximately 1,010 cubic yards of hydrocarbon impacted soil, excavated from beneath the ASTs and partially buried produced water tanks, was hauled offsite for disposal under manifest to Waste Management's North Weld Landfill in Ault, Colorado. All waste generated was managed and disposed of in accordance with Rules 905 and 906. One to two feet of clean, washed pea gravel was added to the base of the excavation to facilitate future remediation if necessary.

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.

Hydrocarbon impacted soil in the vadose zone has been previously removed via excavation.

Groundwater impacts have been fully delineated. Following two additional quarters of groundwater monitoring, a remediation plan will be developed and implemented based on analytical results. At this time, benzene concentrations in groundwater appear to be trending downward indicating natural attenuation may be an effective remedial approach for this Site.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 1010

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC 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.

On November 9, 2023, three additional monitoring wells (MW-18 to MW-20) were installed in soil borings to the southwest in the adjacent cultivated field. Groundwater samples were collected and analyzed for BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, total dissolved solids (TDS), sulfate, and chloride by ECMC approved methods. Laboratory data indicate that the petroleum constituents were below their respective ECMC Table 915-1 limits in all 3 new wells, indicating that the southwestern extent of the groundwater plume has been defined. These data are summarized on Tables 3 to 4 and illustrated on Figure 4. The groundwater elevation data is shown on Figure 3 and indicates the groundwater flow direction is to the southwest. The well boring logs and laboratory report are also attached.

Groundwater monitoring will continue on a quarterly basis at the 20 monitoring wells until closure criteria are met. Groundwater samples will be submitted for laboratory analyses of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, 1-methylnaphthalene, 2-methylnaphthalene, total dissolved solids (TDS), sulfate, and chloride by ECMC approved methods.

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.

- Initial mitigation (excavation) activities have been conducted for soil.
- Source mass removal is mostly complete. Additional removal of source mass material may be needed.
- Investigation and delineation activities are complete for groundwater.
- Quarterly groundwater monitoring activities are ongoing.
- Following two additional quarters of groundwater monitoring, a remediation plan will be developed and implemented based on analytical results.

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: \$ 40000 _____

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 _____ 1010

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____

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

Volume of E&P Waste (liquid) in barrels _____ 53

E&P waste (liquid) description Produced water, oil, condensate, melted snow, roadbase

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Republic Services' Tower Landfill in Commerce City, CO

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 COGCC 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.

The Schmunk EF tank battery is an active facility and there are no current plans for decommissioning or reclamation activities. This stated, following excavation activities, the location was backfilled, compacted and re-contoured for the tank battery operations to continue.

Is the described reclamation complete? _____

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

Interim

Final

Did the Surface Owner provide the seed mix? _____

If YES, does the seed mix comply with local soil conservation district recommendations? _____

Did the local soil conservation district provide the seed mix? _____

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. _____

Proposed date of completion of Reclamation. _____

IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 02/23/2022

Actual Spill or Release date, or date of discovery. 02/23/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/24/2022

Proposed site investigation commencement. 04/05/2022

Proposed completion of site investigation. 12/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 04/12/2022

Proposed date of completion of Remediation. 04/12/2025

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:

OPERATOR COMMENT

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

Signed: Jason Davidson

Title: Senior Env. Specialist

Submit Date: _____

Email: FRspillremediationcontractor@pdce.com

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

COGCC Approved: _____

Date: _____

Remediation Project Number: 22766

COA Type

Description

0 COA	

Attachment Check List

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

Att Doc Num

Name

403603082	ANALYTICAL RESULTS
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Total Attach: 1 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)