

State of Colorado
Energy & Carbon Management Commission

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Document Number:
403864124

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>(303) 860-5800</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>Karen Olson</u>	Email: <u>taspillremediationcontractor@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 30066 Initial Form 27 Document #: 403434014

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: <u>LOCATION</u>	Facility ID: <u>425492</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Geis 11-32</u>	Latitude: <u>40.529683</u>	Longitude: <u>-104.694696</u>	
** correct Lat/Long if needed: Latitude: <u>40.528835</u>		Longitude: <u>-104.694747</u>	
QtrQtr: <u>NWSW</u>	Sec: <u>32</u>	Twp: <u>7N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-34412</u>	County Name: <u>WELD</u>
Facility Name: <u>GIES 19-32</u>	Latitude: <u>40.529644</u>	Longitude: <u>-104.694697</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>32</u>	Twp: <u>7N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: WELL Facility ID: API #: 123-34425 County Name: WELD
 Facility Name: GIES 11-32 Latitude: 40.529687 Longitude: -104.694697
 ** correct Lat/Long if needed: Latitude: Longitude:
 QtrQtr: NWSW Sec: 32 Twp: 7N Range: 65W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL Facility ID: API #: 123-34426 County Name: WELD
 Facility Name: GIES 14-32 Latitude: 40.529604 Longitude: -104.694697
 ** correct Lat/Long if needed: Latitude: Longitude:
 QtrQtr: NWSW Sec: 32 Twp: 7N Range: 65W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Agricultural
 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? Yes

Other Potential Receptors within 1/4 mile

Tank Battery: Nearest Well: Domestic - 1,739' SSE; Surface Water: Irrigation Ditch - 41' SE; Occupied Building: 674' W; Livestock: 714' SSW; FWS Wetlands: 738' E Riverine (R5UBFx).
 Wellhead (Gies 14-32): Domestic / Stock - 1,753' NNE; Surface Water: Irrigation Ditch - 310' S; Occupied Building: 674' W; Livestock: 995' SSW; FWS Wetlands: 733' E Riverine (R5UBFx).
 Wellhead (Gies 19-32): Domestic / Stock - 1,742' NNE; Surface Water: Irrigation Ditch - 325' S; Occupied Building: 675' W; Livestock: 1,010' SSW; FWS Wetlands: 732' E Riverine (R5UBFx).
 Wellhead (Gies 11-32): Domestic / Stock - 1,689' NNE; Surface Water: Irrigation Ditch - 340' S; Occupied Building: 676' W; Livestock: 1,026' SSW; FWS Wetlands: 730' E Riverine (R5UBFx).

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 Document No. 403556306	Confirmation Groundwater Sampling
Yes	SOILS	Refer to Document No. 403556306	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 August 22, 2023, field screening and confirmation soil sampling activities were conducted in accordance with the ECMC Rule 911 during the decommissioning of the Gies 11, 14, 19-32 Tank Battery, Gies 11-32 wellhead, Gies 14-32 wellhead, Gies 19-32 wellhead, and removal of the associated on-location flowlines. Based on initial analytical results from waste characterization soil sample (WC01), it was determined that a historic release was discovered below the produced water vessel (PWV). Additionally, based on initial analytical results from waste characterization soil sample (WC02), it was determined that a historic release was discovered below the separator dump-line. On August 22, 2023, mitigation activities were initiated and approximately 1.5 cubic yards of impacted material were removed from the separator dump-line location. An additional 6.5 cubic yards of impacted material were removed from the PWV01 location. In total, approximately 7.5 cubic yards of impacted material were removed from the Gies 11, 14, 19-32 Tank Battery and transported to the Buffalo Ridge Landfill for disposal under a PDC waste manifest. Additionally, groundwater vacuum recovery was conducted concurrent with excavation activities and approximately 1 barrel (BBL) of groundwater was removed and transported to NGL C6 for disposal under a PDC waste manifest.

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 August 22, 2023, two (2) waste characterization soil samples (WC01 & WC02) were collected from the PWV01 and separator dump-line source areas at approximately 4 feet below ground surface (bgs), respectively. The samples were submitted for laboratory analysis of the full ECMC Table 915-1 analytical suite. Analytical results indicated that site specific COCs for both release 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), and 2-M.

Proposed Groundwater Sampling

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

On August 22, 2023, groundwater was encountered at approximately 4 feet bgs in the PWV01, separator dump-line, and separator flowline excavations. Consequently, three (3) groundwater samples (GW01-GW03) were collected from the excavations and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB. Analytical results indicated that groundwater constituents were below of the applicable ECMC Table 915-1 Standards. The groundwater sample location map and the analytical results were included on the previously submitted Supplemental Form 27 Document No. 403556306.

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 August 22, 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 above ground storage tanks (AST), separator flowline (SEP01-FL), wellheads (WH), and wellhead flowline risers (FLR), and submitted for analysis of Table 915-1 Organic Compounds in Soil and TPH. The WH, FLR, & SEP01-FL soil samples were submitted for additional analysis of pH, EC, SAR, and boron. Analytical results indicated that the soil samples were in compliance with the applicable Table 915-1 standards, with the exception of SAR in soil sample WH02 @ 6'. Additionally, field screened grab soil samples were also collected below the emission control device (ECD), compressor (COMP), and meter-house (MH).

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 33

Number of soil samples exceeding 915-1 3

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

Approximate areal extent (square feet) 450

NA / ND

-- Highest concentration of TPH (mg/kg) 19

-- Highest concentration of SAR 6.24

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 6

Groundwater

Number of groundwater samples collected 3

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 4

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

 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 August 23, 2023, three (3) background soil borings (BKG01-BKG03) were advanced via hand auger in native material adjacent to the tank battery and wellhead locations. Six soil samples were collected from each background soil boring at approximately 1 foot, 2 ft, 3 ft, 4 ft, 5 ft, and 6 ft bgs and were submitted for laboratory analysis of ECMC Table 915-1 metals and SAR. Analytical results indicated that arsenic, barium, and selenium concentrations were in exceedance of the applicable regulatory standards in native soil.

Additionally on March 18, 2024, eight background soil samples (BKG04 & BKG05) were collected at depths ranging from approximately 5-6 feet to 9-10 feet bgs and were submitted for laboratory analysis of SAR. Soil analytical results indicated that SAR was in compliance with the applicable ECMC regulatory standards in all soil sample locations.

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

Volume of solid waste (cubic yards) 8

Volume of liquid waste (barrels) 1

Is further site investigation required?

On March 13, and March 18, 2024, 10 monitoring wells (BH01 – BH10) were installed at the former Gies 11,14, 19-32 tank battery location to confirm the absence of dissolved-phase hydrocarbon impacts within and surrounding the former excavation extents. Lithologic descriptions and VOC concentrations measured using a photoionization detector (PID) were recorded for each monitoring well.

On March 18, 2024, supplemental site investigation activities were initiated at the former Gies 9-32 wellhead location to confirm and delineate the SAR exceedance recorded during decommissioning activities. Lithologic descriptions and VOC concentrations measured using a PID were recorded for each soil boring. Five soil borings (SB01-SB05) were advanced adjacent to and surrounding the former exceedance to a depth of approximately 10 feet bgs. Six soil samples were collected from the soil borings at depths of 5-6 feet and 7-8 feet bgs and were submitted to Summit for laboratory analysis of SAR. During boring advancement, groundwater was encountered in the boreholes at approximately 7 feet bgs. Consequently, one groundwater sample was collected from the source boring (SB01) and submitted to Summit for analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB.

Soil analytical results indicated that SAR was in compliance with the applicable ECMC regulatory standards in all soil sample locations. Additionally, organic compound concentrations were in compliance with the applicable regulatory standards in groundwater sample GW01. Based on the data, the SAR exceedance recorded during decommissioning activities could not be replicated and all SAR concentrations on site are within regulatory standards. Consequently, no further delineation activities are required at this time.

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.

On August 22, 2023, approximately 7.5 cubic yards of impacted material were excavated below and adjacent to both the former PWV and separator dump-line and were transported to the Buffalo Ridge Landfill for disposal under a PDC waste manifest. Additionally, groundwater vacuum recovery was conducted concurrent with excavation activities and approximately 1 barrel (BBL) of groundwater was removed and transported to NGL C6 for disposal under a PDC waste manifest.

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 August 22 & 23, 2023, ten (10) soil samples (PWV01-B, PWV01-B2, PWV01-N, PWV01-E, PWV01-S, PWV01-W, & S01-S04) were collected from the sidewalls and base of the PWV excavation at depths ranging from 3 to 5 feet bgs and were submitted for laboratory analysis of 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), and 2-M. Additionally, soil sample S05 was 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 applicable ECMC Table 915-1 standards in all samples collected from the final excavation extent.

On August 22 & 23, 2023, nine (9) soil samples (SS01-SS05 & SS07-SS10) were collected from the sidewalls and base of the separator dump-line excavation at depths ranging from 3 to 4 feet bgs and were submitted for laboratory analysis of the above mentioned COCs. Additionally, soil samples SS06 was 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 applicable ECMC Table 915-1 standards in all samples collected from the final excavation extent.

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

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 8

_____ 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

Yes _____ 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 10 site monitoring wells (BH01 - BH10) until closure criteria are met. Groundwater samples will be submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260B, chloride and sulfate anions by EPA Method 300.0 and total dissolved solids (TDS) by Method SM 2540C in accordance with Table 915-1.

Second quarter 2024 analytical results indicated that organic compound concentrations were in compliance with the applicable ECMC Table 915-1 regulatory standards in all 10 monitoring well locations. Additionally, TDS, chloride, and sulfate anion concentrations were in compliance with the applicable standards or within 1.25x the historic maximum background concentrations recorded in the up-/cross-gradient monitoring wells (BH03, BH06-BH08, and BH10) in all monitoring well locations. Based on groundwater flow direction, monitoring well BH03 was not used as a background location during the second quarter 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.

Financial assurance information was included in the first quarter 2024 Supplemental Form 27 (Document No. Document No. 403662834). 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: \$ 30000

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 _____ 8

E&P waste (solid) description Hydrocarbon impacted soils

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC Disposal Facility: Buffalo Ridge Landfill

Volume of E&P Waste (liquid) in barrels _____ 1

E&P waste (liquid) description Hydrocarbon impacted groundwater

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC Disposal Facility: NGL C6

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, wellhead, and associated flowline decommissioning 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. 08/22/2023

Proposed date of completion of Reclamation. 08/23/2028

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. 05/22/2023

Actual Spill or Release date, or date of discovery. 08/23/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/05/2023

Proposed site investigation commencement. 03/13/2024

Proposed completion of site investigation. 03/18/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/22/2023

Proposed date of completion of Remediation. 08/23/2028

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:

Based on the results of the March 2024 supplemental site investigation activities, no further investigations are required at this time.

OPERATOR COMMENT

This Supplemental Form 27 was submitted to summarize quarterly groundwater monitoring activities and analytical results collected during the second quarter 2024 at the former Gies 11, 14, 19-32 Tank Battery location.

Second quarter 2024 analytical results indicated that organic compound concentrations and chloride anions were in compliance with the applicable ECMC Table 915-1 regulatory standards in all 10 monitoring well locations for the second consecutive quarter. Additionally, TDS and sulfate anion concentrations were in compliance with the applicable standards or within 1.25x the historic maximum background concentrations in all monitoring well locations.

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

Signed: Karen Olson

Title: Remediation Advisor

Submit Date: _____

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: _____

Date: _____

Remediation Project Number: 30066

COA Type

Description

0 COA	

ATTACHMENT LIST

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

Att Doc Num

Name

403866730	MONITORING REPORT
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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)