

State of Colorado Oil and Gas Conservation Commission

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Document Number:

403136240

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 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>1775 SHERMAN STREET - STE 3000</u>		Phone: <u>(303) 580-8600</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80203</u>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSpillremediation@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 20596 Initial Form 27 Document #: 402850672

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>WELL</u>	Facility ID: _____	API #: <u>123-20757</u>	County Name: <u>WELD</u>
Facility Name: <u>WITWER 44-6D</u>		Latitude: <u>40.424940</u>	Longitude: <u>-104.587170</u>
		** correct Lat/Long if needed: Latitude: <u>40.424939</u>	Longitude: <u>-104.587203</u>
QtrQtr: <u>NESE</u>	Sec: <u>6</u>	Twp: <u>5N</u>	Range: <u>64W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>
Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-20756</u>	County Name: <u>WELD</u>
Facility Name: <u>WITWER 34-6D</u>		Latitude: <u>40.424970</u>	Longitude: <u>-104.587280</u>
		** correct Lat/Long if needed: Latitude: <u>40.424961</u>	Longitude: <u>-104.587306</u>
QtrQtr: <u>NESE</u>	Sec: <u>6</u>	Twp: <u>5N</u>	Range: <u>64W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

Facility Type: LOCATION	Facility ID: 333244	API #:	County Name: WELD
Facility Name: WITWER-65N64W 6NESE	Latitude: 40.424940	Longitude: -104.587170	
** correct Lat/Long if needed: Latitude: 40.424642		Longitude: -104.587303	
QtrQtr: NESE	Sec: 6	Twp: 5N	Range: 64W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM	Most Sensitive Adjacent Land Use Riparian / Agriculture
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

Tank Battery: Nearest Well: Monitoring / Irrigation - 841 feet SE / 1,231 feet NE, Surface Water: South Platte River - 300 feet SW, Occupied Buildings: 1,111 feet NW, Livestock: 1,012 feet NW, FWS Wetlands: Forested/Shrub Riparian (Rp1FO) - 121 feet S, HPH: Located within Bald Eagle Active Nest Site 1/2-mile bound, Mule Deer Severe Winter Range, Aquatic Native Species Conservation Waters, and 100-yr floodplain - 0 feet

Wellheads (34-6D / 44-6D): Nearest Well: Irrigation - 1,125 feet NE / 1,128 feet NE, Surface Water: South Platte River - 400 feet SW (both), Occupied Buildings: 997 feet NW / 1,014 feet NW, Livestock: 902 feet NW / 918 feet NW, FWS Wetlands: Herbaceous Riparian (Rp1EM) - 198 feet SE / 177 feet SE, HPH: Located within Bald Eagle Active Nest Site 1/2-mile bound, Mule Deer Severe Winter Range, and Aquatic Native Species Conservation Waters - 0 feet

Flowline conflict likely as wellheads and flowlines are located within HPH as listed above, <100 feet from 100-yr 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	SOILS	See Tables 1-5 and Figures 1-3	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.

In accordance with COGCC Rule 911, this form serves as notification for the decommissioning and abandonment of the Witwer 34, 44-6D, 43-6 production facility, Witwer 34-D and 44-6D wellheads, and removal of the associated flowlines. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning. Field observations and photo documentation will be recorded in a field inspection form for submittal to the COGCC.

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):

Grab soil samples will be collected below and/or adjacent to applicable facility equipment, as defined in the Rule 911.a.(4) guidance document (9/20/21), for field screening purposes. Discrete soil samples will be collected for laboratory analysis either in any area of observed hydrocarbon impacts, or in the sample locations designated by the COGCC. GPS data will be collected for all soil sample locations. Soil samples collected at the tank battery will be submitted for laboratory for analysis of BTEX, naphthalene, TPH (C6-C36), 1,2,4-TMB, and 1,3,5-TMB by EPA Methods 8260B and 8015. Additionally, soil sample(s) will be collected in the area most likely to be impacted by produced water and will be submitted for laboratory analysis of EC, pH, SAR, and boron by saturated paste and hot water soluble extraction methods. Soil samples will be collected adjacent to the wellhead from native material and submitted for laboratory analysis of Organic Compounds in Soil and soil suitability.

Proposed Groundwater Sampling

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

If groundwater is encountered during decommissioning and/or abandonment activities, a grab sample will be collected as soon as practical. If contaminated soil is in contact with groundwater or if free product/hydrocarbon sheen are observed, the release will be reported in accordance with Rule 912.b. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene 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):

If a produced water vessel is present, discrete soil samples will be collected from the base of the excavation and sidewall in areas most likely to be impacted and exhibiting the highest field screened VOC concentration. The soil samples will be submitted for additional laboratory analysis of EC, pH, SAR, and boron by saturated paste and hot water soluble extraction methods. Assessments will be conducted during the removal of these on-location flowlines (estimated to be 80 ft and 110 ft in length) and soil samples will be collected at the flowline endcaps. The flowlines and adjacent sub-surface will be inspected for any visual and olfactory indicators of potential failure and hydrocarbon impacts. Soils will be field screened below the flowline and if suspected impacts are observed, a soil sample will be collected for an initial assessment. Samples will be submitted for laboratory analysis of Organic Compounds in Soil and TPH (C6-C36). GPS data and photo documentation will be recorded.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 30
Number of soil samples exceeding 915-1 9
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 200

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 9.86
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 6

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 _____
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 November 17, 2021, five background soil samples (BKG01) were collected at between 6 inches & 6 feet bgs from native material topographically up-gradient of the tank battery and were submitted for analysis of the COGCC Table 915-1 metals, pH, and SAR. Analytical results indicated that arsenic, barium, and selenium were in exceedance of the applicable regulatory standards in native soil.

Additionally, on August 2, 2022, twenty (20) background soil samples (BKG02-BKG05) were collected between 2.5 feet & 8 feet bgs from native material adjacent to the tank battery. All background soil samples were submitted for analysis of the Table 915-1 metals. Analytical results indicated that arsenic, barium, and selenium were in exceedance of the applicable regulatory standards in native soil. Based on these results, the arsenic, barium, and selenium exceedances observed in thirteen of the fifteen soil samples collected from the final excavation extents are indicative of native soil conditions.

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

Volume of solid waste (cubic yards) 12 Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

Five (5) additional soil borings will be advanced via hand auger drilling methods to delineate the horizontal and vertical extents of the selenium exceedance observed in excavation soil sample AST03-B @ 4'. 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 each soil boring at 4 feet, 6 feet, and 8 feet bgs and submitted for laboratory analysis of selenium.

Additionally, four (4) soil borings will be advanced via hand auger drilling methods to delineate the horizontal and vertical extents of the arsenic exceedance observed in excavation soil sample AST02-N @ 2.5'. Soil samples will be collected from each soil boring at 2.5 feet, 4 feet, 6 feet, and 8 feet bgs and submitted for laboratory analysis of arsenic. The proposed soil boring locations are illustrated on figure 3. Confirmation sampling will be completed by the end of the first quarter 2023.

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.

Soil encountered on site and below production equipment was visually inspected and field screened for VOC concentrations using a PID. Per the approved proposed soil sampling plan, samples were collected below and/or adjacent to the SEP-FL, SEP-DL and PWV. The samples were submitted for laboratory analysis of BTEXN, TMBs, and TPH. The excavation base sample and sidewall sample which exhibited the highest PID reading collected adjacent to the produced water vessel were submitted for additional laboratory analysis of pH, EC, SAR, and boron. Laboratory analysis indicated analyzed constituents were below the applicable COGCC Table 915-1 standards.

Additionally, during decommissioning activities, 4 cubic yards (CY) of material were removed from beneath each of the 3 ASTs (AST01, AST02, and AST03). The 12 total CY of material were transported to North Weld Waste Management facility for disposal under PDC waste manifests. The excavation base sample and sidewall sample which exhibited the highest PID reading collected adjacent to each AST were submitted for laboratory analysis of the full table 915-1 analytical suite. Analytical results indicated organic constituents were below applicable Table 915-1 standards; however, arsenic, barium and selenium exceedances were observed. Subsequently, the remaining three (3) sidewall samples for each of the 3 ASTs were submitted for laboratory analysis of arsenic, barium, and selenium. Analytical results indicated arsenic and selenium constituents were observed in exceedance of applicable Table 915-1 standards. Additionally, three background samples (BKG01) were collected at approximately 6 inches, 2.5 feet, and 4 feet bgs from native material up-gradient of the tank battery and submitted for analysis of Table 915-1 metals. Analytical results indicated that arsenic, barium and selenium were in exceedance of the applicable regulatory standards in native soil.

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.

Based upon the COA issued by the COGCC (Document # 402927492) on March 22, 2022, a supplemental site investigation was conducted on June 2, 2022, at the former Witwer 44-6D wellhead and Witwer 34, 44-6D tank battery location.

Five soil borings (SB01-SB05) were advanced via hand auger adjacent to and surrounding the former wellhead excavation to confirm and delineate the vertical and horizontal extents of the pH and SAR exceedances observed in soil samples WH01. Six soil samples were collected from soil boring SB01 between 2.5 and 8 feet bgs, from soil adjacent to WH01. All six soil samples (SB01) were submitted for laboratory analysis of pH, electrical conductivity (EC), sodium adsorption ratio (SAR), and boron. Additionally, one soil sample was collected from each of the surrounding soil borings SB02-SB05 at 6 feet bgs and submitted for laboratory analysis of pH, EC, SAR and boron. Analytical results indicated that pH, EC, SAR and boron levels were in compliance with the applicable COGCC Table 915 Soil Suitability for Reclamation standards for all soil samples collected.

Additionally, twenty background soil samples (BKG02-BKG06) were advanced via hand auger adjacent to the former tank battery in native material. Background soil samples were collected between 2.5 feet and 8 feet bgs, and submitted for analysis of Table 915-1 metals, pH, EC, SAR and boron. Analytical results indicated that pH, EC, SAR, and boron are in compliance with the Table 915 Soil Suitability for Reclamation standards in native soils. Analytical results indicated that arsenic, barium, and selenium were in exceedance of the applicable regulatory standards in native soil. Based on these results, the arsenic, barium, and selenium exceedances observed in thirteen of the fifteen soil samples collected from the final excavation extents are indicative of native soil conditions.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____ 12

_____ 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.

Groundwater was not encountered during initial decommissioning activities.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

☐ Quarterly☐ Semi-Annually☐ Annually☒ Other

Confirmation Sampling Summary and Supplemental Site Investigation Proposal

☐ 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 Confirmation Sampling Summary and Supplemental Site Investigation Proposal

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 COGCC 1000 Series.
- Further soil investigation is required for Table 915-1 metals at the former tank battery.

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? 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 12

E&P waste (solid) description Impacted soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: North Weld Waste Management

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC 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? _____

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.

Following wellhead and flowline removal activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The location will be reclaimed in accordance with COGCC 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. 11/17/2021

Proposed date of completion of Reclamation. 08/15/2027

IMPLEMENTATION SCHEDULE

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

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 02/10/2021

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 11/17/2021

Proposed site investigation commencement. 01/01/2023

Proposed completion of site investigation. 03/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/17/2021

Proposed date of completion of Remediation. 08/15/2027

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

Analytical results for the Witwer 44-6D wellhead soil samples collected during the supplemental site investigation conducted on August 2, 2022, from soil borings SB01 through SB05, indicated that pH, EC, SAR, and boron concentrations were in compliance with the COGCC Table 915-1 Soil Suitability for Reclamation standards in all soil samples. Based on the results, the initial pH and SAR exceedances recorded during initial decommissioning activities was a discrete location and native soil below and adjacent to the former wellhead location was in compliance with the Soil Suitability for Reclamation standards.

Based on the results described herein for the Witwer 34, 44-6D tank battery, PDC will conduct a supplemental site investigation to delineate the vertical and horizontal extents of the COGCC Table 915-1 metals exceedances observed in soil samples AST03-B @ 4' (barium) and AST02-N @ 2.5' (arsenic). Pending the approval of this form, the site investigation will be conducted by the end of the first quarter 2023.

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: _____

Email: COGCCSpillremediation@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: 20596

COA Type

Description

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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

403136421	LOGS
403136423	LOGS
403136424	SOIL SAMPLE LOCATION MAP
403152240	ANALYTICAL RESULTS
403152242	ANALYTICAL RESULTS

Total Attach: 5 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)