

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

403618989

Receive Date:

12/08/2023

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 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: CHACO ENERGY COMPANY	Operator No: 10017	Phone Numbers Phone: (303) 981-3840 Mobile: (303) 981-3840
Address: P O BOX 1587		
City: DENVER	State: CO Zip: 80201	
Contact Person: Matt Nelson	Email: matt@chacoenergy.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 31160 Initial Form 27 Document #: 403501857

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: OFF-LOCATION FLOWLINE	Facility ID: 473994	API #: _____	County Name: LOGAN
Facility Name: Production Line 3L7NE	Latitude: 40.699234	Longitude: -103.394543	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NENE	Sec: 3	Twp: 8N	Range: 54W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use Cropland

Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

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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	750 sq ft	Laboratory Analysis

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 Form 27-Initial (#403501857) was approved on 8/25/2023, and site investigation activities were performed between 06/30/2023 and 11/07/2023. Based on the conditions of approval (COA) and discussions with ECMC personnel, eAnalytics Laboratory was not accredited by a national laboratory accreditation program such as NELAP or NELAC at the time of the initial investigation events on 6/30/2023 and 8/2/2023. Therefore, analytical data from eAnalytics which included the Table 915-1 organics, chromium, EC, and pH analytes are not recognized for site closure. Data that was analyzed by eAnalytics is noted with an Asterisk (*) on the attached analytical summary tables. Other data were analyzed by Elevations Diagnostics and Summit Scientific which are both NELAP accredited laboratories. Impacted soil excavation activities were performed in August and October of 2023. The analytical data from the 10/5/2023 sampling event demonstrated that excavation activities successfully remediated the organic and PAH impacts that were previously above Table 915-1 protection of groundwater standards. Additional excavation activities were performed in October 2023 to remediate SAR from the west base of the excavation, boron from the north and south walls, and lead from the east wall and base of the excavation. Arsenic, barium, cadmium, and pH were also above the Table 915-1 protection of groundwater standards from the October 5th sampling event. However, from the 11/7/2023 sampling event, all four background samples were above the standards for pH and arsenic and two of the four background samples were above for barium and cadmium. Additionally, During the 10/5/2023 sampling event, both base samples that were collected were non-detect for boron, but the base samples that were collected at a greater depth during the 11/7/2023 sampling event were above the standards indicating that boron concentrations are not related to the produced water spill and are naturally occurring concentrations.

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):

Analytical data collected from the background samples and the extents of the excavation indicate that excavation remediation activities were successful in removing petroleum hydrocarbon impacts and other E&P waste impacts that occurred from the May 22, 2023, produced water line leak. Additionally, the nearest registered groundwater wells indicate static groundwater depths between 276 and 345 feet below ground surface, and together with the analytical data from the base of the excavation, this demonstrates that a pathway to groundwater does not exist. Therefore, the analytical data are compared to the Table 915-1 residential soil screening level concentrations. The remaining concentrations of pH, arsenic, and boron are related to background conditions. Because the analytical data for organics and PAH constituents were non-detect during the 10/5/2023 sampling event, those constituents were not analyzed during the 11/7/2023 sampling event.

Proposed Groundwater Sampling

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

Groundwater was not encountered during excavation or sampling activities. The nearest registered groundwater wells indicate static groundwater depths between 276 and 345 feet below ground surface. Based on the groundwater well and excavation sample analytical data, a pathway to groundwater does not exist.

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 28

Number of soil samples exceeding 915-1 7

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 750

NA / ND

-- Highest concentration of TPH (mg/kg) 1177.8

-- Highest concentration of SAR 22.285

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 4

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?

A total of 6 background samples were collected at the locations and depths illustrated on the attached site figures and summarized on the analytical summary tables. Background analytical data indicate concentrations above the Table 915-1 concentrations for pH and arsenic. Additionally, soil sample locations and depths from the excavation when compared to shallower non-detect concentrations below the pipeline indicate that remaining boron concentrations are related to background conditions and not related to the produced water line leak. Additionally, the depths of the boron data are below the local vegetative root zone.

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

Volume of solid waste (cubic yards) 314

Volume of liquid waste (barrels) 0

☐ 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.

Excavation remediation activities removed 423.29 tons (approximately 314 cubic yards) of E&P waste impacted soil which was transported to the Pawnee Waste landfill for disposal. The waste manifests for soil disposal are included as an attachment.

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.

Excavation remediation activities removed 423.29 tons (approximately 314 cubic yards) of E&P waste impacted soil which was transported to the Pawnee Waste landfill for disposal. The waste manifests for soil disposal are included as an attachment.

Soil Remediation Summary

☐ In Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

☒ Ex Situ

Yes _____ Excavate and offsite disposal

_____ If Yes: Estimated Volume (Cubic Yards) _____ 314

_____ Name of Licensed Disposal Facility or COGCC 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.

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 Remediation Summary and Closure Request

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.

COI Insurance info. Operator has appropriate insurance coverage per Rule 705. Document #403115230.

Operator anticipates the remaining cost for this project to be: \$ 7500

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:

Excavation remediation activities removed 423.29 tons (approximately 314 cubic yards) of E&P waste impacted soil which was transported to the Pawnee Waste landfill for disposal. The waste manifests for soil disposal are included as an attachment.

Volume of E&P Waste (solid) in cubic yards 314

E&P waste (solid) description E&P waste impacted soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Pawnee Waste Landfill

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? Yes

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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

Does Groundwater meet Table 915-1 standards? Yes

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.

Structural fill and topsoil were transported to the site for backfilling activities. Because the produced water line was exposed to atmosphere, the excavation and pipeline were backfilled subsequent to receiving the 11/7/2023 analytical data and prior to receiving approval for remediation closure to prevent the water line from freezing and rupturing due to inclement weather forecast and freezing temperatures. If the remediation project closure request is approved, reclamation activities will be performed in the Spring of 2024 by April 15, 2024. Re-seeding will be performed using seed mix from the Buffalo Brand Seed Company located in Greeley, CO. Approximately 0.2 acres of disturbed land will be seeded at 20 seeds/ft² at a depth of ¼" deep, spaced 7-10" using standard drill seeding methods. Straw mulch will be placed over top of the reseeded area at a rate of approximately 2 tons per acre, or 0.1 ton for the site, and crimped to the surface using standard crimping methods. Straw wattles will be utilized for stormwater erosion best management practices (BMPs) until the site has reached 80% of native vegetation density when compared to the surrounding area. Wattles will be placed through the revegetation area at approximately 50-foot centers and on the downgradient side of the reclamation area. The wattle barriers will extend beyond the reseeded area by a distance of at least 10-feet on either side and secured using lath stakes placed in the ground on the downgradient side and at 10-foot spacing. Because this is an operating facility, monitoring for vegetation growth and weed management will be conducted regularly.

Is the described reclamation complete? No

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? No

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

Did the local soil conservation district provide the seed mix? No

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 04/01/2024

Proposed date of completion of Reclamation. 04/01/2025

IMPLEMENTATION SCHEDULE

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

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 05/23/2023

Actual Spill or Release date, or date of discovery. 05/22/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/30/2023

Proposed site investigation commencement. 06/30/2023

Proposed completion of site investigation. 11/07/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/01/2023

Proposed date of completion of Remediation. 10/31/2023

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

Impacted soil excavation activities were performed in August and October of 2023 and removed 423.29 tons (314 CY) of E&P waste impacted soil which was transported to Pawnee Waste landfill for disposal. The manifests for soil disposal are included as an attachment. The analytical data from the 10/5/2023 sampling event demonstrated that excavation activities successfully remediated the organic impacts that were previously above Table 915-1 protection of groundwater standards. Additional excavation activities were performed in October 2023 to remediate SAR from the west base of the excavation, boron from the north and south walls, and lead from the east wall and base. Arsenic, barium, cadmium, and pH were also above the Table 915-1 protection of groundwater standards from the October 5th sampling event. However, from the 11/7/2023 sampling event, all four background samples were above the standards for pH and arsenic and two of the four background samples were above for barium and cadmium. Additionally, During the 10/5/2023 sampling event, both base samples that were collected were non-detect for boron, but the base samples that were collected at a greater depth during the 11/7/2023 sampling event were above the standards indicating that boron concentrations are not related to the produced water spill and are naturally occurring concentrations. Groundwater was not encountered during excavation or sampling activities. The nearest registered groundwater wells indicate static groundwater depths between 276 and 345 feet below ground surface. Based on the groundwater well and excavation sample analytical data, a pathway to groundwater does not exist. Therefore, the analytical data are compared to the Table 915-1 residential soil screening level concentrations. The remaining concentrations of pH, arsenic, and boron from the 11/7/2023 sampling event are related to background conditions. Because the analytical data for organics and PAH constituents were non-detect during the 10/5/2023 sampling event, those constituents were not analyzed during the 11/7/2023 sampling event. Based on the analytical data presented, excavation remediation activities were successful in mitigating E&P waste impacts caused by the May 22, 2023, produced water line leak. Therefore, Chaco Energy Company is requesting closure of the remediation project. Structural fill and topsoil were transported to the site for backfilling activities. Because the produced water line was exposed to atmosphere, the excavation and pipeline were backfilled subsequent to receiving the 11/7/2023 analytical data and prior to receiving approval for remediation closure to prevent the water line from freezing and rupturing due to inclement weather forecast and freezing temperatures. If the remediation project closure request is approved, reclamation activities will be performed in the Spring of 2024 by April 15, 2024. Re-seeding will be performed using seed mix from the Buffalo Brand Seed Company located in Greeley, CO. Approximately 0.2 acres of disturbed land will be seeded at 20 seeds/ft² at a depth of ¼" deep, spaced 7-10" using standard drill seeding methods. Straw mulch will be placed over top of the reseeded area at a rate of approximately 2 tons per acre, or 0.1 ton for the site, and crimped to the surface using standard crimping methods. Straw waddles will be utilized for stormwater erosion best management practices (BMPs) until the site has reached 80% of native vegetation density when compared to the surrounding area. Waddles will be placed through the revegetation area at approximately 50-foot centers and on the downgradient side of the reclamation area. The waddle barriers will extend beyond the reseeded area by a distance of at least 10-feet on either side and secured using lath stakes placed in the ground on the downgradient side and at 10-foot spacing. Because this is an operating facility, monitoring for vegetation growth and weed management will be conducted regularly.

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

Signed: Matt Nelson

Title: Sr. Operations Engineer

Submit Date: 12/08/2023

Email: matt@chacoenergy.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: Krystal Heibel

Date: 02/27/2024

Remediation Project Number: 31160

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

403618989	FORM 27-SUPPLEMENTAL-SUBMITTED
403619039	ANALYTICAL RESULTS
403619049	SOIL SAMPLE LOCATION MAP
403619063	DISPOSAL MANIFESTS
403619083	ANALYTICAL RESULTS
403619084	ANALYTICAL RESULTS
403619087	ANALYTICAL RESULTS

Total Attach: 7 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Based on the information presented, it appears that no further action is necessary at this time and the ECMC approves the closure request. However, if future conditions at the site indicate contaminant concentrations in soils exceeding ECMC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required.	02/27/2024
Environmental	ECMC approves Operator's request for use of Residential SSLs based on the depth to groundwater and the local lithology suggesting a pathway to groundwater at this location is not likely.	02/27/2024

Total: 2 comment(s)