

State of Colorado
Energy & Carbon Management Commission

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Report taken by:
Krystal Heibel

Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by 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>CHACO ENERGY COMPANY</u>	Operator No: <u>10017</u>	Phone Numbers Phone: <u>(303) 981-3840</u> Mobile: <u>()</u>
Address: <u>P O BOX 1587</u>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80201</u>
Contact Person: <u>Matt Nelson</u>	Email: <u>matt@chacoenergy.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 24530 Initial Form 27 Document #: 403134907

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>PIT</u>	Facility ID: <u>117932</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>KINDT 1</u>	Latitude: <u>40.593338</u>	Longitude: <u>-103.726530</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NENW</u>	Sec: <u>11</u>	Twp: <u>7N</u>	Range: <u>57W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-15182</u>	County Name: <u>WELD</u>
Facility Name: <u>WELD COUNTY-KINDT 1</u>	Latitude: <u>40.593780</u>	Longitude: <u>-103.726960</u>	
** correct Lat/Long if needed: Latitude: <u>40.593780</u>		Longitude: <u>-103.726960</u>	
QtrQtr: <u>NENW</u>	Sec: <u>11</u>	Twp: <u>7N</u>	Range: <u>57W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications OH

Most Sensitive Adjacent Land Use Non-irrigated
Cropland;
agricultural

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

Mule Deer Severe Winter Range
Mule Deer Winter Concentration Area
Pronghorn Winter Concentration Area
Groundwater is anticipated to be greater than 75 feet bgs

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	Produced Water Pit	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.

This form has been prepared in accordance with Rule 911.a. to provide the results of the Site Closure investigation activities described in Form 27 Supplemental Document No. 403401805 that was approved on May 23, 2023. Due to inclement weather through July 2023, the site was inaccessible for heavy equipment due to impassable access road conditions. Therefore, Site decommissioning was unable to be performed until August 2023. Subsequent to Site decommissioning, investigation activities were performed on August 31, 2023 using hand augur drilling and soil sampling methods at the well head, separator, tank, and produced water pit. Soil samples were field screened at 1-foot intervals using a photoionization detector (PID) instrument. Hand augur drilling was completed between one (1) and three (3) feet below ground surface (bgs) and the interval with the highest PID reading was submitted for laboratory analysis of the Table 915-1 list of analytes. However, if the highest PID reading was observed at 3 feet bgs, the borehole was advanced until a lower PID reading was observed to verify the vertical extent of impacts. The 3-foot interval had the highest PID reading at the tank, separator, and southern berm for the produced water pit but the 4-foot sample intervals at each location returned a lower PID reading. Therefore the 3-foot sample was submitted for analysis at those locations. The laboratory analytical results are summarized on the attached analytical summary tables, illustrated on the attached site figures, and the laboratory analytical report is included as an attachment for reference. Based on anticipated groundwater elevations greater than 75 feet bgs in this area, comparison of laboratory analytical results to the Residential Soil Screening Level Concentrations is being requested.

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 were collected at the well head, separator, tank, and produced water pit using hand augur drilling and soil sampling methods. Soil sample locations are illustrated on the attached site figures and the laboratory analytical results are summarized in the attached summary tables and laboratory analytical report.

Proposed Groundwater Sampling

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

Groundwater was not encountered during site investigation activities and based on the nearest registered water wells, is anticipated to be greater than 75 feet below ground surface in this area.

Proposed Surface Water Sampling

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

Surface water is not present.

Additional Investigative Actions

Additional alternative investigative actions described in attached Site Investigation Plan (summary):

Additional investigation actions including delineation of the vertical extent of pH and boron concentrations within the center of the produced water pit is required.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 11
Number of soil samples exceeding 915-1 3
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 0

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 10.1
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 3

Groundwater

Number of groundwater samples collected 0
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) _____
Number of groundwater monitoring wells installed _____
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?

Three background samples (BKG01@2', BKG 02@2', and BKG03@2') were collected from the locations illustrated on the attached site figures. All three background samples that were collected offsite were above the Table 915-1 residential soil screening level concentrations for arsenic. Additionally, the background sample collected to the south of the location (BKG03@2') was above the Table 915-1 protection of groundwater soil screening level concentration for electrical conductivity. The analytical results observed at these locations are attributable to localized background conditions and are not related to E&P waste impacts.

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?

Further site investigation is required to delineate the vertical extents of elevated pH and boron concentrations within the center of the produced water pit. Because SAR and boron were only slightly above the standards at the northern berm of the produced water pit with detected concentrations of 10.1 and 3.26, respectively, Chaco Energy proposes to blend the northern berm material with the south, east, and west berm material that were below the Table 915-1 standards. The berm material will then be used as backfill for the produced water pit subsequent to supplemental vertical delineation activities within the center of the produced water pit and any remediation activities that may be required. Additionally, because pH and boron were very slightly above the standards with detected concentrations of 8.58 and 3.53, respectively, at the former separator location but all other constituents of concern were non-detect or below regulatory standards, Chaco Energy Company does not believe those exceedances are related to E&P waste impacts or are a threat to successful reclamation of the site. Topsoil will be utilized across the site to promote vegetation propagation and the area will be ripped prior to and subsequent to topsoil placement.

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.

Further site investigation is required to delineate the vertical extents of elevated pH and boron concentrations within the center of the produced water pit. Because SAR and boron were only slightly above the standards at the northern berm of the produced water pit with detected concentrations of 10.1 and 3.26, respectively, Chaco Energy proposes to blend the northern berm material with the south, east, and west berm material that were below the Table 915-1 standards. The berm material will then be used as backfill for the produced water pit subsequent to supplemental vertical delineation activities within the center of the produced water pit and any remediation activities that may be required. Additionally, because pH and boron were very slightly above the standards with detected concentrations of 8.58 and 3.53, respectively, at the former separator location but all other constituents of concern were non-detect or below regulatory standards, Chaco Energy Company does not believe those exceedances are related to E&P waste impacts or are a threat to successful reclamation of the site. Topsoil will be utilized across the site to promote vegetation propagation and the area will be ripped prior to and subsequent to topsoil placement.

REMEDICATION 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.

Further site investigation is required to delineate the vertical extents of elevated pH and boron concentrations within the center of the produced water pit. Because SAR and boron were only slightly above the standards at the northern berm of the produced water pit with detected concentrations of 10.1 and 3.26, respectively, Chaco Energy proposes to blend the northern berm material with the south, east, and west berm material that were below the Table 915-1 standards. The berm material will then be used as backfill for the produced water pit subsequent to supplemental vertical delineation activities within the center of the produced water pit and any remediation activities that may be required. Additionally, because pH and boron were very slightly above the standards with detected concentrations of 8.58 and 3.53, respectively, at the former separator location but all other constituents of concern were non-detect or below regulatory standards, Chaco Energy Company does not believe those exceedances are related to E&P waste impacts or are a threat to successful reclamation of the site. Topsoil will be utilized across the site to promote vegetation propagation and the area will be ripped prior to and subsequent to topsoil placement.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____

_____ 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.

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.

Reclamation will be completed in accordance with COGCC 1000 Series Rules and a reclamation plan will be proposed in a Form 27-Supplemental report subsequent to additional investigation activities.

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? _____

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. 04/15/2024

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. 08/22/2022

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

SITE INVESTIGATION DATES

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

Proposed site investigation commencement. 08/31/2023

Proposed completion of site investigation. _____

REMEDIAL ACTION DATES

Proposed start date of Remediation. _____

Proposed date of completion of Remediation. _____

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

Decommissioning activities of the tank battery infrastructure at the site was performed in August 2023 and site investigation was performed on August 31, 2023 using hand augur drilling, soil sampling, and field screening activities using a PID instrument. Samples were collected at the former well head, separator, tank, and produced water pit locations as illustrated on the attached site figures. Based on anticipated groundwater elevations greater than 75 feet bgs in this area, comparison of laboratory analytical results to the Residential Soil Screening Level Concentrations is being requested. Laboratory analytical results indicate E&P waste impacts above the Table 915-1 residential soil screening level concentrations for SAR, pH, and boron at the locations indicated in the attached analytical report, summary tables, and site figures. Exceedances for arsenic and electrical conductivity were observed within background and are anticipated to be indicative of localized conditions, not associated with E&P waste impacts. Further site investigation is required to delineate the vertical extents of elevated pH and boron within the center of the produced water pit. Because SAR and boron were only slightly above the standards at the northern berm of the produced water pit with detected concentrations of 10.1 and 3.26, respectively, Chaco Energy proposes to blend the northern berm material with the south, east, and west berm material that were below the Table 915-1 standards. The berm material will then be used as backfill for the produced water pit subsequent to supplemental vertical delineation activities within the center of the produced water pit and any remediation activities that may be required. Should remediation of impacted soil within the produced water pit be required, those activities will be proposed for approval in a Form 27-Supplemental report. Additionally, because pH and boron were very slightly above the standards with detected concentrations of 8.58 and 3.53, respectively, at the former separator location but all other constituents of concern were non-detect or below regulatory standards, Chaco Energy Company does not believe those exceedances are related to E&P waste impacts or are a threat to successful reclamation of the site. Topsoil will be utilized across the site to promote vegetation propagation and the area will be ripped prior to and subsequent to topsoil placement.

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: 11/16/2023

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: 01/16/2024

Remediation Project Number: 24530

COA Type

Description

	<p>Background sample "BKB 03 @ 2" documents an EC exceedance that is inconsistent with other site-specific background samples. Operator shall provide additional evidence that this background sample represents site-specific conditions and not an exceedance from E&P activities; otherwise, operator shall remediate this exceedance.</p> <p>Background sampling locations should be sufficiently away from the impacted area to reflect conditions not impacted by oil and gas activity, and should be obtained from similar depths and soil horizons or lithologic materials for comparison to confirmation soil samples.</p>
	<p>It appears there are various confirmation soil samples (and Background sample: BKB 03 @ 2') that have Table 915-1 Soil Suitability for Reclamation exceedances. If a spill/release of produced fluids or E&P waste causes an impact to soil, the operator should perform sampling and analysis to fully delineate the lateral and vertical extent of those impacts.</p>
	<p>ECMC denies Chaco Energy's proposed remediation plan. If a spill/release of produced fluids or E&P waste causes an impact to soil, the operator should perform sampling and analysis to fully delineate the lateral and vertical extent of those impacts.</p> <p>"Because SAR and boron were only slightly above the standards at the northern berm of the produced water pit with detected concentrations of 10.1 and 3.26, respectively, Chaco Energy proposes to blend the northern berm material with the south, east, and west berm material that were below the Table 915-1 standards."</p>
	<p>Operator shall conduct a closure investigation in accordance with Rule 911.c. Pit Closure Guidance Document.</p>
	<p>Operators will collect and submit for laboratory analysis a soil sample collected from the areas most likely to have been impacted during the operational life of the flowline. These areas include, but are not limited to: where Flowlines connect to the wellhead, surface equipment, risers, valves, or manifolds; where Flowlines bend or were repaired in the past and at joints and hammer unions; where Flowlines connect to Flowlines or equipment of different material; and where Flowlines crossed drainages or surface water or are in contact with shallow groundwater.</p>

5 COAs

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.

<u>Att Doc Num</u>	<u>Name</u>
403533126	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403533631	ANALYTICAL RESULTS
403597250	ANALYTICAL RESULTS
403598375	SOIL SAMPLE LOCATION MAP
403656301	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 5 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Based on the Operator's assessment of background conditions at the subject location, arsenic results for confirmation soil samples appear to be representative of background as opposed to E&P activities. Therefore, the Operator's demonstration of background will be accepted as an alternative to the default standard in ECMC's Table 915-1.	01/16/2024
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.	01/11/2024

Total: 2 comment(s)