FORM 27 Rev 5/22

State of Colorado
Energy & Carbon Management Commission

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Report taken by: Steven Arauza

Site Investigation and Remediation Workplan (Initial 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 INFORMATON

Name of Operator: CAERUS PICEANCE LLC Operator No: 10456
Address: 1001 17TH STREET #1600
City: DENVER State: CO Zip: 80202
Contact Person: Blair Rollins Email: brollins@caerusoilandgas.com

Phone Numbers
Phone: (970) 285-2925
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PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 35902 Initial Form 27 Document #: 403770780

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.
- [X] 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: SPILL OR RELEASE Facility ID: 486120 API #: County Name: RIO BLANCO
Facility Name: YCF 2-35-1 Waterline Release Latitude: 39.991028 Longitude: -108.356173
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWSE Sec: 2 Twp: 1S Range: 98W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GC
Most Sensitive Adjacent Land Use Non-Crop Land
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? No

Other Potential Receptors within 1/4 mile

Yellow Creek is located approximately 0.5 miles west.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

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

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	To be determined	Soil samples and 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.

While conducting pressure testing on the water gathering pipeline on the Location, a 2-inch thread was pulled from a check valve on the Location and began releasing produced water onto the surface of the well pad. The pressure test was immediately stopped, and emergency response activities were initiated. Two absorbent booms were installed in each of the two stormwater drainages downgradient of the point of release, and fluid recovery operations began immediately using water transport trucks. Additionally, an earthen berm was constructed surrounding the spill path to prevent the migration of impacts from leaving the pad surface through ongoing snowmelt. Approximately 15 barrels (bbls) of produced water was released from the gathering line and was contained to the working surface of the Location. As of March 4, 2024, 160 bbls of fluids, consisting mostly of snowmelt, have been recovered from the Location.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[X] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

Soil samples will be collected as needed to delineate the horizontal extent of soil impacts. Background samples may be collected to characterize native levels of inorganic constituents at the Location. Caerus requests a reduced analyte list of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes (BTEX), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, SAR, and boron. See the attached report of work completed (ROWC) for details.

Proposed Groundwater Sampling

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

Groundwater has not been encountered during site investigation activities. If groundwater is encountered, Caerus will notify the CECMC and attempt to collect a representative sample for analysis.

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: 23
Number of soil samples exceeeding 915-1: 23
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet): 5000

NA / ND

-- Highest concentration of TPH (mg/kg): 8330
-- Highest concentration of SAR: 11.2
BTEX > 915-1: Yes
Vertical Extent > 915-1 (in feet): 15

Groundwater

Number of groundwater samples collected: 0
Was extent of groundwater contaminated delineated? Yes
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
0 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?

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

Volume of solid waste (cubic yards): 12
Volume of liquid waste (barrels): 160

[X] Is further site investigation required?

See Proposed Sampling and the attached ROWC for details.

REMEDIAL ACTION PLAN

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Caerus is in the process of determining the extent of contamination associated with the project. Once determined, Caerus will provide a remediation strategy for ECMC review and approval on a Supplemental Form 27.

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 February 21, 2024, initial sampling support was completed to characterize soil impacts at the point of release (POR) and spill path. Released fluids were contained to the working surface of the pad. One soil sample was collected directly beneath the POR at 0.5 feet below ground surface (bgs). Additionally, seven characterization samples were collected, four from points within the spill path, and three samples to represent points of compliance outside of the spill path. Analytical results of the spill path samples indicate compliance with Table 915-1 Residential Soil Screening Levels (RSSLs) except for TPH, xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, SAR, and arsenic. Analytical results of the spill path samples indicate compliance with Table 915-1 RSSLs except for pH and arsenic.

On March 6, 2024, Caerus submitted Form 19 Document 403707728 to request a reduced analyte list of TPH, BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, SAR, pH, and arsenic and to request that results be compared to RSSLs. The ECMC approved the form and associated requests on March 11, 2024.

Between March 6, 2024, and April 9, 2024, three additional release investigations were completed with a hydro vacuum truck to confirm the removal of surface impacts along the spill path and to continue remedial excavation around the POR. Thirteen soil samples were collected: eight from points within the spill path (SB01, SB02, and SB08 through SB15), three soil samples were collected directly below the POR at depths ranging from 0.5 to 15 feet bgs, and two below SB15 to characterize material that was observed to have historic hydrocarbon staining. Analytical results of the spill path samples indicate compliance with Table 915-1 RSSLs except for TPH, benzene, ethylbenzene, xylenes, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, SAR, hot water soluble boron, and arsenic. See the attached ROWC for details.

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) 12
  - Name of Licensed Disposal Facility or ECMC 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.

In the event that groundwater is encountered during any phase of the project, Caerus will notify the ECMC and attempt to collect a representative sample for
analysis.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

[X] 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

[X] Other Initial Form 27 submittal and Q1 2024 REM status update

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.

Per Rule 705.b, and in line with guidance laid out in the SBAP, Caerus has general liability insurance in the amount of $1M, and Caerus has umbrella insurance, which sits over the general liability insurance in the amount of $75M. The umbrella and general liability insurance covers property damage, bodily injury to third parties, and sudden or accidental pollution under a combined $76M.

Operator anticipates the remaining cost for this project to be: $ 20000

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 of impacted soil.

Volume of E&P Waste (solid) in cubic yards 12

E&P waste (solid) description Hydrocarbon impacted soils

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Greenleaf Environmental Services - De Beque, Colorado

Volume of E&P Waste (liquid) in barrels 160

E&P waste (liquid) description Produced water and hydrocarbon impacted snow melt

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Greenleaf Environmental Services - De Beque, Colorado

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.

Any disturbance will be returned to the active working surface of the well pad for continued operation. When the site is decommissioned at a later date, it will be reclaimed in accordance with 1000 Series regulations.

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.

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.

Actual Spill or Release date, or date of discovery.

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/21/2024

Proposed site investigation commencement. 02/21/2024

Proposed completion of site investigation. 08/01/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 02/21/2024

Proposed date of completion of Remediation. 08/01/2027

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

This form has been submitted to open a Remediation Project Number for Spill/Release Point ID 486120 and provide a Q1 2024 status update to the CECMC.

Although pH and arsenic values above Table 915-1 RSSLs remain within the investigation area, analytical results of produced water from the YCF 35-33 -1 well pad (ECMC Location ID 316660) revealed a natural pH at 7.41 with no detectable arsenic. The pipeline associated with the release transports fluids directly from this well pad through the affected YCF XOM 2-35-1 pipeline. The YCF XOM 2-35-1 well had been shut in prior to the release, and all fluids originated from the YCF 33-35-1 well, located 1.25 miles north of the site. Therefore, the water sample represents the fluid release at the Location. Caerus requests consideration of Rule 915.e.2.C to exclude pH and arsenic as constituents of concern for this project as the produced water characterization data indicates that elevated pH and arsenic levels in the project area are likely natural occurrences rather than effects of oil and gas production activities.

Assuming the process knowledge/produced water characterization results are accepted, levels of TPH, benzene, ethylbenzene, xylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, SAR, and hot water soluble boron exceeding Table 915-1 RSSLs remains undelineated horizontally in the investigation area. Based on these results, Caerus proposes additional site investigation to delineate remaining soil impacts horizontally in all directions from the POR. Based on characterization results from the POR and material of interest (MOI) samples, Caerus will include hot water soluble boron analysis in all future soil samples in addition to the approved reduced analyte list.

See the attached ROWC for details.

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

Signed: Blair Rollins Title: Environmental Specialist

Submit Date: 05/21/2024 Email: brollins@caerusoilandgas.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: Steven Arauza Date: 06/18/2024

Remediation Project Number: 35902

COA Type	Description
	Submit Supplemental eForm 19 to request closure of Spill/Release ID #486120. Supplemental report shall comply with outstanding COAs, indicate that work is proceeding under an approved eForm 27 and shall reference the Remediation Project number assigned upon approval of this report.
	Comply with COGCC Rule 1105 flowline abandonment requirements, including notification and verification requirements.
	Operator shall collect soil samples from areas most likely to be impacted and shall collect an appropriate number of representative soil samples to delineate the horizontal and vertical extents of contamination, per Rule 915.e.(2).B.
	Operator shall collect sample(s) from comparable, nearby non-impacted native soil for purposes of establishing background soil conditions including pH and sodium adsorption ratio (SAR), per Rule 915.e.(2).D.
	Per Rule 913.b.(2), the Operator will conduct sampling and analysis of soil, and groundwater--if encountered, to determine the horizontal and vertical extent of any contamination in excess of the cleanup concentrations in Table 915-1 for soil and groundwater. The Operator shall analyze samples for the complete approved analyte list and shall compare analytical results for site investigation samples to the Table 915-1 Residential Soil Screening Level Concentrations.
	The Soil Analytical Results Table included in attached report (doc#403798736) does not accurately present documented TPH exceedances. Soil samples SB01@0.5 and SB16@12.5 have TPH exceedances but are not highlighted to document exceedances of Table 915-1. Samples with exceedances for GRO or DRO should include highlights across all TPH components (e.g., GRO, DRO, AND ORO) because the Table 915-1 contaminant of concern is the sum of all three components. In addition to exceedances documented in the attached Soil Analytical Results Table, TPH exceedances at the area represented by soil sample ID 20240409-YCF XOM 2-35 -1-(SB16)@12.5 require horizontal delineation. For future submittals, ensure that any samples that exceed 500 mg/kg for TPH (which is GRO + DRO + ORO) are highlighted on the analytical summary tables provided.

	Based on the information provided, the Operator's request for a reduced analyte suite of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes (BTEX), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, SAR, and boron is approved under the following condition: Operator will continue to analyze soil samples for arsenic and pH until background conditions are established.
7 COAs	

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
403770780	INVESTIGATION/REMEDIATION WORKPLAN (INITIAL)
403798736	SITE INVESTIGATION REPORT
403828955	FORM 27-INITIAL-SUBMITTED

Total Attach: 3 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)