

State of Colorado  
Oil and Gas Conservation Commission

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Report taken by:  
Steven Arauza

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: CAERUS PICEANCE LLC	Operator No: 10456	<b>Phone Numbers</b>
Address: 1001 17TH STREET #1600		Phone: (970) 285-2925
City: DENVER State: CO Zip: 80202		Mobile: (970) 640-6919
Contact Person: Blair Rollins	Email: brollins@caerusoilandgas.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 15310 Initial Form 27 Document #: 402330404

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: SPILL OR RELEASE	Facility ID: 436984	API #: _____	County Name: MESA
Facility Name: SPILL/RELEASE POINT	Latitude: 39.174408	Longitude: -108.100545	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWN	Sec: 22	Twp: 10S	Range: 96W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GM Most Sensitive Adjacent Land Use Agricultural Operation  
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? No

Other Potential Receptors within 1/4 mile

### 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	5 x 10	Laboratory analytical results

#### INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

The site was excavated the failed section of pipeline was replaced and soils were sampled to determine if impacts existed.

#### 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 ):

Additional sampling will be necessary for vertical delineation of SAR and EC, Caerus is requesting continue remediation under 915.f.

##### Proposed Groundwater Sampling

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

##### 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

NA / ND

Number of soil samples collected 121

-- Highest concentration of TPH (mg/kg) 107

Number of soil samples exceeding 915-1 84

-- Highest concentration of SAR 98.3

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

BTEX > 915-1 No

Approximate areal extent (square feet) 4750

Vertical Extent > 915-1 (in feet) 27

**Groundwater**

Number of groundwater samples collected 0

NA Highest concentration of Benzene (µg/l) \_\_\_\_\_

Was extent of groundwater contaminated delineated? Yes

NA Highest concentration of Toluene (µg/l) \_\_\_\_\_

Depth to groundwater (below ground surface, in feet) 100'

NA Highest concentration of Ethylbenzene (µg/l) \_\_\_\_\_

Number of groundwater monitoring wells installed 0

NA Highest concentration of Xylene (µg/l) \_\_\_\_\_

Number of groundwater samples exceeding 915-1 0

NA 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?

Area background samples have been collected for Arsenic. Caerus requests Arsenic concentration of comparable background which have been identified at (2-5.9mg/kg) see previously submitted document #402591029, #402574382, and #402574381. Of the 121 samples collected to date 71 of them are background. The area surrounding the Point of release has been identified with elevated organics including SAR, pH, and EC. SAR concentrations range from 0.072 at the surface to 98.3 from 13-17' below ground surface (bgs). EC background concentrations ranged from 0.29 to 4.37mmhos/cm and pH of 8.5 to 10.2

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?

\_\_\_\_\_

**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.

After collection of additional background samples it has been determined that the original area thought to have SAR exceedances are well below the native soils SAR concentrations within the background. The original source was removed via hydrovac and hauled to the NSF for disposal.

**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.

A reduced analyte suite was approved on 11/19/2020 doc # 402529576. No additional remediation is proposed Caerus will continue to monitor the area for noxious weeds and suitable growth.

**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  
\_\_\_\_\_ Natural Attenuation  
\_\_\_\_\_ Other \_\_\_\_\_

\_\_\_\_\_ Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_

\_\_\_\_\_ Excavate and onsite remediation

\_\_\_\_\_ No Land Treatment  
\_\_\_\_\_ No Bioremediation (or enhanced bioremediation)  
\_\_\_\_\_ No Chemical oxidation  
\_\_\_\_\_ No Other \_\_\_\_\_

### **Groundwater Remediation Summary**

\_\_\_\_\_ No Bioremediation ( or enhanced bioremediation )  
\_\_\_\_\_ No Chemical oxidation  
\_\_\_\_\_ No Air sparge / Soil vapor extraction  
\_\_\_\_\_ No Natural Attenuation  
\_\_\_\_\_ No 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.

If groundwater is encountered at any of the proposed sampling locations, Caerus will attempt to collect a representative groundwater sample for laboratory analysis of table 915-1 with findings reported in a supplemental Form 27.

## **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 \_\_\_\_\_

### **WASTE DISPOSAL INFORMATION**

Was E&P waste generated as part of this remediation? No

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

\_\_\_\_\_

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

E&P waste (solid) description \_\_\_\_\_

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: \_\_\_\_\_

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_

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.

The site has been graded and seeded at the time of pipeline repairs, the site has growth and will continued to be monitored.

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? Yes \_\_\_\_\_

If YES, does the seed mix comply with local soil conservation district recommendations? Yes \_\_\_\_\_

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. 05/14/2020

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/14/2014

Proposed site investigation commencement. 04/30/2014

Proposed completion of site investigation. 08/26/2014

### 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**

The pipeline failure occurred below KE Rd within the primary dry gas pipeline, the fluid release occurred above ground from the road casing vent pipe off the secondary sealed pipeline that encases the primary pipeline. EHS personal arrived at the leak and identified fluid spraying out of the riser vent in a mist which had run downhill into the roadside ditch immediately adjacent to the riser vent. A Hydrovac was dispatched, and all moist soils were recovered, the soils below the riser vent did not show signs of moisture below 2 feet below ground surface. Due to the release occurring from the pipeline post drying and separation at the Plateau Compressor Station minimal fluid was within the pipeline. The spill was identified and reported as 2 barrels. The location of the spill was approximately 8 to 10 ft south of KE road near the pipeline riser. The produced water released flowed downgradient towards KE road and west along the roadside ditch. The locations of SB1 and SB1R are approximately 60 to 70 ft south and approximately 30 to 40 ft higher in elevation than the spill origin in an area which was not impacted by the release. see attached image. During pipeline repair, the area around SB1 and SB1R was excavated to a depth of approximately 6 ft-bgs in order to remove the old pipeline a trench was cut so the pipeline could be pulled out of the outer casing pipeline without damaging KE road. The soil, and SAR concentrations present, at SB1 and SB1R below the 6 ft excavated depth should be considered native undisturbed soils. The estimate for produced water spilled was two barrels with one barrel recovered. Approximately two cubic yards of material were subsequently excavated. Soil results from background soil borings clearly indicate that naturally elevated SAR and pH are present in and adjacent to the spill area. When compared to the background results, it is reasonable to suspect that the SAR encountered in SB1 and SB1R is natural occurring. The SAR concentration in SB1 at the 4 to 6 ft interval was within local background level with the highest SAR concentrations were at the 10 to 17 ft interval. The SAR concentrations in SB1R were 63.2 at the 20 to 25 ft interval, then decreased to 20.1 at the 22 to 23 ft interval then increased to 76.8 at the 23 to 24 ft interval indicating highly variable background concentrations. The presence of elevated SAR at the surface was likely due to the deeper native soils being mixed in during the backfill process and not as a direct result of the produced water spilled. Excluding background samples, all subsurface sample results for EC were compliant with the applicable COGCC Table 915-1 Cleanup Concentration. All but 4 subsurface sample results for SAR were above the applicable COGCC Table 915-1 Cleanup Concentration.

Caerus will conduct additional background soil sampling to establish the background concentrations of surficial soil within the area.

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

Signed: Blair Rollins \_\_\_\_\_

Title: EHS Specialist \_\_\_\_\_

Submit Date: 03/11/2022 \_\_\_\_\_

Email: brollins@caerusoilandgas.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: Steven Arauza \_\_\_\_\_

Date: 04/04/2022 \_\_\_\_\_

Remediation Project Number: 15310 \_\_\_\_\_

### **Condition of Approval**

#### **COA Type**

#### **Description**

	Operator needs to establish background concentrations for Soil Suitability for Reclamation criteria in soil at the surface and within the root zone.
	Attached report states: "the SAR present in the surface soils will eventually percolate below vegetative growth zones, however it is recommended that soil amendments be incorporated to better allow for future plant nutrient uptake."  This F27 does not indicate any plans to proceed with soil amendment.  Operator shall 1) establish depths of vegetative root zones, 2) propose and document soil amendments and, 3) monitor vegetative growth OR provide justification for the decision to not move forward with the soil amendment recommendation in the attached report.
2 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>
402875116	FORM 27-SUPPLEMENTAL-SUBMITTED
402875249	MONITORING REPORT
402875284	PHOTO DOCUMENTATION
402875298	AERIAL IMAGE

Total Attach: 4 Files

### General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	In the event that the Operator seeks to leave material with elevated SAR, EC, pH and/or boron in situ, the Operator needs to comply with Rule 915.b. These questions remain: what is the site-specific root zone for native, undisturbed soils in adjacent areas and do exceedances remain within the root zone that threaten establishment of vegetation in the impacted area?	04/04/2022
Environmental	Soil data table in attached report has SB1 and SB1R samples labeled as "Background" while only one sample, SB1 (5-6.5) is labeled as "Spill."	04/04/2022
Environmental	Page 3 of the attached report (doc #402875249) asserts a "local background [SAR] concentration of 68.6." The COGCC does not concur with the claim that 68.6 is an appropriate site-specific background SAR concentration for this project. Additional information is required to establish a specific background SAR level.  Analytical results for soil boring samples demonstrate elevated and variable concentrations of SAR in this area.	04/04/2022
Environmental	Attached report indicates recommendation for soil amendments to be incorporated to promote vegetative growth. Operator has not described addition of soil amendments moving forward. Background surface samples collected in 2018 and 2020 (doc #402529659) demonstrate compliance with Table 910-1 for samples collected from the top 0-24" within the site investigation area.  Additional action is required (define root zone depth, amend soils, monitor for effectiveness) before project can be considered for NFA.	12/21/2021

Total: 4 comment(s)