

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
CARLOS LUJAN

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATON

Name of Operator: CAERUS PICEANCE LLC	Operator No: 10456	Phone Numbers
Address: 1001 17TH STREET #1600		Phone: (970) 285.2739
City: DENVER State: CO Zip: 80202		Mobile: (970) 987.4650
Contact Person: Brett Middleton	Email: bmiddleton@caerusoilandgas.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 7742 Initial Form 27 Document #: 2232896

PURPOSE INFORMATION

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
<input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure	<input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
<input type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation	<input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project
<input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste	<input type="checkbox"/> Rule 906.c.: Director request
<input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure	<input checked="" type="checkbox"/> Other LINED EARTHEN PIT CLOSURE

SITE INFORMATION N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: PIT	Facility ID: 425547	API #: _____	County Name: GARFIELD
Facility Name: A28 595	Latitude: 39.590860	Longitude: -108.053800	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NENE	Sec: 28	Twp: 5S	Range: 95W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications MH Most Sensitive Adjacent Land Use RANGELAND

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

THERE ARE 2 SURFACE WATER RECEPTORS, AND NO WATER WELLS WITHIN 1/4 MILE OF THE WELL PAD.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- | | | |
|--|--|--|
| <input type="checkbox"/> E&P Waste | <input checked="" type="checkbox"/> Other E&P Waste | <input type="checkbox"/> Non-E&P Waste |
| <input type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | _____ |
| <input type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input type="checkbox"/> Condensate | <input type="checkbox"/> Pigging Waste | |
| <input type="checkbox"/> Drilling Fluids | <input type="checkbox"/> Rig Wash | |
| <input type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Spent Filters | |
| | <input checked="" type="checkbox"/> Pit Bottoms | |
| | <input type="checkbox"/> Other (as described by EPA) | _____ |

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
	SOILS	IMPACTS WILL BE DETAILED IN FORM 19	IMPACTS WILL BE DETAILED IN FORM 19

INITIAL ACTION SUMMARY

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

All activities conducted in support of this pit closure project were carried out in accordance with COGCC Rules 905, 907, and 909 for conducting a site investigation in support of pit closures. The following activities have, or will be carried out in support of pit closure activities conducted in support of this project: 905.b(2) & 905.b(4) ? All above-liner fluids and solids will be removed from the pit and will be

reused or disposed of at a permitted disposal facility under manifest. 905.b(3) ? Liners will be removed, and reused/recycled or disposed of at a permitted disposal facility under manifest. 905.b(4) ? Representative samples will be collected from the pit bottom following removal of the pit liner and will be analyzed for compliance with COGCC Table 910-1. Sample results will be provided to the COGCC in supplementary submission(s) for this remediation project. 905.c ? In the event that levels of the constituents of concern found below the liner are in excess of Table 910-1 allowable concentrations and above background concentrations, a Form 19

(Spill/Release Report) will be submitted to document the failure of the pit liner and subsequent release of fluids. If below-liner concentrations are above Table 910-1 allowable concentrations, but below

background no Form 19 will be submitted. However, a Form 4 (Sundry Notice) will be

submitted to document the onsite disposal of material in excess of the allowable

concentrations identified in Table 910-1.

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):

see attached

Proposed Groundwater Sampling

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

Ground water is not expected to be found.

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):

see attached

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 69

Number of soil samples exceeding 910-1 49

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 1600

NA / ND

-- Highest concentration of TPH (mg/kg) 15746

-- Highest concentration of SAR 79.2

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 25

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 910-1

 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 910-1

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?

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?

The site investigation for this project will be carried out as described above. All analytical data collected in support of this remediation project will be provided to the COGCC in a Form 19, if applicable, and/or in a Form 4 (Sundry Notice or Notification of Completion). A site diagram showing the location of collected samples will also be provided.

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.

Any impacted material identified below the liner would be evaluated upon discovery and depending upon severity would be removed using heavy equipment and remediated onsite, remediated in-situ, or disposed of offsite at a permitted disposal facility. Successful completion of remediation efforts will be demonstrated through sample collection and laboratory analysis conducted in accordance with COGCC Rule 910, and to reflect the procedures described above. These activities would be described in the Sundry Notice / Notification of Completion for this remediation project. Any impacts identified below the liner would be documented and reported on a Form 19 (Spill/Release Report).

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.

see attached

Soil Remediation Summary

In Situ

Yes _____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

Yes _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

Yes _____ Other Bio Vent wells _____

Ex Situ

_____ Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) _____

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.

In the event that impacts to groundwater are identified, a vertical and lateral extent would be determined by a third party contractor and an appropriate insitu remediation and monitoring plan would be prepared and submitted to the COGCC for prior approval.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other boring logs and are of influence map per COA 2/15/18

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? _____

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 _____

Do all soils meet Table 910-1 standards? _____

Does the previous reply indicate consideration of background concentrations? _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? _____

Does Groundwater meet Table 910-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

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 footprint for the backfilled pit occurs within the boundary for this location. During reclamation the backfilled pit may be part of the pad's working surface and/or covered by recontoured and reseeded slopes installed to meet reclamation objectives. The Form 4 (Notification of Completion) submitted for this project will identify the reclamation status of the location at the time of pit closure. Interim and final

reclamation activities will be carried out in accordance with COGCC 1000 Series (Reclamation Regulations).

Is the described reclamation complete? _____

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

Interim? Final?

Did the Surface Owner approve the seed mix? _____

If NO, does the seed mix comply with local soil conservation district recommendations? _____

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. _____

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

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

Date of commencement of Site Investigation. 06/09/2009

Date of completion of Site Investigation. 11/05/2009

REMEDIAL ACTION DATES

Date of commencement of Remediation. 06/09/2009

Date of completion of Remediation. 11/05/2009

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

Caerus' SVE trailer was used to test communication between surrounding bio-vent wells within the area of the pit footprint. The SVE trailer was used to apply a measured vacuum to the well, while surrounding bio-vent wells were observed for vacuum to determine a radius of influence.

The pilot test data was used to calculate vacuum versus distance from each observation well when a known vacuum was applied to the corresponding bio-vent well, represented as a radius of influence (ROI). SVE pilot test results demonstrate communication between the bio-vent wells within the footprint of the soils pile. Due to site conditions, SVE05 and SVE06 were not tested. During the pilot test, no vacuum was observed in surrounding wells when testing SVE10, SVE12, and SVE14.

ROI distances were determined by evaluating a trend line for each SVE well to determine the distance where 0.1 inches of vacuum will be observed for each well.

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

Signed: Brett Middleton

Title: Sr. Env. Specialist

Submit Date: 03/02/2018

Email: bmiddleton@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: CARLOS LUJAN

Date: 04/02/2018

Remediation Project Number: 7742

COA Type**Description**

COA Type	Description

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**

Att Doc Num	Name
401561513	FORM 27-SUPPLEMENTAL-SUBMITTED
401561579	MAP
401561580	LOGS

Total Attach: 3 Files

General Comments**User Group****Comment****Comment Date**

User Group	Comment	Comment Date
Environmental	Continue using the SVE system and report progress	04/02/2018
Environmental	Thanks for sharing the results of the SVE radius of influence maps	04/02/2018

Total: 2 comment(s)