

State of Colorado Oil and Gas Conservation Commission

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Report taken by:

CHRIS CANFIELD

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 INFORMATION

Name of Operator: CRESTONE PEAK RESOURCES OPERATING LLC	Operator No: 10633	Phone Numbers
Address: 1801 CALIFORNIA STREET #2500		Phone: (303) 7743985
City: DENVER State: CO Zip: 80202		Mobile: (720) 2365525
Contact Person: David Tewkesbury	Email: David.Tewkesbury@CrestonePR.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 17442

Initial Form 27 Document #: 402638297

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 checked="" 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 type="checkbox"/> Other _____ |

SITE INFORMATION

N Multiple Facilities (in accordance with Rule 909.c.)

Facility Type: LOCATION	Facility ID: 321533	API #: _____	County Name: BROOMFIELD
Facility Name: ALAUX F UNIT-61N68W 26NWNW	Latitude: 40.026688	Longitude: -104.976525	
** correct Lat/Long if needed: Latitude: 40.026733		Longitude: -104.976917	
QtrQtr: NWNW	Sec: 26	Twp: 1N	Range: 68W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SC

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? Yes

Other Potential Receptors within 1/4 mile

Occupied structures

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	GROUNDWATER	GW01	Laboratory analysis
No	SOILS	No impacts	Field-screening 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.

This form has been prepared to request approval to remove the partially buried produced water vessel associated with this location. On March 22, 2021, the produced water vessel floated; no spill or release was associated with this incident. On March 23, 2021 after discussion with multiple COGCC personnel, the vessel was removed and surrounding soils and groundwater were sampled. Crestone proposes to collect at least five soil samples: one sample from each sidewall and a base sample. Soil samples will be field-screened using a photoionization detector (PID). The soil sample which displays the highest degree of impacts as determined by field-screening, visual observations of staining, and hydrocarbon odor will be submitted for the full Table 915-1 analyte list. Subsequent soil samples will be analyzed for any constituents of concern which exceed Table 915 allowable limits in the most impacted sample and that cannot be cleared by background levels. If the most impacted sample does not exceed for any constituents of concern, the subsequent sample(s) will be analyzed for TPH (DRO, GRO, and ORO) and BTEX. At least one base sample and one sidewall sample will be submitted for laboratory analysis. Background samples may be collected during site investigation to characterize background levels of inorganic constituents in native soils.

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):

Crestone proposes to collect at least five soil samples: one sample from each sidewall and a base sample. Soil samples will be field-screened using a photoionization detector (PID). The soil sample which displays the highest degree of impacts as determined by field-screening, visual observations of staining, and hydrocarbon odor will be submitted for the full Table 915 analyte list. Subsequent soil samples will be analyzed for any constituents of concern which exceed Table 915 allowable limits in the most impacted sample and that cannot be cleared by background levels. If the most impacted sample does not exceed for any constituents of concern, the next most suspect sample will be analyzed for TPH (DRO, GRO, and ORO) and BTEX, and field-screening results may be used to clear the remaining excavation area. At least one base sample and one sidewall sample will be submitted for laboratory analysis.

Proposed Groundwater Sampling

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

If groundwater is encountered during excavation activities, a sample will be collected and analyzed for Table 915 groundwater constituents of concern. One or more background groundwater samples may be collected as part of site investigation.

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 8
Number of soil samples exceeding 910-1 0
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 11.8
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 0

Groundwater

Number of groundwater samples collected 2
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 4'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 2
-- Highest concentration of Toluene (µg/l) 1.3
ND Highest concentration of Ethylbenzene (µg/l)
ND Highest concentration of Xylene (µg/l)
NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected
 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?

Three soil (BKG01@3, BKG02@3, and BKG03@3) and one groundwater (BKG-GW-A) background samples were collected as part of this remediation investigation. Soil background samples were analyzed for pH, EC, SAR, arsenic, and selenium to establish native background levels in soils. The groundwater background sample was analyzed for chlorides, sulfates, and total dissolved solids to establish native background levels in groundwater. Background soil samples indicated native EC, SAR, arsenic, and selenium levels in exceedance of COGCC Table 915-1 allowable limits. The background groundwater sample indicated native sulfate and chloride levels in exceedance of COGCC Table 915-1 allowable limits.

☐ 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.

If impacts are identified by field observations or laboratory analysis, soils may be removed and transported to a licensed disposal facility. Waste manifests will be available upon request. If different remediation tactics are deemed necessary or preferred, they will be proposed for approval via F27s.

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.

Five soil samples were collected from the excavation: one base sample and four sidewall samples. Based on field-screening results, two soil samples were submitted for analysis of Table 915-1 constituents of concern as characterization samples. Analytical results for these samples indicate all organic constituents of concern were within COGCC Table 915 allowable limits. Exceedances of inorganic constituents (EC, SAR, pH, arsenic, and selenium) were reported for the characterization samples; therefore, soil background samples were collected around the location. These background samples and the remaining three excavation soil samples were analyzed for exceeding inorganic constituents. Analytical results indicate higher native levels of arsenic, selenium, and EC than those reported from the excavation, indicate native SAR levels within 1.2 times those reported from the excavation, and indicate native pH levels within 1.04 times those reported from the excavation.

A groundwater sample was collected from the base of the excavation and submitted for analysis of Table 915-1 constituents of concern. Laboratory results indicate all organic constituents of concern were within COGCC Table 915-1 allowable limits. A groundwater background sample was collected and analyzed to establish limits for 915 inorganic constituents of concern. Analytical results indicate total dissolved solids (TDS) and sulfate levels from the excavation groundwater are within the allowable 1.25 times native concentrations. Chloride concentrations register 1.66 times higher than native levels. A site history review reveals that the COGCC approved fertilizer application in the 2020 remedial excavation to treat groundwater impacts related to Remediation Project #15751. Chlorides are a common ingredient in fertilizers, most often in the form of potassium chloride from potash. The nitrogen, phosphate, and/or potassium in fertilizer react out, leaving behind components such as chlorides.

Soil Remediation Summary

☒ In Situ

- _____ Bioremediation (or enhanced bioremediation)
- _____ Chemical oxidation
- _____ Air sparge / Soil vapor extraction
- _____ Natural Attenuation
- _____ Other _____

☐ 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.

No groundwater monitoring is proposed for this site related to Remediation Project #17442. Groundwater monitoring related to Remediation Project #15751 is ongoing.

REMEDATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Closure Request

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: _____

REMEDATION COMPLETION REPORT

REMEDATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? Yes _____

Do all soils meet Table 910-1 standards? Yes _____

Does the previous reply indicate consideration of background concentrations? Yes _____

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? No _____

Is additional groundwater monitoring to be conducted? No _____

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.

This facility remains in production; reclamation is not scheduled at this time. When the facility is decommissioned at a later date, reclamation activities will be completed in accordance with 1000 Series Rules.

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 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). _____ 03/23/2021

Date of commencement of Site Investigation. _____ 03/23/2021

Date of completion of Site Investigation. _____ 04/13/2021

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

This form has been submitted to request closure of Remediation Project #17442. All organic constituents of concern are within COGCC Table 915-1 allowable limits for soil and groundwater. Soil inorganic constituent exceedances and groundwater sulfate exceedances are attributed to native background concentrations. The groundwater chloride exceedance is attributed to COGCC-approved fertilizer application in the location of the 2020 remedial investigation excavation related to Remediation Project #15751 which is ongoing at this time under an approved COGCC Table 910-1 extension request.

Please find all investigation data pertaining to the 2021 produced water vessel removal attached.

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

Signed: David Tewkesbury

Title: Environmental Specialist

Submit Date: 05/12/2021

Email: David.Tewkesbury@CrestonePR.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: CHRIS CANFIELD

Date: 05/17/2021

Remediation Project Number: 17442

Condition of Approval**COA Type****Description**

	Based on the information presented, it appears that no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required.
	The surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules. For locations with active ongoing oil and gas operations, comply with Rule 1003 interim reclamation requirements and for locations that will no longer have active oil and gas operations, comply with Rule 1004 Final Reclamation requirements.
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.

Att Doc Num**Name**

402658374	FORM 27-SUPPLEMENTAL-SUBMITTED
402687349	OTHER

Total Attach: 2 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)