

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
PETER GINTAUTAS

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>CRESTONE PEAK RESOURCES OPERATING LLC</u>	Operator No: <u>10633</u>	Phone Numbers
Address: <u>1801 CALIFORNIA STREET #2500</u>	City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80202</u>	Phone: <u>(303) 7744017</u>
Contact Person: <u>Schuyler Hamilton</u>	Email: <u>SHamilton@CiviResources.com</u>	Mobile: <u>(720) 9251820</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 16598 Initial Form 27 Document #: 402591326

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>SPILL OR RELEASE</u>	Facility ID: <u>479236</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Sheley 1 separator</u>	Latitude: <u>40.163573</u>	Longitude: <u>-104.899443</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NESW</u>	Sec: <u>4</u>	Twp: <u>2N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>479258</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Sheley 1 battery</u>	Latitude: <u>40.163470</u>	Longitude: <u>-104.899489</u>	
** correct Lat/Long if needed: Latitude: <u>40.163554</u>		Longitude: <u>-104.899792</u>	
QtrQtr: <u>SESW</u>	Sec: <u>4</u>	Twp: <u>2N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: SPILL OR RELEASE Facility ID: 479403 API #: _____ County Name: WELD
Facility Name: Sheley 1 Battery Latitude: 40.163659 Longitude: -104.899719
** correct Lat/Long if needed: Latitude: _____ Longitude: _____
QtrQtr: SESW Sec: 4 Twp: 2N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE Facility ID: 480273 API #: _____ County Name: WELD
Facility Name: Sheley 1 Latitude: 40.163715 Longitude: -104.899720
** correct Lat/Long if needed: Latitude: _____ Longitude: _____
QtrQtr: SESW Sec: 4 Twp: 2N Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM 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	Approximately 80' x 80'	Monitoring Wells
Yes	SOILS	160' x 120' (undefined vertically)	Soil Borings

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 remediation project was initiated to support removal of two partially buried produced water vessels which were previously removed from this production facility without the required soil sampling. In response to this compliance gap, multiple investigative soil borings were completed in and around the previous locations of the vessels. Soil and groundwater samples from the initial soil boring locations confirmed organic and inorganic impacts above Table 915-1 allowable limits and were reported as Spill/Release Point ID 479403. Two additional spills/releases have since been added to this Remediation Project: 480273 and 479236. 480273 was a release of produced water from a separate partially buried vessel discovered June 21, 2021. 479236 was a release of produced water from a separator leg discovered January 20, 2021. Additional soil borings were installed to delineate the extent of soil impacts. Select soil borings were completed as monitoring wells to delineate the extent of groundwater impacts and to allow for quarterly monitoring of groundwater impacts. Based on analytical data from the abovementioned sampling efforts, soil and groundwater organic and inorganic constituents of concern have been horizontally delineated.

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 does not propose additional soil sampling at this time.

Proposed Groundwater Sampling

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

Groundwater samples will be collected and analyzed for Table 915-1 constituents of concern until results are within COGCC allowable limits for four consecutive quarters. Q1 2022 groundwater sampling is scheduled for late March 2022.

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 44
Number of soil samples exceeding 915-1 26
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 40000

NA / ND

-- Highest concentration of TPH (mg/kg) 1381
NA Highest concentration of SAR _____
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 6

Groundwater

Number of groundwater samples collected 41
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 6`
Number of groundwater monitoring wells installed 12
Number of groundwater samples exceeding 915-1 24

-- Highest concentration of Benzene (µg/l) 61
-- Highest concentration of Toluene (µg/l) 39
-- Highest concentration of Ethylbenzene (µg/l) 240
-- Highest concentration of Xylene (µg/l) 1900
NA 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?

Several background soil samples were collected and submitted for inorganic constituents of concern to characterize native levels of inorganics. Analytical results of pH for BKG06@4 registered at 8.87, demonstrating elevated native pH at the site. One waste characterization sample (PW01) was also collected from the produced water on site and analyzed for Table 915-1 metals. Based on the results from PW01, the produced water at the site is not a significant source of arsenic (0.002974 mg/L), barium (8.92 mg/L), or selenium (<0.001 mg/L). Two background groundwater samples were collected to characterize native concentrations of total dissolved solids (TDS), chlorides, and sulfates. Based on analytical results, Crestone proposes the following alternative allowable limits for TDS, chloride and sulfate: 1850 mg/L, 106 mg/L, and 577 mg/L respectively. Data for background samples and further background result considerations are attached.

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?

Groundwater samples will be collected from installed wells and submitted for analysis of Table 915-1 constituents on a quarterly basis until results are within Table 915-1 allowable limits for four consecutive quarters.

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Soils and water may be removed and transported to a licensed disposal facility. Waste manifests will be available upon request.

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 Site Investigation History for an overview of site investigation initiation and history. In Q3 2021, additional soil samples were collected to delineate the extents of inorganic soil impacts and to further characterize native soil inorganics. Analytical results of the waste characterization sample (PW01), indicate that produced water at the site is not a significant source of Table 915-1 metals. Analytical results from BKG06@4 indicate that native levels of pH are elevated above Table 915-1 allowable limits at 8.87. The highest pH value from spill investigation samples at the site registered at 8.93, only 1.007 times higher than established native conditions. For these reasons, Crestone proposes that the COGCC remove pH, arsenic, barium, and selenium exceedances from consideration for Remediation Project Number 16598. EC and SAR remain in exceedance for soil samples collected in support of the separator release (Spill/Release Point ID 479236) and are delineated by soil samples collected September 14, 2021. Soil organics were delineated horizontally by March 12 and April 27, 2021 soil boring and monitoring well installation. Organic soil exceedances could not be delineated vertically at MW07 due to retrieval limitations of the saturated sandy soil. Third quarter 2021 groundwater results indicate a benzene exceedance for MW07; all other samples were within Table 915-1 allowable limits for organic constituents. MW05, MW06, and MW07 exceeded Table 915-1 allowable limits for inorganic constituents. Given the number and spread of installed monitoring wells at the site, the location of soil impacts at the site, the demonstrated static nature of the impact plume, shallow groundwater, and varied soil lithologies, Crestone proposes to continue to monitor impacts at the site via quarterly groundwater sampling to ensure impacts remain delineated and do not migrate to other potential sources while Crestone evaluates viable remediation technologies.

Soil Remediation Summary

<input type="checkbox"/> In Situ	<input type="checkbox"/> 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

Yes _____ 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.

Twelve groundwater monitoring wells are currently installed at the site and are monitored on a quarterly basis. As of Q2 2021, organic exceedances are limited to MW07, and groundwater impacts are delineated. Groundwater samples will be collected and analyzed for Table 915-1 constituents of concern until results are within Table 915-1 allowable limits for four consecutive quarters.

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 _____
Groundwater and soil impact delineation progress report

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 _____

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.

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 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. 02/04/2021

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

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/12/2021

Proposed site investigation commencement. 02/16/2021

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

This has been submitted to provide Q3 2021 groundwater data and soil data to the COGCC and to propose an impact monitoring plan. Find site investigation information including a report of work completed, topographic map, site map, groundwater contour map, data tables, and lab reports attached.

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

Signed: Schuyler Hamilton

Title: Environmental Specialist

Submit Date: 12/30/2021

Email: SHamilton@CiviResources.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: PETER GINTAUTAS

Date: 01/03/2022

Remediation Project Number: 16598

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

	One groundwater sample from a point upgradient of spills/releases at the location was analyzed. Background values from this point can be used to establish local thresholds for concentrations of total dissolved solids and sulfate in groundwater at the site. The rule 915 locally adjusted background for TDS would be 1.25 times 1070mg/l (1337mg/l) and for sulfate would be 1.25 times 408mg/l (510mg/l). If other data is to be considered as background then there must be documentation of how those point are considered background including at least four quarterly groundwater contour events indicated the points to be considered are upgradient from spills and releases at the site.
	One soil background sample was analyzed for saturated paste pH with reported pH of 8.87. The pH measurements of seven soil samples collected in May and September of 2021 are all over 8.3 and less that 8.93. However these soil samples appear to be from areas not impacted by organics or produced water spills and are the only soil pH measurements reported in the summary tables attached to this report.
	Analytical data from produced water sample PW01 collected on 03/11/2021 indicates that the produced water is unlikely to be a significant contributing source of arsenic, barium or selenium found in soils at the location.
3 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**

402910258	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
402913474	REMEDATION PROGRESS REPORT
402914670	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 3 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)