

State of Colorado Oil and Gas Conservation Commission

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Report taken by:

Kari Brown

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>BONANZA CREEK ENERGY OPERATING COMPANY LLC</u>	Operator No: <u>8960</u>	Phone Numbers
Address: <u>410 17TH STREET SUITE #1400</u>		Phone: <u>(720) 315-8934</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80202</u>		Mobile: <u>()</u>
Contact Person: <u>Luke Kelly</u>	Email: <u>Lkelly@Bonanzacrk.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 15983 Initial Form 27 Document #: 402492917

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: <u>SPILL OR RELEASE</u>	Facility ID: <u>477881</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Park U-4-9XRLC Flowline</u>	Latitude: <u>40.348840</u>	Longitude: <u>-104.429914</u>	
** correct Lat/Long if needed: Latitude: <u>40.348840</u>		Longitude: <u>-104.429914</u>	
QtrQtr: <u>SWSW</u>	Sec: <u>34</u>	Twp: <u>5N</u>	Range: <u>63W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications GM Most Sensitive Adjacent Land Use Range Land

Is domestic water well within 1/4 mile? Yes 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

Wetlands ~900' SE, CR 50 ~400' W, Irrigation Ditch ~600' SW, Empire Intake Ditch ~1,200' S, Occupied Structure 700' W

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	~150' x 100'	Laboratory analysis
Yes	SOILS	~150' x 100"	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.

Internal corrosion allowed approximately 1,120 bbls of oil and 280 bbls of produced water to be released to the ground and subsurface. Once discovered the flowline was immediately shut in to stop the release and blown down to alleviate the remaining pressure on the line. The pooled fluid and approximately top 18" of soil were removed and hauled to a COGCC approved disposal facility. Ten potholes were dug and sampled to delineate the lateral extent of the subsurface impact and eight soil borings were drilled to delineate the vertical impact. Soil and groundwater samples were collected and submitted for laboratory analysis. An approximately 40' x 40' bell hole was dug around the flowline so the compromised section of the line could be removed and analyzed. The impacted soil was hauled to a COGCC approved disposal facility. Ten bags of activated carbon were mixed into the excavation to promote biodegradation. Bonanza Creek is currently working with an environmental consultant to develop an in situ remediation system to treat the remaining soil and groundwater remaining impact. Once the system is developed Bonanza Creek will update the Form 27 with additional information.

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):

Twentyfour grab type soil samples were collected to vertically and laterally delineate the release footprint. The ten samples collected from the potholes were analyzed for TPH, BTEX, EC, SAR, and pH. The 14 samples collected from the soil borings were analyzed for TPH and BTEX. Additional soil sampling will be conducted as necessary.

Proposed Groundwater Sampling

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

Ten groundwater samples were collected from the potholes used to laterally delineate the subsurface impact. The groundwater samples were submitted and analyzed for BTEX. Three residential wells were sampled on 9/26/2020 and analyzed for the 318A baseline suite. Another recently discovered monitoring well located approximately 375' NW of the release will be sampled on 9/30/2020. All analytical results will be included in a supplemental Form 27. BCEOC is working to develop an air sparge/soil vapor extraction remediation system to treat the remaining soil and groundwater impact in-place.

Proposed Surface Water Sampling

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

None

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 24
Number of soil samples exceeding 915-1 6
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 15000

Groundwater

Number of groundwater samples collected 16
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 2'
Number of groundwater monitoring wells installed 21
Number of groundwater samples exceeding 915-1 15

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.

NA / ND

-- Highest concentration of TPH (mg/kg) 17900
ND Highest concentration of SAR
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 5

NA Highest concentration of Benzene (µg/l)
NA Highest concentration of Toluene (µg/l)
NA Highest concentration of Ethylbenzene (µg/l)
NA Highest concentration of Xylene (µg/l)
NA Highest concentration of Methane (mg/l)

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?

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.

Bonanza Creek proposes to remediate the surficial impact through source removal. The subsurface impact to groundwater and saturated soils will be remediated via an air sparge system and a series of engineered product recovery trenches.

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.

Bonanza Creek will remove as much surficial impact as possible down to groundwater. Depending on the depth of groundwater at the time, source removal is estimated to be approximately 900 cubic yards. The removed media will be hauled under waste manifest to a COGCC approved disposal facility. Confirmation soil samples will be collected from the excavation in compliance with Table 915-1. Following removal, the excavation will be backfilled with clean fill material. Once backfilled the groundwater will be allowed to equilibrate and an accurate, uninfluenced groundwater flow direction will be established. Bonanza Creek proposes the installation of an air sparge system and a series of product recovery trenches. Bonanza Creek will continue to conduct quarterly groundwater sampling and report remediation progress via supplemental Form 27s. Based off soil type, depth to groundwater, and concentration levels, the estimated time of remediation required to obtain NFA is approximately 4 years. System start up and implementation depends on the ability and timing it takes to obtain a power drop from the local REA.

Soil Remediation Summary

☒ In Situ

Yes Bioremediation (or enhanced bioremediation)

No Chemical oxidation

Yes Air sparge / Soil vapor extraction

No Natural Attenuation

No Other _____

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 1000

Name of Licensed Disposal Facility or COGCC Facility ID # _____

No Excavate and onsite remediation

 Land Treatment

 Bioremediation (or enhanced bioremediation)

 Chemical oxidation

 Other _____

Groundwater Remediation Summary

Yes Bioremediation (or enhanced bioremediation)

No Chemical oxidation

Yes 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.

On May 27, 2021 a third party consultant conducted quarterly groundwater sampling of 16 of the 21 monitoring wells on location. Five wells were not sampled due to the presence of free product in the monitoring wells. Analytical results of the submitted samples indicate sulfate and TDS exceedances. All other analytes were non-detect. Bonanza Creek is currently obtaining the required county permits (B&E and FHDP) required to install the remediation skid. Once complete the skid will be set on location and the air sparge system will begin operation.

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? Yes

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

NA

Volume of E&P Waste (solid) in cubic yards 1207

E&P waste (solid) description Hydrocarbon bearing soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Buffalo Ridge Landfill

Volume of E&P Waste (liquid) in barrels 3000

E&P waste (liquid) description hydrocarbon impacted groundwater

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: NGL Water Solutions disposal well C-1 and C-6

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.

Upon installation of the remediation system, the disturbance area will be completely reclaimed to pre-disturbance conditions. Any excavations will be backfilled. The release footprint is located on a flat surface so recontouring will not be required. The area will be cross-rippled to a depth of ~18" to alleviate compaction. Topsoil and compost will be trucked in and the area will be crimped with straw and seeded with a surface owner approved seed mix.

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? 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. 09/09/2020

Actual Spill or Release date, or date of discovery. 09/09/2020

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/10/2020

Proposed site investigation commencement.

Proposed completion of site investigation.

REMEDIAL ACTION DATES

Proposed start date of Remediation. 09/09/2020

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

Q2 2021 - Quarterly Monitoring Report

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

Signed: Luke Kelly

Title: Senior Env. Specialist

Submit Date: 07/06/2021

Email: Lkelly@Bonanzacrk.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: Kari Brown

Date: 07/28/2021

Remediation Project Number: 15983

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

0 COA

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**

402738633

FORM 27-SUPPLEMENTAL-SUBMITTED

402738813

ANALYTICAL RESULTS

Total Attach: 2 Files

General Comments**User Group****Comment****Comment Date**Stamp Upon
Approval

Total: 0 comment(s)