

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

OPERATOR INFORMATION

Name of Operator: GRIZZLY OPERATING LLC	Operator No: 10531	Phone Numbers
Address: 5847 SAN FELIPE #3000		Phone: (970) 876-1959
City: HOUSTON State: TX Zip: 77057		Mobile: ()
Contact Person: Scott Ghan	Email: sghan@grizzlyenergyllc.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 14050 Initial Form 27 Document #: _____

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 checked="" 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: SPILL OR RELEASE	Facility ID: 466240	API #: _____	County Name: GARFIELD
Facility Name: Gibson Gulch Unit-66S91W/29SWSW 323972	Latitude: 39.492469	Longitude: -107.585501	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWSW	Sec: 29	Twp: 6S	Range: 91W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Rangeland

Is domestic water well within 1/4 mile? No 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:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste | <input 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 checked="" 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 type="checkbox"/> Pit Bottoms | |
| | <input type="checkbox"/> Other (as described by EPA) | _____ |

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	30x30x26	soil sampling

INITIAL ACTION SUMMARY

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

See COGCC Document Numbers 402149004 and 402191075 for work conducted prior to 11/14/19.

On 11/14/19, two soil borings were advanced to 26 feet bgs using hollow stem auger. As each soil boring was advanced, a geologist inspected the soil for the presence of hydrocarbon impacts and field screened soil samples using a photoionization detector (PID). No hydrocarbon impacts were observed in either soil boring. During the advancement of soil borings, refusal was encountered within each soil boring at 26 feet bgs. Soil samples were collected from soil boring SB-07 where field screening and observations indicated the highest potential for hydrocarbon impacts. No water was observed in soil boring SB-07. As approved in COGCC Document Number 402149004, soil samples were submitted for laboratory analysis of TPH GRO/DRO and BTEX. No soil samples were collected from MW-01, as it was installed in the same location as the previous soil boring SB-05.

During assessment activities, water was only observed in soil boring MW-01, which was converted to a groundwater monitoring well. On 11/15/19, MW-01 was developed and sampled for laboratory analysis of constituents identified in COGCC Table 910-1. Soil boring logs are included as an attachment to this form. Soil boring locations are depicted on the attached Figure 2. Laboratory analytical reports are attached and summarized in Tables 1 and 2.

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):

Proposed Groundwater Sampling

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

One groundwater sample will be collected quarterly from MW-01 and analyzed for BTEX, chloride, sulfate and TDS until compliance with COGCC Table 910-1 can be demonstrated for four straight quarters. Grizzly will continue to observe these parameters and compare to available background concentrations from nearby sources.

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 3
Number of soil samples exceeding 910-1 0
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 100

NA / ND

-- Highest concentration of TPH (mg/kg) 5.9
NA Highest concentration of SAR
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 26

Groundwater

Number of groundwater samples collected 1
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 25
Number of groundwater monitoring wells installed 1
Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 5.6
-- Highest concentration of Toluene (µg/l) 4.6
-- Highest concentration of Ethylbenzene (µg/l) 14
-- Highest concentration of Xylene (µg/l) 110
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?

See COGCC Document Number 402149004 regarding background arsenic information.

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.

Excavation activities removed approximately 440 cubic yards of hydrocarbon impacted soil. The soil was transported to Greenleaf Environmental Services in De Beque, Colorado for offsite disposal. Data collected through additional confirmation soil sampling (SB-07) suggests residual hydrocarbon impacts identified by excavation sample S WALL W. SIDE @ 18' have been remediated through aeration during the open excavation and natural attenuation.

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.

The majority of the source material was removed through excavation as previously stated. Remaining impacts identified by E. FLOOR @ 26' have been defined vertically by soil sample SB-05 25-27.5' and laterally through compliant samples collected at bedrock between 25 to 26 feet in soil borings SB-01 through SB-04, SB-06, and SB-07. Additionally, Grizzly mixed 400 pounds (lbs) of chemically oxidized granular activated carbon (GAC) into the excavation at the water level prior to backfilling to remediate residual dissolved phase hydrocarbons in the area of soil sample E. FLOOR @ 26'. During the installation of SB-05 / MW-1 which is in the same area of E. FLOOR @ 26', there were no indications of impacted soil. The GAC remedial effectiveness will be demonstrated through the analysis of COGCC Table 910-1 Concentrations Levels for water. Since remedial activities have commenced, the benzene concentration in groundwater observed in the excavation area has decreased from 45 ug/L on 9/5/2019, to 5.6 ug/L on 11/15/2019. All other analytes are compliant with COGCC Table 910-1 Concentration Levels. No GAC was applied to the area of S WALL W. SIDE @ 18' as groundwater was not encountered in this zone. GAC requires the presence of water to effectively remediate hydrocarbons.

Using a GPS, confirmation soil boring SB-07 was advanced in the immediate proximity of excavation soil sample S WALL W. SIDE @ 18' to characterize previously identified hydrocarbon impacts.

Please reference the Operator comments section for additional remediation summary information.

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)
- Yes _____ 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.

One groundwater sample will be collected quarterly from MW-01 and analyzed for BTEX, chloride, sulfate and TDS until compliance with COGCC Table 910-1 can be demonstrated for four straight quarters. Grizzly will continue to observe these parameters and compare to available background concentrations from nearby sources.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other _____

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 _____ 440

E&P waste (solid) description hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____ 159998

Non-COGCC Disposal Facility: _____

Volume of E&P Waste (liquid) in barrels _____ 0

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.

All disturbances will be returned to preexisting conditions.

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. 07/22/2019

Actual Spill or Release date, if known. 07/22/2019

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/24/2019

Date of commencement of Site Investigation. 08/29/2019

Date of completion of Site Investigation. _____

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

Additional Remediation Summary information:

Soil samples were collected from SB-07 where field screening indicated the highest potential of impacts. Soil samples were submitted at depth of 15 to 16.5 feet bgs, 20 to 21.5 feet bgs, and 25 to 26 feet bgs. Although a soil sample was not submitted from the 18-foot depth interval of SB-07, soil samples were submitted immediately above and below the previously identified impacted zone of 18 feet bgs. Laboratory analytical results were either below the laboratory detection limit or within COGCC Table 910-1 Concentration Levels for TPH and BTEX. Field screening of soil samples during the advancement of SB-07 did not indicate any hydrocarbon impacts to soil at 18 feet bgs. This analytical data confirms the hydrocarbon concentrations from S WALL W SIDE @ 18' are very limited and defined within the 18 feet bgs zone and are not migrating vertically or laterally. Additional soil sampling or remediation is not reasonable or necessary due to this impact being isolated if present at all. Continued monitoring of groundwater at the site will continue until compliance with COGCC Table 910-1 can be demonstrated.

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

Signed: Scott Ghan

Title: Senior EHS Specialist

Submit Date: 04/17/2020

Email: sghan@grizzlyenergyllc.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: 05/05/2020

Remediation Project Number: 14050

COA Type**Description**

	This remediation project will not be eligible for closure with documented TPH impacts to soil at depth. Operator shall demonstrate compliance of TPH impacted areas (E. Floor @ 26' and S. Wall W. Side @ 18') via a Supplemental eForm 27.
	Operator shall provide results for groundwater sampling via quarterly project updates to be submitted on a Supplemental eForm 27. In addition to groundwater sampling results, the operator shall report gauge and report depths to groundwater.

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**

402260331	FORM 27-SUPPLEMENTAL-SUBMITTED
402262490	ANALYTICAL RESULTS
402262491	ANALYTICAL RESULTS
402301588	ANALYTICAL RESULTS
402351226	LOGS
402351242	MAP
402351417	LOGS

Total Attach: 7 Files

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

Environmental	Under Source Removal Summary, operator states that residual TPH impacts in soil at the S. Wall W. Side @ 18' location (1,460 mg/kg, doc #402149527) "have been remediated through aeration during the open excavation and natural attenuation," as suggested by analytical results for samples collected from SB-07. Under Operator Comment, operator states that the same impacts "are very limited and defined within the 18 feet bgs zone and are not migrating vertically or laterally." The operators F27 does not describe any means to verify or monitor the effectiveness of remediation of residual TPH impacts in soil in this location.	05/05/2020
Environmental	Under Remediation Summary, operator states that residual TPH impacts in soil at the E. Floor @ 26' sample location have been delineated horizontally and vertically. The operator's F27 does not describe any means to remediate or monitor residual TPH impacts in soil (2,230 mg/kg, doc #402149527) in this location.	05/05/2020

Total: 2 comment(s)