

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109



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Report taken by:
Candice (Nikki) Graber

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: GREAT WESTERN OPERATING COMPANY LLC	Operator No: 10110	Phone Numbers
Address: 1001 17TH STREET #2000		Phone: (720) 595-2132
City: DENVER	State: CO	Zip: 80202
Contact Person: Jason Davidson	Email: jdavidson@gwp.com	Mobile: ()

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 17902 Initial Form 27 Document #: 402674196

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: TANK BATTERY	Facility ID: 463941	API #: _____	County Name: WELD
Facility Name: Kielian 2-2 battery	Latitude: 40.335184	Longitude: -104.850155	
** correct Lat/Long if needed: Latitude: 40.335184		Longitude: -104.850155	
QtrQtr: SESE	Sec: 2	Twp: 4N	Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GM Most Sensitive Adjacent Land Use Residential
 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? Yes

Other Potential Receptors within 1/4 mile

The Kielian 2-2 battery is surrounded by private ranching and agricultural mixed-use properties in all directions. There are residential properties ~400' west and ~300' southeast. The wellhead is located ~250' northwest of the battery. A small pond is in place ~60' west of the battery and a gravel pit is in place ~600' east. The Thompson and Platte Ditch is in place ~1,180' south of the battery. There is 1 groundwater well mapped within a 1/4 mile of the battery. Groundwater depth is unknown but is expected to be encountered at <20' bgs. The 100-year floodplain of the Big Thompson River drainage is mapped ~260' north of the battery. The battery is located within a Mule Deer Severe Winter Range Buffer and an Aquatic Native Species Conservation Waters buffer is mapped ~1,050' northwest of the battery.

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
UNDETERMINED	GROUNDWATER	Area surrounding MW-1	Site Investigation Activities
Yes	SOILS	50' E/W x 65' N/S x 7' deep	Site Investigation Activities

INITIAL ACTION SUMMARY

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

During facility closure activities, soil and potential groundwater impacts were observed in test pits advanced to groundwater below the partially buried produced water tank and below the horizontal separator on May 5, 2021.

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):

[Empty text box for soil sampling details]

Proposed Groundwater Sampling

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

The next quarterly groundwater sampling event is scheduled for late-May 2022.

Proposed Surface Water Sampling

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

[Empty text box for surface water sampling details]

Additional Investigative Actions

Additional alternative investigative actions described in attached Site Investigation Plan (summary):

[Empty text box for additional investigative actions]

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 2
Number of soil samples exceeding 915-1 1
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 3250

NA / ND

-- Highest concentration of TPH (mg/kg) 0.968
NA Highest concentration of SAR
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 7

Groundwater

Number of groundwater samples collected 9
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 6'
Number of groundwater monitoring wells installed 9
Number of groundwater samples exceeding 915-1 0

-- Highest concentration of Benzene (µg/l) 4.75
ND Highest concentration of Toluene (µg/l)
-- Highest concentration of Ethylbenzene (µg/l) 8.56
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 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?

Please refer to the attached Site Characterization Workplan for a discussion of the background sampling activities conducted at the Site.

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.

Great Western will either dig and haul impacted soils to a commercial landfill or treat impacted soils above COGCC Table 915-1 concentration levels onsite.

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.

A remediation or closure plan will be developed following the fourth quarter 2022 groundwater monitoring event, scheduled to occur in November 2022.

Soil Remediation Summary

In Situ

Ex Situ

 Bioremediation (or enhanced bioremediation)

 Excavate and offsite disposal

Chemical oxidation
 Air sparge / Soil vapor extraction
 Natural Attenuation
 Other _____

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.

On February 10, 2022, groundwater monitoring was conducted in monitoring wells MW01 through MW09. Monitoring wells MW07 through MW09 were developed by purging at least 10 casing volumes. Prior to purging, depth to water measurements were collected in all nine monitoring wells using an oil water interface probe to determine relative groundwater elevations and calculate well specific target purge volumes. No free product was observed in any of the monitoring wells. After purging at least three casing volumes from monitoring wells MW01 through MW06 and following development activities at MW07 through MW09, each monitoring well was sampled using a peristaltic pump. Groundwater samples were collected into laboratory provided containers, placed on ice, and delivered with a completed chain-of-custody form to Origins Laboratory (Origins) in Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, and naphthalene by EPA Method 8260D.

During the February 2022 groundwater monitoring event, depth to groundwater ranged from approximately 5.20 feet below ground surface (ft bgs) in monitoring well MW04 to 9.44 ft-bgs in monitoring well MW01. Groundwater was calculated to flow north-northeast with an average hydraulic gradient of 0.0036 feet of vertical rise per foot of horizontal run as measured from well MW01 to well MW02.

All groundwater analytical results were reported at concentrations either below their respective COGCC Table 915-1 groundwater standards or below their respective laboratory reporting limits. The groundwater analytical results and relative groundwater elevations are summarized in Table 2 and displayed on Figure 1, which are included as attachments. The laboratory analytical report is also attached.

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? No

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.

If necessary, the site will be reclaimed in accordance with COGCC 1000-Series Rules.

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 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. 04/13/2021

Actual Spill or Release date, or date of discovery. 05/05/2021

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/30/2021

Proposed site investigation commencement. 08/16/2021

Proposed completion of site investigation. 01/20/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 04/03/2023

Proposed date of completion of Remediation. 04/28/2023

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

On January 20, 2022, three additional monitoring wells (MW07 through MW09) were installed at the Site using a direct push drilling rig operated by Site Services Drilling, LLC, with oversight by Entrada Consulting Group. A notice of intent to construct monitoring wells was submitted to the Colorado Division of Water Resources. The wells were constructed of 1-inch diameter PVC casing and installed to a total depth of 12 ft-bgs with 10 feet of 0.010-inch slotted screen extending from total depth. At each soil boring, an Entrada geologist observed the recovered soil, recorded lithology descriptions, and noted any potential evidence of petroleum hydrocarbon impact such as staining, odor, and elevated PID readings. The locations of the monitoring wells are shown on the attached Figure 1. The soil boring lithology logs and well construction diagrams are attached.

Two soil samples (MW07-5 and MW09-5) were collected from monitoring wells MW07 and MW09, respectively. A soil sample was not collected from monitoring well MW08 because it was located at a prior sample location (SB02-6.5). The soil samples were submitted to Origins, for analysis by COGCC approved methods of TPH (total volatile [C6-C10] and extractable [C10-C40] hydrocarbons), BTEX, 1,2,4-TMB, 1,3,5-TMB, acenaphthene, anthracene, chrysene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and pyrene. Laboratory analytical results indicated that soil sample MW09-5 had concentrations of benzene (0.00304 mg/kg), 1,2,4-TMB (0.189 mg/kg), and 1,3,5-TMB (0.0331 mg/kg) above the applicable COGCC Table 915-1 Protection of Groundwater Soil Screening Levels (GWSSLs). All remaining soil analytical results were compliant with Table 915-1 GWSSLs. The soil analytical results are summarized in Table 1 and full details of the analysis are provided in the laboratory analytical report, which are both included as attachments.

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

Signed: Jason Davidson

Title: Senior EHS Specialist

Submit Date: 04/04/2022

Email: jdavidson@gwp.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: Candice (Nikki) Graber

Date: 04/18/2022

Remediation Project Number: 17902

Condition of Approval

COA Type

Description

	Based on analytical provided previously and implementation schedule, COGCC does not approve waiting until November 2022 to initiate remediation. In accordance with 913.d.(1) Operator will investigate impacts to soil, Groundwater, and surface water as soon as the impacts are discovered.
1 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

402996118	FORM 27-SUPPLEMENTAL-SUBMITTED
402996136	LOGS
402996138	OTHER
402996139	GROUND WATER ELEVATION MAP
402996140	ANALYTICAL RESULTS
402996141	ANALYTICAL RESULTS
402996143	ANALYTICAL RESULTS
402996145	ANALYTICAL RESULTS
403000655	SITE INVESTIGATION REPORT

Total Attach: 9 Files

General Comments

User Group

Comment

Comment Date

Environmental	All previous COAs apply.	04/18/2022
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Total: 1 comment(s)