

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:

RICK ALLISON

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: <u>GREAT WESTERN OPERATING COMPANY LLC</u>	Operator No: <u>10110</u>	Phone Numbers
Address: <u>1001 17TH STREET #2000</u>		Phone: <u>(720) 595-2078</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80202</u>
Contact Person: <u>Ben Huggins</u>	Email: <u>bhuggins@gwogco.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 11294Initial Form 27 Document #: 401623783

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 type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation | <input checked="" 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

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

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>454672</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Pierce Unit 2 flowline 23SWSW</u>		Latitude: <u>40.641880</u>	Longitude: <u>-104.751510</u>
		** correct Lat/Long if needed: Latitude: <u>40.645499</u>	Longitude: <u>-104.751450</u>
QtrQtr: <u>SWSW</u>	Sec: <u>23</u>	Twp: <u>8N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>
Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>455020</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Historic Priddy 1</u>		Latitude: <u>40.645498</u>	Longitude: <u>-104.751295</u>
		** correct Lat/Long if needed: Latitude: <u>40.645462</u>	Longitude: <u>-104.751310</u>
QtrQtr: <u>NWNW</u>	Sec: <u>23</u>	Twp: <u>8N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications CLMost Sensitive Adjacent Land Use Pasture and agriculturalIs domestic water well within 1/4 mile? YesIs surface water within 1/4 mile? YesIs groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

Rural residential properties.

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 checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | |
| <input checked="" type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input 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
No	GROUNDWATER	None	Subsurface Invest.
Yes	SOILS	46x37	Subsurface Invest.

INITIAL ACTION SUMMARY

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

Recent Release:

The flowline was shut-in and excavation work was initiated on 3/30/18. approximately 57 cubic yards (yd3) of soil had been excavated from the flowline release location. Non-impacted topsoil was used to build an earthen berm around the excavation and hydrocarbon-impacted soil was stockpiled within the berm. Olsson Associates (Olsson) collected soil samples from the stockpiled soil, the base of the excavation beneath the flowline at a depth of 6 feet bgs, and from the sidewalls of the excavation at depths of 4 feet to 4.5 feet bgs. Origins Laboratory in Denver, CO analyzed the soil samples for analysis of benzene, toluene, ethylbenzene, and total xylene (BTEX), gasoline range organics (GRO), and diesel range organics (DRO) to compare to the COGCC Table 910-1 concentration levels. One additional soil sample was collected on 4/23/18 during excavation and flowline repair activities. The sample was collected from 11 feet bgs from a pothole in the base of the excavation, between the north sidewall and north flowline. Approximately 46 cubic yards of hydrocarbon-impacted soil were hauled offsite on 4/24/18 to Waste Management's North Weld Landfill in Ault, Colorado for proper disposal under GWOC waste manifests. Copies of the manifests are attached. The recent release was delineated both vertically and laterally during the limited subsurface investigation on 5/9/18 and groundwater was not encountered.

Historic Release:

A potential historic, buried pit was discovered on 5/9/18 during drilling associated with the limited subsurface investigation of the recent flowline release. Excavation activities conducted on 5/25/18 confirmed the existence of the pit. The historic pit was not fully 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):

To address the recent flowline release, the operator excavated hydrocarbon-impacted soil in the source area and collected nine (9) confirmation/closure soil samples from the sidewalls and base of the excavation. To address the historic pit, the operator excavated the gray hydrocarbon-stained material in the source area and around soil boring BH08 to remove impacts. All confirmation/closure soil samples were analyzed for BTEX, GRO, and DRO. See attached Figure 4.

Proposed Groundwater Sampling

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

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 9

Number of soil samples exceeding 910-1 0

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 1702

NA / ND

-- Highest concentration of TPH (mg/kg) 108

NA Highest concentration of SAR

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 10

Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet)

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 910-1 0

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)

Surface Water

0 Number of surface water samples collected

0 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?

☒ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) 283

Volume of liquid waste (barrels) 0

☐ Is further site investigation required?

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.

Hydrocarbon-impacted soil was excavated and hauled offsite to Waste Management's North Weld Landfill in Ault, Colorado for proper disposal under GWOC waste manifests. Approximately 103 cubic yards were disposed of on 5/25/18 and approximately 134 cubic yards were disposed of on 5/31/18. Copies of the manifests are attached.

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.

On 5/25/18 and 5/31/18, hydrocarbon-impacted soil associated with the recent flowline release and with the historic pit was excavated from beneath the flowlines, from the areas to the north, south, east, and west of the flowlines, and from around soil boring BH08 to a depth of approximately 10.5 feet bgs. The final extent of the excavation measured approximately 37 feet by 46 feet at the surface and approximately 237 cubic yards of hydrocarbon-impacted soil and waste were hauled off site under GWOC manifest. The approximate excavation perimeter is illustrated on Figure 4. Olsson collected nine confirmation/closure soil samples from the sidewalls and base of the final excavation extent for laboratory analysis of BTEX, GRO, and DRO. Concentrations of BTEX, GRO, and DRO in the nine confirmation/closure soil samples were either not detected at or above laboratory reporting limits or were reported below COGCC Table 910-1 concentration levels. The soil sample locations and analytical results are illustrated on Figure 4 and summarized on Table 3. Remediation is complete, and this Form 27 serves as a final closure request for Remediation Project #11294.

Soil Remediation Summary

☐ In Situ

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

☒ Ex Situ

Yes _____ Excavate and offsite disposal
If Yes: Estimated Volume (Cubic Yards) _____ 237
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

☐ _____ 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.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Closure Report is attached.

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:

None

Volume of E&P Waste (solid) in cubic yards 283

E&P waste (solid) description Hydrocarbon-impacted soil.

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Landfill

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? Yes _____

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

Does the previous reply indicate consideration of background concentrations? No _____

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? Yes _____

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.

On 6/4/18 the top 1 foot of the excavation was backfilled with clean topsoil and regraded to match pre-existing conditions. For the interim, GWOC plans to crimp straw over the disturbed area until the Fall 2018 when final reclamation will occur in accordance with COGCC Rule 1004 and surface owner requirements.

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. 03/23/2018

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/30/2018

Date of commencement of Site Investigation. 05/09/2018

Date of completion of Site Investigation. 05/25/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 05/25/2018

Date of completion of Remediation. 05/31/2018

SITE RECLAMATION DATES

Date of commencement of Reclamation. 06/04/2018

Date of completion of Reclamation. _____

OPERATOR COMMENT

Approximately 46 cubic yards were disposed of on 4/24/18, approximately 103 cubic yards were disposed of on 5/25/18, and approximately 134 cubic yards were disposed of on 5/31/18 for a total of 283 cubic yards.

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 Geologist

Submit Date: 07/30/2018

Email: jdavidson@olssonassociates.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: RICK ALLISON

Date: 10/10/2018

Remediation Project Number: 11294

COA Type**Description**

	Based on the information presented, it appears that impacts related to the flowline release have been removed. Impacts are present within a historical reserve pit associated with the Priddy 1, which was plugged and abandoned in 1979. Those impacts appear defined by the data presented with no apparent threat for vertical migration to groundwater. Therefore, 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. In addition, the surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.
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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**

401659640	FORM 27-SUPPLEMENTAL-SUBMITTED
401719439	REMEDATION PROGRESS REPORT

Total Attach: 2 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)