

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:  
402359759  
Receive Date:  
04/03/2020  
Report taken by:  
Kari Oakman

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

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 14436 Initial Form 27 Document #: 402212421

**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 checked="" 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 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**      N      Multiple Facilities ( in accordance with Rule 909.c. )

Facility Type: LOCATION	Facility ID: 320313	API #: _____	County Name: ADAMS
Facility Name: NORTH YORK-61S68W 12NWSW	Latitude: 39.977350	Longitude: -104.957217	
** correct Lat/Long if needed: Latitude: 39.977193		Longitude: -104.956918	
QtrQtr: NWSW	Sec: 12	Twp: 1S	Range: 68W      Meridian: 6      Sensitive Area? Yes

**SITE CONDITIONS**

General soil type - USCS Classifications SC      Most Sensitive Adjacent Land Use Big Dry Creek is located 300 feet to the west.

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**

Residential neighborhood in place 840 feet to the north.

# 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 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	Not impacted	Grab groundwater sampling
No	SOILS	Excavated	Confirmation 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.

Five discreet confirmation soil samples were collected on 10/17/19 (4 wall and 1 base) from the produced water tank excavation, which measured approximately 20 feet by 20 feet by 5 feet deep. The base and wall sample from the south wall were analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbon (TPH)- gasoline range organics (GRO), and TPH- diesel range organics (DRO). In addition, the base sample was analyzed for pH, Electrical Conductivity (EC), and Sodium Absorption Ratio (SAR). Concentrations of BTEX, naphthalene, TPH-GRO, and TPH-DRO were either not reported at or above laboratory detection limits or were reported below their respective COGCC Table 910-1 concentration levels. Concentrations of TPH-GRO and TPH-DRO were added to calculate TPH. TPH concentrations were reported at 362 milligrams per kilogram (mg/kg) and 290 mg/kg, which are below the Table 910-1 concentration level of 500 mg/kg. The results for pH, EC, and SAR associated with the base sample were reported within their respective Table 910-1 concentration ranges. Groundwater was encountered at the base of the excavation at approximately 5 feet below ground surface (bgs). One grab groundwater sample was collected from the excavation using a new disposable polyethylene bailer and nylon cord and analyzed for BTEX. Benzene concentrations were reported at 16.0 micrograms per liter (ug/L), which is above the Table 910-1 concentration level of 5.0 ug/L. All other analytes were reported at concentrations below their respective Table 910-1 concentration levels. The excavation cavity was backfilled with the material that was initially excavated.

## 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 ):

### 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) 0

### NA / ND

-- Highest concentration of TPH (mg/kg) 108  
NA Highest concentration of SAR           
BTEX > 910-1 No  
Vertical Extent > 910-1 (in feet) 0

### Groundwater

Number of groundwater samples collected 1  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 5'  
Number of groundwater monitoring wells installed 0  
Number of groundwater samples exceeding 910-1 0

ND Highest concentration of Benzene (µg/l)           
ND Highest concentration of Toluene (µg/l)           
ND Highest concentration of Ethylbenzene (µg/l)           
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 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)               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.

On 3/6/20, approximately 150 cubic yards of hydrocarbon-impacted soil and 40 barrels of groundwater were removed from the excavation and hauled offsite for proper disposal under GWOC waste manifests. Copies of the waste manifests will be provided in a subsequent Form 27.

## 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.

Remediation activities beneath the former produced water tanks commenced on 3/6/20. Source removal by excavation was conducted, based on visual and olfactory observations, field soil screening, and laboratory analysis. The excavation measured approximately 50 feet by 43 feet and was approximately 6 feet to 7 feet deep. Groundwater infiltrated the excavation at approximately 5 feet bgs. Three excavation confirmation soil samples (one base and two sidewall) were collected and submitted for laboratory analysis for BTEX, TPH-GRO and TPH-DRO. Concentrations of BTEX, TPH-GRO, and TPH-DRO were either not reported at or above laboratory detection limits or were reported below their respective Table 910-1 concentration levels in all three confirmation soil samples collected. Hydrocarbon-impacted soil was not observed along the north and east walls of the excavation. Following the completion of remediation activities, one groundwater sample (GW-2) was collected from the base of the excavation, in the same location as sample NorthYorkGW, collected on 10/17/19. The sample was collected using a new disposable polyethylene bailer and nylon cord and analyzed for BTEX. Concentrations of BTEX were not detected above laboratory reporting limits. A copy of the laboratory report is attached. Refer to the attached Figure 4 for an illustration of the approximate excavation perimeter, confirmation soil and groundwater sample locations, and analytical results. The analytical results are also summarized on the attached Table 1.

## Soil Remediation Summary

In Situ

Ex Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

Yes \_\_\_\_\_ Excavate and offsite disposal

\_\_\_\_\_ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 150

\_\_\_\_\_ 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

\_\_\_\_\_ 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.

Groundwater was not impacted.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

**Frequency:**  Quarterly  Semi-Annually  Annually  Other Remediation Progress Report

**Report Type:**  Groundwater Monitoring  Land Treatment Progress Report  O&M Report

Other Closure Request

## 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 150

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Waste Management's Buffalo Ridge  
Landfill in Keenesburg, CO

Volume of E&P Waste (liquid) in barrels 40

E&P waste (liquid) description Groundwater

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Expedition Water Services Injection  
Well EWS#6

## 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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

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.

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 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. 10/24/2019

Actual Spill or Release date, if known. \_\_\_\_\_

## SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/17/2019

Date of commencement of Site Investigation. 10/17/2019

Date of completion of Site Investigation. 10/17/2019

## REMEDIAL ACTION DATES

Date of commencement of Remediation. 03/06/2020

Date of completion of Remediation. 03/06/2020

## SITE RECLAMATION DATES

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

## OPERATOR COMMENT

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: 04/03/2020

Email: j davidson@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: Kari Oakman

Date: 04/13/2020

Remediation Project Number: 14436

## COA Type

## Description

	Request for closure removed - Groundwater was removed prior to proper characterization. Due to the limited site investigation, Operator shall install monitoring wells to properly characterize groundwater and sample for BTEX. If the samples are below the laboratory detection limits COGCC shall consider a No Further Action request. If any impacts are detected, four quarters of monitoring shall be required.
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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.

<u>Att Doc Num</u>	<u>Name</u>
402359759	FORM 27-SUPPLEMENTAL-SUBMITTED
402361226	SOIL SAMPLE LOCATION MAP
402361227	ANALYTICAL RESULTS
402361228	ANALYTICAL RESULTS

Total Attach: 4 Files

## General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)