

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

Report taken by:

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 Phone: (720) 595-2132 Mobile: ()
Address: 1001 17TH STREET #2000		
City: DENVER	State: CO Zip: 80202	
Contact Person: Jason Davidson	Email: jdavidson@gwp.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 17652 Initial Form 27 Document #: 402652459

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: WELL	Facility ID: _____	API #: 123-12952	County Name: WELD
Facility Name: PIERCE UNIT-KENNEDY 3		Latitude: 40.631210	Longitude: -104.765830
		** correct Lat/Long if needed: Latitude: 40.631210	Longitude: -104.765830
QtrQtr: NESW	Sec: 27	Twp: 8N	Range: 66W Meridian: 6 Sensitive Area? No

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Agricultural

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

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

The Pierce Unit Kennedy #3 wellhead is surrounded by agricultural fields in all directions. Residences are located approximately 750 feet to the east. There are no groundwater well permits mapped within ¼ mile of the wellhead. Based on monitoring activities at the Pierce Central Battery 5,100 feet to the northeast, groundwater is expected to be encountered between 25 feet and 26 feet below ground surface. The wellhead is situated in a quarter-quarter section within 1,000 feet of a Type III Well Location. There are no additional sensitive areas or wildlife habitats identified within a quarter mile of the wellhead.

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	SOILS	23' x 18' x 7' deep - 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.

Great Western proposes to conduct closure of the Pierce Unit Kennedy #3 wellhead. Plugging and abandonment of the well will commence on 4/14/2021 and will be completed by 4/16/2021. Cut and cap activities are planned to commence and be completed on 4/22/2021. The off-location flowline will be left in place as it shared with Great Western's Jennings #1 well. Therefore, there are no Form 44s related to this P&A. The tank battery, which is located approximately 5,100 feet to the northeast of the wellhead, will remain in place. Great Western will conduct site investigation activities, field screening, and confirmation soil sampling activities during closure in accordance with COGCC 900 Series Rules. Discreet soil samples and, if necessary one groundwater sample, will be collected and analyzed pursuant to Rule 915, following the general sample collection guidance in Rule 915.e.(2) and Rule 915.e.(3). All waste generated during the closure activities will be managed and disposed of at Waste Management's North Weld Landfill in Ault, Colorado in accordance with Rules 905 and 906.

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):

Up to five discreet soil samples will be collected for field screening. At least one of the field screening samples will be submitted to an accredited laboratory for analysis. Soil samples will be analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and Total Volatile Petroleum Hydrocarbons (TVPH [C6-C10]) by EPA Method 8260 and Total Extractable Petroleum Hydrocarbons (TEPH [C10-C36]) by EPA Method 8015. Analytical results for TVPH and TEPH will be added together to calculate Total Petroleum Hydrocarbons (TPH).

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 915-1 9

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

Approximate areal extent (square feet) 150

NA / ND

NA Highest concentration of TPH (mg/kg)

-- Highest concentration of SAR 9.24

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 8

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

Number of groundwater samples exceeding 915-1

Highest concentration of Benzene (µg/l)

Highest concentration of Toluene (µg/l)

Highest concentration of Ethylbenzene (µg/l)

Highest concentration of Xylene (µg/l)

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 Operator Comments under the Submit tab of this Form 27 for a discussion of the background soil sampling activities conducted at the Site.

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

Volume of solid waste (cubic yards) 89

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? No

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Please refer to the Operator Comments section of the COGCC approved Form 27 Supplemental Document #402786820 for a discussion of the source removal activities conducted at the Site.

REMEDIAL ACTION 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.

Source removal excavation and associated confirmation soil sample laboratory analytical results indicate no further remediation is currently necessary.

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) _____ 89
_____ 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.

Groundwater was not encountered during site investigation activities.

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 Site Investigation Report

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:

Volume of E&P Waste (solid) in cubic yards 89

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Waste Management's Nort Weld Landfill in Ault, CO

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

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? No

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards? Yes

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.

Great Western has conducted vertical and lateral delineation activities for Sodium Adsorption Ratio (SAR) at the Site. The soil suitability for reclamation parameters; electrical conductivity (EC), pH, and boron were not reported above COGCC Table 915-1 concentration levels during initial facility closure activities. Therefore, delineation of EC, pH, and boron was not necessary. Delineation activities included the analysis of background samples collected from adjacent undisturbed lands. Please refer to the Operator Comments section under the Submit tab of this Form 27 for a discussion of the SAR delineation activities conducted at the Site on October 13, 2021.

Great Western will conduct final reclamation of the land and soil at the wellhead in accordance with COGCC 1000-Series Rules. The wellhead excavation has been backfilled, the disturbed area has been reclaimed as nearly as practical to its original contours (relatively flat), and soil horizons have been replaced in their original relative positions. All debris, waste material, and equipment associated with the wellhead and pumpjack will be removed from the Site. The area around the wellhead will be cross-ripped and the land will be adequately tilled to re-establish a proper seedbed and stabilized to minimize erosion. Great Western will also apply topsoil and compost, as needed. The landowner will reincorporate the area into the agricultural field and plant corn in the Spring 2022. Inspections will take place periodically in accordance with COGCC and Colorado Department of Public Health and Environment (CDPHE) requirements. The site will be monitored to identify areas of poor growth and the presence of noxious weeds.

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? No

If YES, does the seed mix comply with local soil conservation district recommendations? _____

Did the local soil conservation district provide the seed mix? No

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 05/31/2021

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. 03/23/2021

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/26/2021

Proposed site investigation commencement. 09/07/2021

Proposed completion of site investigation. 10/13/2021

REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/27/2021

Proposed date of completion of Remediation. 05/27/2021

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

In accordance with the COGCC approved Form 27 Supplemental Document #402786820, additional confirmation soil samples were collected at the Site on October 13, 2021, to vertically and laterally delineate potential arsenic, selenium, and Sodium Adsorption Ratio (SAR) impacts. Using a track mounted Geoprobe direct push drilling rig, soil samples were collected from boring SS1 at 9 feet to 10 feet below ground surface (ft-bgs), and from boring SS3 at 1 ft-bgs, 5 ft-bgs, 7 ft-bgs, and 9 ft-bgs. Two step-out borings (SS6 and SS7) were advanced at locations northwest and southwest of boring SS3, and confirmation samples were collected from each boring at 1 ft-bgs and 3 ft-bgs. Additionally, two background soil borings (BG3 and BG4) were advanced at the western edge of the pad away from oil and gas infrastructure. Samples were collected from each boring at 5 ft-bgs and 10 ft-bgs. All samples were submitted to Origins Laboratory, Inc. (Origins) in Denver, Colorado for analysis of arsenic, selenium, and SAR by COGCC approved methods.

SAR was reported at 9.24 units in soil sample SS3-7, collected at 7 ft-bgs, which is above the COGCC Table 915-1 standard of 6 units. SAR was reported at 3.62 units in soil sample SS3-9, collected from the same boring at 9 ft-bgs, which successfully vertically delineates elevated SAR at the Site. All other samples submitted for SAR analysis were compliant with the applicable Table 915-1 standard, which successfully laterally delineates elevated SAR at the Site.

Arsenic concentrations were reported above the Table 915-1 Protection of Groundwater Soil Screening Level (GWSSL) of 0.29 milligrams per kilogram (mg/kg) in all confirmation and background soil samples submitted for analysis. The average arsenic concentration in the confirmation soil samples is 3.05 mg/kg, compared to the maximum background arsenic concentration of 3.37 mg/kg. Selenium concentrations were reported above the Table 915-1 GWSSL of 0.26 mg/kg in confirmation soil samples SS3-1, SS3-5, SS6-1, SS6-3, SS7-1 and SS7-3. The average selenium concentration in confirmation soil samples is 0.320 mg/kg, compared to the maximum background concentration of 0.307 mg/kg. Concentrations of arsenic and selenium reported for the confirmation and background soil samples are also representative of published USGS C-horizon arsenic and selenium background concentrations for this location of 5.7 mg/kg to 6.7 mg/kg for arsenic, and 0.3 mg/kg to 0.4 mg/kg for selenium. Based on the analytical and USGS map data, Great Western believes that detected concentrations of arsenic and selenium are representative of naturally occurring local background concentrations.

Initial soil sample and field screening locations are presented on Figure 2, and SAR delineation results are presented on Figure 3. USGS arsenic and selenium background concentration maps are presented on Figure 4 and Figure 5, respectively. Analytical results are presented in Table 1 and Table 2. Sample location information is provided in Table 3. A copy of the laboratory analytical reports are also attached.

Great Western Operating Company respectfully requests that the COGCC grant closure for the Pierce Unit Kennedy #3 Wellhead, Remediation Project #17652.

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:

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:

Date:

Remediation Project Number: 17652

COA Type

Description

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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

402885566	SOIL SAMPLE LOCATION MAP
402885570	SOIL SAMPLE LOCATION MAP
402885571	MAP
402885572	MAP
402885573	ANALYTICAL RESULTS
402885574	ANALYTICAL RESULTS
402885575	ANALYTICAL RESULTS
402885576	OTHER

Total Attach: 8 Files

General Comments

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

Total: 0 comment(s)