

State of Colorado
Energy & Carbon Management 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: WESTERN OPERATING COMPANY	Operator No: 95620	Phone Numbers
Address: 1165 DELAWARE STREET #200		Phone: (303) 726-8650
City: DENVER State: CO Zip: 80204		Mobile: ()
Contact Person: Steve James	Email: steve@westernoperating.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 24450 Initial Form 27 Document #: 403090399

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

Yes Multiple Facilities

Facility Type: WELL	Facility ID: _____	API #: 087-08147	County Name: MORGAN
Facility Name: GLENN STATE 4-36	Latitude: 40.099240	Longitude: -103.826710	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWNW	Sec: 36	Twp: 2N	Range: 58W Meridian: 6 Sensitive Area? No

Facility Type: LOCATION	Facility ID: 313967	API #: _____	County Name: MORGAN
Facility Name: GLENN STATE-62N58W 36NWNW	Latitude: 40.099240	Longitude: -103.826710	
** correct Lat/Long if needed: Latitude: 40.099736		Longitude: -103.826401	
QtrQtr: NWNW	Sec: 36	Twp: 2N	Range: 58W Meridian: 6 Sensitive Area? No

Facility Type: OFF-LOCATION FLOWLINE	Facility ID: 482360	API #:	County Name: MORGAN
Facility Name: Wellhead Line 36NWNW	Latitude: 40.099669	Longitude: -103.826748	
** correct Lat/Long if needed: Latitude:		Longitude:	
QtrQtr: NWNW	Sec: 36	Twp: 2N	Range: 58W 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

The Glenn State 4-36 wellhead is surrounded by vacant land in all directions. There are no residences within a quarter mile of the wellhead. There are no groundwater well permits mapped within a quarter mile of the wellhead. Groundwater depth is unknown, but groundwater permit 147107 approximately 0.36 miles northeast of the wellhead, reported a static water level of 38.5 feet below ground surface (ft-bgs) at the time of completion. There is an unnamed ephemeral drainage mapped approximately 0.16 miles north of the site. There are no additional sensitive areas or wildlife habitats identified within a quarter mile of the wellhead.

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 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	5ft x 5ft x 7ft deep	Analytical Results

INITIAL ACTION SUMMARY

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

Western Operating proposes to plug and abandon (P&A) the Glenn State 4-36 well and remove the production facility equipment. Plugging and abandonment of the well will occur in Summer 2022. Cut and cap and production facility removal activities are planned to commence and be completed approximately 10 days after P&A activities are complete. Western Operating 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 in accordance with Rules 905 and 906. See the attached Figure 1 for an illustration of the location of the Site.

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):

A minimum of 16 discreet soil samples will be collected for field screening. At least seven of the samples will be submitted to an accredited laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and Gasoline Range Organics (GRO) [C6-C10] by EPA Method 8260 and for Diesel Range Organics (DRO) [C10-C28] and Residual Range Organics (RRO) [C28-C40] by EPA Method 8015. Analytical results for GRO, DRO, and RRO will be added together to calculate Total Petroleum Hydrocarbons (TPH). One wellhead sidewall sample and one produced water tank floor sample will be analyzed for the Soil Suitability for Reclamation parameters; Electrical Conductivity (EC), Sodium Absorption Ratio (SAR), pH by Saturated Paste Method, and boron by Hot Water-Soluble Soil Extract Method. See the attached Figure 2 for an illustration of proposed discreet soil sample locations for field screening and for laboratory analysis.

Proposed Groundwater Sampling

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

If groundwater is encountered during decommissioning activities, a grab sample will be collected as soon as practical. If contaminated soil is in contact with groundwater or if free product/hydrocarbon sheen are observed, the release will be reported in accordance with Rule 912.b. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260.

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):

Western Operating will remove the flowline by cutting it in 50' sections and pulling it from the subsurface. An estimated 1 discrete soil samples will be collected for field screening during flowline abandonment. If indications of soil impacts are present, the sample will be submitted to an accredited laboratory for analysis as discussed in the Proposed Soil Sampling section above. Samples collected from areas most likely to have been impacted during the operational life of the flowline, in accordance with COGCC Operator Guidance Rule 911.a.(4), will be submitted to an accredited laboratory for analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, TPH, EC, SAR, pH and boron.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 11
Number of soil samples exceeding 915-1 2
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 89

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 9.6
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 6

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
0 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?

Four background soil samples were collected from two sample locations undisturbed by oil and gas activities near the Glenn State 4-36 wellhead and production facility. Background analytical results demonstrate that SAR, pH, and arsenic concentrations exist naturally at this location above Table 915-1 allowable limits. Arsenic results were averaged for all background samples and multiplied by 1.25 to establish a baseline background concentration of 1.75 mg/kg.

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?

Additional investigation and background sampling will be conducted to determine if pH levels reported in confirmation soil samples EX01@7, EX02@3 and WH01-R@6 are representative of background levels.

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.

No organic compounds were detected through field-screening or laboratory analysis during the investigation. Arsenic and selenium were reported above the Table 915-1 standard in soil sample SEP01@3 collected from underneath the separator flowline riser. Approximately 3 cubic yards of soil were removed from around this location by excavation and transported to Pawnee Waste. SAR and pH were reported above Table 915-1 standards in soil sample BKG01. Approximately 4 cubic yards of soil were removed from BKG01 location and transported to Pawnee Waste, LLC for disposal.

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.

Based on site investigation activities and laboratory analytical results for confirmation soil samples collected from the Glenn State 4-36 wellhead and production facility, a remediation plan is not needed.

Soil Remediation Summary

In Situ

Ex Situ

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

Yes _____ Excavate and offsite disposal
If Yes: Estimated Volume (Cubic Yards) _____ 7
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.

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.

Following facility closure activities, the location will be backfilled, compacted, and re-contoured to match pre-existing conditions. The location was reclaimed in accordance with the COGCC 1000 series rules.

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. 10/01/2023

Proposed date of completion of Reclamation. 10/01/2024

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. _____

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

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 08/15/2022

Proposed site investigation commencement. 06/23/2023

Proposed completion of site investigation. _____

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/17/2023

Proposed date of completion of Remediation. 12/01/2023

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

This Form is being submitted as a quarterly update of ongoing activities at the Glenn State 4-36 location.

Facility closure activities and confirmation soil sampling at the Glenn State 4-36 wellhead and production facility occurred on June 23, August 17, and December 1, 2023. Four discrete soil samples were collected from the four sidewalls of the produced water vessel (PWV) and wellhead (WH01) excavations, and field screened using a photo-ionization detector (PID) calibrated with 100 parts per million (ppm) isobutylene gas. One discrete soil sample was field screened beneath the pumpjack motor (PJ01@0.5), and five soil samples were field screened from potholes to remove on-location flowlines and dumpline (FL01-FL05). All field screening PID readings were less than 4.1 ppm, and no visual or olfactory evidence of hydrocarbon impact was observed.

Soil sample AST01@3 was collected from underneath the flowline riser of the southern-most above ground storage tank (AST). Soil sample AST02@0.5 was collected beneath the access hatch of the northern-most AST. Soil samples SEP01@3 and SEP01@4.5 were collected from beneath former separator flowline risers. Soil samples were collected from the floor of the wellhead excavation (WH01@6), and sidewall adjacent to the former wellhead line riser (FLR01@3). Two soil samples, PWV01@5 and WDL01@3 were collected from the floor beneath the PWV, and sidewall beneath the former water dump line, respectively.

Per Condition of Approval (COA) issued under Form 27 Document number 403532278, excavation was conducted at BKG01 location to remove SAR and pH impacted soils, and confirmation soil samples EX01@7 and EX02@3 were collected to demonstrate compliance. Additionally, replacement samples WH01-R@6 and FLR01-R@3 were collected and submitted for remaining Table 915-1 analysis that was not included in initial samples WH01@6 and FLR01@3 to demonstrate no organic compounds, including PAHs, were detected in the area most likely to have been impacted during the life of this facility; the wellhead and its flowline riser. Additional investigation and background sampling will be conducted to determine if pH levels reported in confirmation soil samples EX01@7, EX02@3 and WH01-R@6 are representative of background levels.

The area identified east of the site in a COA issued under Form 27 Document number 403532278 is a topographic low spot where rain water from above-average spring rain accumulated and prevented normal vegetation growth over Summer 2023. This area does not represent an impacted salt kill. Based on a phone call with EPS Krystal Heibel and Kyle Waggoner on 10/25/2023, samples were not collected from this area, and photos were collected of the area. See photos 29 and 30 in the attached photolog.

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

Signed: Ryan Finley

Title: Senior Project Geologist

Submit Date: _____

Email: rfinley@entradainc.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: 24450

COA Type

Description

COA Type	Description
0 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

403675689	MAP
403675696	SOIL SAMPLE LOCATION MAP
403675700	ANALYTICAL RESULTS
403675702	ANALYTICAL RESULTS
403675704	PHOTO DOCUMENTATION

Total Attach: 5 Files

General Comments

User Group

Comment

Comment Date

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)