FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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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 INFORMATON

Name of Operator: GREAT WESTERN OPERATING COMPANY LLC Operator No: 10110
Address: 1801 BROADWAY #500
City: DENVER State: CO Zip: 80202
Contact Person: Ben Huggins

Phone Numbers
Phone: (303) 398-0478
Mobile: ( )
Email: bhuggins@gwogco.com

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 11194 Initial Form 27 Document #: 401599042

PURPOSE INFORMATION

- [ ] 901.e. Sensitive Area Determination
- [ ] 909.c.(1), Rule 905: Pit or PW vessel closure
- [ ] 909.c.(2), Rule 906: Spill/Release Remediation
- [ ] 909.c.(3), Rule 907.e.: Land treatment of oily waste
- [ ] 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure
- [ ] 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
- [ ] Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
- [x] Rule 909.e.(2)B.: Closure of remediation project
- [ ] Rule 906.c.: Director request
- [ ] Other

SITE INFORMATION

N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: LOCATION Facility ID: 322588 API #: County Name: WELD
Facility Name: WINDSOR INVESTMENT GROUP-66N67W 35SENW Latitude: 40.445373 Longitude: -104.863005
** correct Lat/Long if needed: Latitude: 40.445428 Longitude: -104.863422
QtrQtr: SENW Sec: 35 Twp: 6N Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SW
Most Sensitive Adjacent Land Use: Cache La Poudre River in place 150 feet southwest
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

None

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [x] **E&P Waste**
  - [x] Produced Water
  - [x] Oil
  - [ ] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	15' x 15' x 10' deep	Sampling during DD & excavation

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 due diligence on December 13, 2017, five direct push soil borings were advanced surrounding the tank battery berm to assess potential soil and groundwater petroleum hydrocarbon impacts. Soil impacts were discovered between the site entrance and the condensate tank berm. Excavation activities were conducted on April 4 and 5, 2018 to further investigate and remediate the impacted soil discovered during due diligence. Please refer to Figure 2 for an illustration of the laboratory analytical results from the December 13, 2017 due diligence and from the April 4 and 5, 2018 excavation/remediation.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

- [x] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

In addition to soil sampling conducted during due diligence on December 13, 2017, five confirmation grab soil samples were collected from the wall of the excavation on April 5, 2018 and analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), gasoline range organics (GRO), and diesel range organics (DRO). A copy of the laboratory report is attached. See the attached Figure 2 for sample locations, field screening, and analytical results.

Proposed Groundwater Sampling

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

Five groundwater samples were collected during due diligence on December 13, 2017 and analyzed for BTEX. Concentrations of BTEX were not detected above laboratory reporting limits in any of the samples collected. Groundwater samples were not collected during excavation activities on April 4 and 5, 2018.

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: 5

Number of soil samples exceeeding 910-1: 0

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

Approximate areal extent (square feet): 225

NA / ND

-- Highest concentration of TPH (mg/kg): 211

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): 9`

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): 84

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.

During excavation activities on April 4 and 5, 2018 a buried historic concrete vault, crushed and abandoned in place, was discovered. The vault, buried 4.5 feet below ground surface (bgs), is the suspected source of subsurface soil impacts in the area between the site entrance and the condensate tank berm. The vault debris and approximately 84 cubic yards of impacted soil were removed from the excavation and hauled offsite to North Weld Landfill in Ault, Colorado for proper disposal under Great Western Operating Company (GWOC) waste manifests. Copies of the waste 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.

The excavation measured approximately 15 feet by 15 feet at the base and was approximately 10 feet deep. Groundwater was encountered in the excavation at approximately 9 feet bgs. On April 5, 2018, 700 pounds of Chemically Oxygenated Granular Activated Carbon (COGAC™) were applied to the groundwater at the base of the excavation and thoroughly mixed in prior to backfill with clean overburden and imported material.

Soil Remediation Summary

☒ **In Situ**

- Yes — Bioremediation (or enhanced bioremediation)
- No — Chemical oxidation
- No — Air sparge / Soil vapor extraction
- No — Natural Attenuation
- ____ — Other ____

☒ **Ex Situ**

- Yes — Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) 84
  - 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.

Groundwater has not been impacted.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☐ Other _____

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? _____

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? 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.

If necessary, the site will be reclaimed in accordance with 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 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. 01/05/2018

Actual Spill or Release date, if known. 12/13/2017

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/13/2017

Date of commencement of Site Investigation. 04/04/2018

Date of completion of Site Investigation. 04/05/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 04/05/2018

Date of completion of Remediation. 04/05/2018

SITE RECLAMATION DATES

Date of commencement of Reclamation.

Date of completion of Reclamation.

OPERATOR COMMENT

During due diligence on December 13, 2017, soil sample WIG 35-1-BH01-10' was collected from the bottom 2 feet (8 feet to 10 feet bgs) of the Geoprobe's Dual Tube sampler that was driven from 5 feet to 10 feet bgs. During excavation activities to 10 feet bgs on April 4 and 5, 2018, the area where soil sample WIG 35-1-BH01-10' was collected was removed and disposed of offsite. Additionally, 700 pounds of COGAC™ were applied to the groundwater at the base of the excavation and thoroughly mixed in prior to backfill with clean overburden and imported material.

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:` 05/03/2018 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: 05/04/2018

Remediation Project Number: 11194

COA Type	Description
	Based on the information presented, it appears that 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.

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
401626926	FORM 27-SUPPLEMENTAL-SUBMITTED
401627132	ANALYTICAL RESULTS
401627136	DISPOSAL MANIFESTS
401629456	SOIL SAMPLE LOCATION MAP
401629468	ANALYTICAL RESULTS

Total Attach: 5 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)