

State of Colorado Oil and Gas Conservation Commission

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403120570

Receive Date:

03/08/2023

Report taken by:

Kyle Waggoner

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: <u>FOUNDATION ENERGY MANAGEMENT LLC</u>	Operator No: <u>10112</u>	Phone Numbers
Address: <u>5057 KELLER SPRINGS RD STE 650</u>		Phone: <u>(972) 707-2523</u>
City: <u>ADDISON</u>	State: <u>TX</u>	Zip: <u>75001</u>
Contact Person: <u>Afton Iiams</u>	Email: <u>aiiams@foundationenergy.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 11274 Initial Form 27 Document #: 401623219

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: Showers 5-4 Skim Tank Soil Suitability Assessment

SITE INFORMATION

No Multiple Facilities

Facility Type: <u>PIT</u>	Facility ID: <u>274748</u>	API #: <u></u>	County Name: <u>WELD</u>
Facility Name: <u>DOC SHOWERS</u>		Latitude: <u>40.611664</u>	Longitude: <u>-104.124194</u>
		** correct Lat/Long if needed: Latitude: <u></u>	Longitude: <u></u>
QtrQtr: <u>SWSW</u>	Sec: <u>32</u>	Twp: <u>8N</u>	Range: <u>60W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Rangeland

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

Is groundwater less than 20 feet below ground surface? No

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
No	SOILS	~1750 sq ft	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.

Foundation Energy Management (FEM) provided details of the initial actions in the former Pit and Skim Tank locations (Figure 1 and 2) in the COGCC approved Initial Form 27 (#401623219) document that was submitted on 4/27/2018 and subsequent Form 27-S documents, most recently # 402721018. Approximately 296 tons of impacted soil were removed and transported to the Waste Management Ault facility in 2018. Clean backfill was brought in to bring the former pit area to grade and the former pit location was reseeded. Based on follow up discussions between FEM and COGCC, additional investigative and confirmation sampling activities were completed in 2021 and 2022 and the data are presented within this Form 27S.

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):

In response to a COA in the Form 27S closure request (#401828226), submitted in March 2021, FEM performed a soil suitability assessment in the pit in the approximate former locations of SS07 – SS10 on 5/12/2021. Additional clean backfill was applied to the site during the 3Q21, and confirmation samples were collected on 9/30/2021, 5/17/2022, and 12/5/2022. Additionally, in response to a separate COA on Form 27-S #401828226, one sample was collected beneath the former skim tank location and analyzed for Table 915-1 soil suitability and organic parameters on 5/12/2021, and for EC and SAR on 5/17/2022. The soil sample results are summarized on Tables 1 and presented on Figure 3. Lab reports are included in Appendix A.

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):

The soil investigation described in this Form 27-S was prepared in response to COAs to the Form 27-S closure request #401828226. Based on the initial round of sampling, as well as three subsequent rounds of confirmation sampling, pH, SAR, and/or boron are above Table 915-1 standards at three sample locations in the pit area at depths of 1 to 2 feet below grounds surface (ft bgs). Confirmation samples collected from beneath the skim tank on 5/12/2021 and 5/17/2022 indicate that there are no remaining impacts associated with the skim tank.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 13

Number of soil samples exceeding 915-1 10

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 1750

NA / ND

ND Highest concentration of TPH (mg/kg)

-- Highest concentration of SAR 23

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 2

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?

A background sample (Background-ST1@2') was collected and analyzed for Table 915-1 organics and soil suitability parameters on 5/12/2021. The results of the background sample are presented on Table 1.

☐ 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?

The horizontal and vertical extents of organic contamination were delineated during a prior investigation and presented in Form 27-S #401828226, and samples on 5/12/2021 (reported in approved F27 #402721018) and 5/17/2022 indicate that impacts are not present beneath the skim tank. Based on the pit soil suitability assessment presented in this report, pH, SAR, and boron concentrations remain above Table 915-1 concentrations at three sample locations in the pit area.

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.

Soils exhibiting concentrations above Table 910-1 standards were previously removed and disposed of at Waste Management's Ault facility, a licensed disposal facility. A description of initial source removal was provided in the previously submitted Form 27 (#401828226) and remediation objectives were conditionally approved by the COGCC and the Site was assigned remediation #11274. The remediation of the Showers 5-4 pit was carried out in 2018. Approximately 296 tons of impacted material, including the pit berms, was encountered and removed with heavy equipment, then transported to Waste Management's Ault facility. Based on pH, SAR, and boron concentrations greater than Table 915-1 standards, additional remediation is likely required at this site, and a Form 27-S work plan will be submitted prior to remediation implementation.

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.

After approximately 296 tons of impacted material were removed from the pit, confirmation samples were collected at the excavation extents and sample results indicated that hydrocarbon impacts had been removed and the waste manifests were provided to the COGCC in previous F27S submittals. Soil samples collected from the surface at the time of the excavation and analyzed for inorganics showed exceedances for SAR, pH, and EC. Supplemental soil sampling performed in May 2021 showed that soil suitability impacts remained, and further remediation and confirmation sampling may be needed. During the 3Q21, additional clean backfill material was mixed into the pit area and additional soil suitability samples were collected on 9/30/2021. Sample locations with soil suitability concentrations greater than Table 915 were resampled on 5/17/2022 and 12/5/2022, and only pH, SAR, and boron remain at concentrations greater than Table 915 standards. Powdered gypsum was applied to the site during 2022 to reduce SAR, but soil confirmation results do not indicate that those remediation efforts were successful. Additional remediation is likely required at this site, and a Form 27-S work plan will be submitted prior to remediation implementation.

Soil Remediation Summary

☐ In Situ

☐ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____

_____ 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.

NA

REMEDATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

☒ Quarterly ☐ Semi-Annually ☐ Annually ☐ Other Pit Closure Reporting

☐ 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 Pit closure confirmation soil sampling

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Foundation carries both pollution liability insurance and an umbrella policy over that for a total of \$11,000,000. Cost provided below is an estimate and may be adjusted based on site observations.

Operator anticipates the remaining cost for this project to be: \$ 50000

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? No

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:

REMEDATION COMPLETION REPORT

REMEDATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

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?

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.

The final wellhead flowline feeding into the Showers tank battery from the south was plugged during 2021, and the tank battery area has already been approved for NFA closure with COGCC (#403032706). As such, the entire tank battery area has been recontoured and reclaimed. The pit area was reseeded subsequent to the initial pit closure work. If warranted, FEM proposes to complete additional soil removal and reclamation activities following site closure. These activities will include removal and replacement of the surficial soils to match the surrounding ground surface conditions and reseeding of the former pit area in accordance with COGCC Series 1000 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? Yes

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

Did the local soil conservation district provide the seed mix? _____

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 10/01/2018

Proposed date of completion of Reclamation. 12/31/2023

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). 04/09/2018

Proposed site investigation commencement. 04/09/2018

Proposed completion of site investigation. 07/01/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 06/04/2018

Proposed date of completion of Remediation. 12/31/2023

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:

Recalcitrant soil suitability concentrations after initial and secondary remediation efforts.

OPERATOR COMMENT

Based on the recent and historical investigative information and analytical results, the hydrocarbon impacts in the vicinity of the former pit and skim tank have been removed along with the above ground infrastructure. Remaining impacts for soil suitability standards remain onsite and will likely require additional remediation. A Form 27-S will be submitted for COGCC approval prior to any additional remediation activities. The investigation described herein was performed based on two COAs and three comments on a Form 27-S closure request for this site (#401828226), and FEM has satisfied the requirements of those COAs in this report. The responses to the COAs and comments are summarized below:

COAs:

1) Operator will perform an assessment at the former skim tank location. Operator will collect a soil sample from native soil from beneath the former skim tank and analyze the soil sample for Table 915-1 Soil TPH (C6-C36), Organics in soil, and soil suitability parameters.

Response: A sample was collected for Table 915-1 organics and soil suitability parameters from beneath the former skim tank on 5/12/2021 and reported in approved Form 27-S #402721018, and exceedances of Table 915-1 EC and SAR values were observed. A confirmation sample was collected in the same location for only those parameters on 5/17/2022, and impacts were not observed. With COGCC approval, further investigation or remediation in the skim tank area is not proposed at this time.

2) Operator will either confirm locations of soil samples SS07 - SS10 or perform an assessment of Table 915-1 soil suitability parameters in the reclaimed pit area.

Response: A soil suitability assessment was performed in this area, and the initial results were reported in approved Form 27-S #402721018. Additional confirmation samples were collected on 9/30/2021, 5/17/2022, and 12/5/2022 and results are included in Table 1 and Figure 3. Results of the soil suitability assessment indicated that pH, SAR, and boron concentrations exceeding Table 915-1 standards are present in the soil and additional remediation is required. Prior to additional remediation, a Form 27-S work plan will be submitted for COGCC approval.

General Comments:

1) Provide sample locations and depths for the samples SS-7 through SS-10 analyzed for pH, EC, and SAR. All four samples exceed the Table 910-1 level of 12 for SAR.

Response: Locations could not be confirmed. A soil suitability assessment was performed on 5/12/2021, and results were presented in Form 27-S #402721018. Additional confirmation results from follow up investigations are presented in this report.

2) Provide data for the assessment of the skim tank as directed in the approved Initial Form 27.

Response: Initial data for the skim tank assessment were provided in Form 27-S #402721018, and results from the 5/17/2022 confirmation sampling are provided in this report. Based on the results of the 5/12/2022 and 5/17/2022 soil investigations, impacts greater than Table 915-1 standards are not present at the skim tank and further investigation is not proposed.

3) Provide information for the assessment of inorganic parameters for the pit berms, or clarify that the berm material was removed for disposal.

Response: FEM has clarified in the source removal summary above that the pit berms were removed for disposal.

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

Signed: Afton Iiams

Title: HSE/Regulatory Technician

Submit Date: 03/08/2023

Email: regulatory@foundationenergy.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: Kyle Waggoner

Date: 05/16/2023

Remediation Project Number: 11274

COA Type

Description

	Operator will continue quarterly reporting until the site investigation is complete and the implementation schedule can be updated. COGCC selected Quarterly under Remediation Progress Update.
	Operator shall provide a comprehensive list of all potential receptors within ¼ mile on the subsequent Supplemental Form 27. Location lies within the following mapped High Priority Habitat(s): - Pronghorn Winter Concentration Please note that Approval of this Form 27 does not supersede any Federal, State or Local regulations. COGCC recommends consultation with Colorado Parks and Wildlife.
2 COAs	

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>
403120570	FORM 27-SUPPLEMENTAL-SUBMITTED
403304819	OTHER

Total Attach: 2 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Results of the soil suitability assessment indicated that pH, SAR, and boron concentrations exceeding Table 915-1 standards are present in the soil and additional remediation is required. Prior to additional remediation, a Form 27-S work plan will be submitted for COGCC approval.	05/09/2023

Total: 1 comment(s)