

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
Krystal Heibel

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>		
City: <u>ADDISON</u>	State: <u>TX</u>	Zip: <u>75001</u>
Contact Person: <u>Afton Iiams</u>	Email: <u>aiiams@foundationenergy.com</u>	
		Phone: <u>(972) 707-2523</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: _____

SITE INFORMATION

No Multiple Facilities

Facility Type: <u>PIT</u>	Facility ID: <u>274748</u>	API #: _____	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: _____	Longitude: _____
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:

- | | | |
|--|--|--|
| <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	SOILS	~3600 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 #403120570 (pending COGCC approval). 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 2021-2023 and the details of the March 2023 soil investigation 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 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. Based on observed exceedances of Table 915-1 soil suitability for reclamation parameters, a soil investigation was performed on 3/30/2023 at the locations presented on Figure 3 for Table 915-1 VOCs, TPH, PAHs, soil suitability for reclamation parameters. Laboratory results are presented in Tables 1-3.

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 23

Number of soil samples exceeding 915-1 20

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

Approximate areal extent (square feet) 3600

NA / ND

-- Highest concentration of TPH (mg/kg) 13500

-- Highest concentration of SAR 24.7

BTEX > 915-1 Yes

Vertical Extent > 915-1 (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)

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?

Two background samples were collected and analyzed for Table 915-1 soil suitability for reclamation parameters on 3/30/2023. The results of the background sample are presented on Table 3.

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?

Based on the results of Table 915-1 organic constituents at SS-02 and soil suitability for reclamation at the majority of sampled locations, additional investigation will likely be 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.

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 VOCs, TPH, PAHs, pH, EC, 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.

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.

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. A Form 27-S work plan will be submitted prior to additional remediation implementation.

Soil Remediation Summary

In Situ

Ex Situ

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

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

NA

REMEDIATION 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: _____

REMEDIATION COMPLETION REPORT

REMEDIATION 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? 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.

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. _____

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. 12/01/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/31/2023

Proposed date of completion of Remediation. 03/31/2024

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

Based on the recent and historical investigative information and analytical results, remaining impacts remain onsite and will likely require additional remediation. A Form 27-S will be submitted for COGCC approval prior to any additional remediation activities.

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: 05/11/2023

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: Krystal Heibel

Date: 06/20/2023

Remediation Project Number: 11274

COA Type**Description**

	If a spill/release of produced fluids or E&P waste causes an impact to soil, the operator should perform sampling and analysis to fully delineate the lateral and vertical extent of those impacts. The 5/12/2021 and 3/30/2023 sampling events shows soil suitability exceedances throughout the pit location.
	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.
	Operator shall fully populate the implementation schedule in accordance with Rule 913.d on the next Form 27.
	Operator will continue quarterly reporting until the site investigation is complete. COGCC selected Quarterly under Remediation Progress Update.
4 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.

Att Doc Num**Name**

403391849	FORM 27-SUPPLEMENTAL-SUBMITTED
403400146	OTHER

Total Attach: 2 Files

General Comments**User Group****Comment****Comment Date**

Environmental	"Based on VOCs, TPH, PAHs, pH, EC, SAR, and boron concentrations greater than Table 915-1 standards, additional remediation is likely required at this site."	06/16/2023
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Total: 1 comment(s)