

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:  
402565168  
Receive Date:  
01/14/2021  
Report taken by:  
KRIS NEIDEL

Site Investigation and Remediation Workplan (Initial 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 INFORMATION

Name of Operator: FOUNDATION ENERGY MANAGEMENT LLC	Operator No: 10112	Phone Numbers Phone: (303) 2448114 Mobile: (720) 2572302
Address: 5057 KELLER SPRINGS RD STE 650		
City: ADDISON	State: TX	Zip: 75001
Contact Person: Alyssa Beard	Email: abeard@foundationenergy.com	

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 17342 Initial Form 27 Document #: 402565168

**PURPOSE INFORMATION**

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
<input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure	<input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
<input checked="" type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation	<input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project
<input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste	<input type="checkbox"/> Rule 906.c.: Director request
<input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure	<input checked="" type="checkbox"/> Other December 2020 Soil and Groundwater investigation summary update

**SITE INFORMATION** N Multiple Facilities ( in accordance with Rule 909.c. )

Facility Type: LOCATION	Facility ID: 324639	API #: _____	County Name: JACKSON
Facility Name: ALLARD-610N79W 30SENE	Latitude: 40.812241	Longitude: -106.301789	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SENE	Sec: 30	Twp: 10N	Range: 79W Meridian: 6 Sensitive Area? Yes

**SITE CONDITIONS**

General soil type - USCS Classifications GW Most Sensitive Adjacent Land Use Non-Crop Land - Silver Spur Land and Cattle

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**

The Allard location was constructed in alluvial material associated with the Michigan River.

# 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 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	GROUNDWATER	unknown	Laboratory analysis
Yes	SOILS	150 square feet	laboratory analysis

## INITIAL ACTION SUMMARY

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

Initial actions and completed remedial measures have previously been submitted to the COGCC in the Form 19 Initial (Document# 402528181), and in the Form 19 Supplemental (Document #402545454). The impacts were initially discovered in late September 2020 and believed from a historical spill of unknown origins. The Allard well was plugged and decommissioned in November 2020 and impacted material was discovered in two separate areas of the Site at the former wellhead and near the treater during the flowline abandonment activities. Following the well plugging activities, initial delineation activities were completed on December 1, 2020 and included test pitting and sampling activities. Lab results confirmed groundwater was above COGCC standards for benzene, and that further groundwater investigation was required. Following delineation of the soils, the excavation was backfilled to existing grade and further remedial activities are being coordinated. Further details of the December 2020 delineation activities and proposed workplan are provided within this Form 27 Initial workplan.

## 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 ):

Once the well had been plugged and excavation in the vicinity was possible, delineation activities were performed on 12/1/20. Four soil samples were collected from the former wellhead area on the north side of the Site and 7 soils samples were collected from the former battery and treater area located on the south side of the Site. Soil samples were analyzed for BTEX and TPH (GRO & DRO) by Summit Scientific, and the results are presented on Tables 1 and 3 and illustrated on Figures 2 and 4. Future excavation and source removal activities may be necessary at the Site to address additional impacted material and a work plan will be presented to the COGCC in subsequent Form 27 progress reports. During these activities, soils will be evaluated for geological conditions and identify potential impacts on Site. Soil samples will be collected from zones representative of the highest PID detections including the base of the excavation and submitted for laboratory analysis.

### Proposed Groundwater Sampling

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

Once the well was plugged, delineation activities were performed on 12/1/20. Groundwater was observed to be impacted at the groundwater interface at the wellhead. Six groundwater samples from the former battery area, and five groundwater samples from the former wellhead area, were collected and analyzed for BTEX. The soil-groundwater interface ranged from about 5 to 7 feet below ground surface across the Site from north to south. Two samples reported were above the Table 910 standards during these activities. One was located at the former wellhead (north side) and one at the southern test pit location on the south side of the Site. The groundwater results are presented in Tables 2 and 4 and illustrated on Figures 3 and 5. Laboratory reports are included as attachments. Further delineation and remedial activities may be needed to delineate the extent of groundwater impacts at the Site and a workplan will be presented to the COGCC for approval once activities are coordinated..

### Proposed Surface Water Sampling

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

If site conditions warrant, the need for future monitoring at surface water locations will be evaluated.

## Additional Investigative Actions

Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

Based on field observations and the recent results at the wellhead and treater areas, FEM would consider evaluating further investigation and alternative remediation approach applicable to the Site with landowner and COGCC approval, which may include, but not limited to the potential use of additional chemox or other treatment methods to mitigate the impacted area beneath the surface. Updates and a workplan will be discussed and provided to COGCC in a subsequent Form 27S progress report.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 11  
Number of soil samples exceeding 910-1 3  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 250

### NA / ND

-- Highest concentration of TPH (mg/kg) 3900  
NA Highest concentration of SAR           
BTEX > 910-1 Yes  
Vertical Extent > 910-1 (in feet) 6

### Groundwater

Number of groundwater samples collected 11  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 6'  
Number of groundwater monitoring wells installed 0  
Number of groundwater samples exceeding 910-1 2

-- Highest concentration of Benzene (µg/l) 13000  
-- Highest concentration of Toluene (µg/l) 9500  
-- Highest concentration of Ethylbenzene (µg/l) 17  
-- Highest concentration of Xylene (µg/l) 12000  
NA Highest concentration of Methane (mg/l) 0

### Surface Water

0 Number of surface water samples collected  
         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)          Volume of liquid waste (barrels)         

Is further site investigation required?

Based on field observations and the recent results at the wellhead and treater areas, FEM would consider evaluating further investigation and alternative remediation approach applicable to the Site with landowner and COGCC approval, which may include, but not limited to the potential use of additional chemox or other treatment methods to mitigate the impacted area beneath the surface. Updates and a workplan will be discussed and provided to COGCC in a subsequent Form 27S progress report.

# REMEDIAL ACTION PLAN

## SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

As previously reported in the Form 19 Supplemental (Document #402545454) initial source remediation efforts were performed in November and December 2020, which included the plugging and decommissioning of Allard Well and flowline and removed impacted material from both investigative areas at the Site. During excavation activities, groundwater was observed to infiltrate the test pits at 5-7 feet below ground surface and sampled for BTEX. Once a remediation workplan and coordinated, as much remaining source material will be removed from the Site once conditions allow for access following the winter season and transported to an off-site disposal facility and backfilled to match pre-existing conditions. If warranted, FEM would consider evaluating further investigation and alternative remediation approach applicable to the Site with landowner and COGCC approval, which may include, but not limited to the potential use of additional chemox or other treatment methods to mitigate the impacted area beneath the surface.

## 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.

Following the completion of the approved remediation efforts and/or treatment of impacted soils and groundwater associated with the Site and to investigate potential residual impacts and the horizontal extent of groundwater, monitoring wells may be installed at the Site. A remedial and groundwater monitoring program will be presented to COGCC for approval in a subsequent form 27 progress report. Groundwater monitoring will be performed at the Site until a period of four consecutive monitoring events have demonstrated that groundwater impacts are below COGCC Table 910-1 standards. At that time, a no further action (NFA) determination for the Site will be requested from the COGCC.

## Soil Remediation Summary

### In Situ

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

### Ex Situ

- 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.

Groundwater samples were collected on December 1, 2020 from eleven open test pit locations via a grab sample using a bailer from the open excavation and were submitted to Summit Scientific (Summit) for BTEX analysis using USEPA method 8260B. Groundwater was observed to be at the bottom of each test pit around 5-7 feet below ground surface. Based on the results during the initial delineation activities, two samples were above the Table 910 standards and located at the former wellhead (WJPIT-01) on the northern side and at the test pit location (TP-08) located near the treater area on the south side of the Site. The December 2020 laboratory analytical data collected from the Allard (North) and Allard (South) areas is summarized in Table 2 and 4 and illustrated on Figures 3 and 5, respectively. The laboratory analytical reports are included as attachments. Based on the review of analytical results, additional remedial investigation and monitoring will likely be necessary at the Site and a workplan will be presented to the COGCC for approval. Future Site-wide groundwater gauging and sampling data will be used to evaluate hydraulic characteristics and provide information regarding seasonal fluctuations at the Site.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

Frequency:  Quarterly  Semi-Annually  Annually  Other Not Applicable at this time.

Report Type:  Groundwater Monitoring  Land Treatment Progress Report  O&M Report

Other Field Activities and delineation summary update report.

## 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: \_\_\_\_\_

## 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 location will be reclaimed as much as possible once initial remediation efforts have been completed, and will be completed in full based on COGCC's 1000 series rules once remediation of impacts on site are completed.

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. \_\_\_\_\_

Actual Spill or Release date, if known. \_\_\_\_\_

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/01/2020

Date of commencement of Site Investigation. \_\_\_\_\_

Date of completion of Site Investigation. \_\_\_\_\_

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 04/19/2021

Date of completion of Remediation. 05/28/2021

### SITE RECLAMATION DATES

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

**OPERATOR COMMENT**

Foundation will submit a proposed remediation plan based on the December 2020 findings on a subsequent Form 27. This will be submitted in the first quarter 2021.  
Thanks

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

Signed: Alyssa Beard \_\_\_\_\_

Title: EHSR Manager \_\_\_\_\_

Submit Date: 01/14/2021 \_\_\_\_\_

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: KRIS NEIDEL \_\_\_\_\_

Date: 03/23/2021 \_\_\_\_\_

Remediation Project Number: 17342 \_\_\_\_\_

**COA Type****Description**

	Sample area TP-01 @5.0' showed 0.025mg/kg Benzene. This is an exceedance to Table 915-1. Further delineation (and Remediation) is required in this area.
	By April 30 a plan to delineate Groundwater impacts shall be provided on a Supplemental Form 27. Start date of work shall be spring 2021.
	Due to shallow groundwater at the impacted area, Soil must comply with COGCC Table 915-1, Protection of Groundwater Soil Screening Level Concentrations.
	Total Petroleum Hydrocarbon (TPH) is defined in COGCC Table 915-1 as C6-C36. Lab samples shall be for appropriate carbon range.
	Analytical data in next quarters report should be updated for comparison to COGCC table 915-1.

**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**

402565168	FORM 27-INITIAL-SUBMITTED
402574830	ANALYTICAL RESULTS

Total Attach: 2 Files

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

Environmental	It is stated that "laboratory analytical reports are included as attachments" they were NOT included as attachments.	03/23/2021
Environmental	The "observed soil Pile" mentioned in inspection 694500243 was sampled in this report, represented as sample id BDPIT @ 5.0'	03/23/2021

Total: 2 comment(s)