

# State of Colorado Oil and Gas Conservation 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: FOUNDATION ENERGY MANAGEMENT LLC	Operator No: 10112	Phone Numbers Phone: (303) 244-8114 Mobile: (720) 257-2302
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

- ☐ 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: 1Q22 Groundwater Summary and Remediation Workplan

#### SITE INFORMATION

No Multiple Facilities

Facility Type: WELL	Facility ID:	API #: 057-06124	County Name: JACKSON
Facility Name: ALLARD 30-8-5		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:

☒ 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
Yes	GROUNDWATER	Unknown	Laboratory analysis
Yes	SOILS	150 square feet	Laboratory analysis

### INITIAL ACTION SUMMARY

Description of initial action or emergency response measures taken 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 19I (Document #402528181), in the Form 19S (Doc #402545454), and in the Form 27I (Doc #402565168). A remediation work plan was submitted in a Form 27S (Doc #402669575). The COGCC assigned spill tracking facility ID #324639 and remediation number #17342 for the Site. The impacts were initially discovered in late September 2020 and believed to be 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 well jack area (WJA) on the northern portion of the site and near the former battery and treater area (FBTA) on the southern portion of the site. Following the well plugging activities, initial delineation activities were completed on December 1, 2020, and included test pitting and sampling activities. Impacted material was hauled offsite, and clean backfill material was used to fill the test pits until further delineation and a remediation workplan could be prepared. Lab results confirmed groundwater was above COGCC standards for benzene, and that further investigation was required. During May 2021, additional soil impacts were removed by excavation and nine groundwater monitoring wells were installed. Results of that remediation and investigation were presented in a Form 27S (Document #402726781). Details of the first quarter 2022 (1Q22) groundwater monitoring event, as well as monthly water level gauging, are provided herein.

### 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 ):

Previous soil results were presented in the F27I (#402565168) and F27S (Document #402726781). However, based on conversations with COGCC, a summary of previous soil results is included in Attachment B of this report. During the initial investigation in December 2020, TPH was observed in soil at concentrations greater than the Table 910 and new Table 915 standard of 500 mg/kg at TP-05 and TP-08. However, soil confirmation samples collected during subsequent test pitting and monitoring well installation (MW03 and MW05) during 2Q21 showed that TPH concentrations were below Table 915 standards at these locations. Benzene was observed above the Table 915-1 standard during previous investigations at MW03, TP-01, and WJPIT-01, which will require additional confirmation samples. Further discussion is included in the Further Site Investigation section below.

#### Proposed Groundwater Sampling

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

Nine monitoring wells were installed in 2Q21, and 7 monitoring wells were sampled during the 1Q22 monitoring event. Groundwater samples were submitted to Summit Scientific laboratory for Table 915 organic analysis. Monitoring wells MW04 (dry) and MW09 (damaged by livestock) were unable to be sampled during the 1Q22 event. Impacts have not been observed at either well during past events, but attempts to sample with alternative methods will be made during the 2Q22. Additionally, 8 monitoring wells are gauged monthly to evaluate groundwater conditions and the effect that the nearby surface water has on the groundwater table (Table 1). Analytical data from the 1Q22 monitoring event are presented on Table 2 and illustrated on Figures 5 & 6. Laboratory reports are provided as Attachment A. The 1Q22 was the fourth consecutive quarter of groundwater results below Table 915 but quarterly monitoring, with the addition of Table 915 inorganics, will continue in 2Q22.

#### Proposed Surface Water Sampling

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

During the May 2021 investigation, one surface water sample was collected for Table 915 groundwater parameters from the drainage on the west side of the FBTA at SW01 (see Figure 7) and presented in F27S (Document #402726781). At the request of COGCC, additional surface water samples at the WJA and FBTA will be sampled and analyzed for Table 915-1 organics and inorganics during the 2Q22 monitoring event. Proposed surface sample locations are presented on Figures 7 and 8.

## **Additional Investigative**

### **Actions**

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

Based on COAs to previous reports and conversations with COGCC, additional surface water sampling, soil delineation, and soil confirmation sampling will take place during the second and third quarters of 2022.

## **SITE INVESTIGATION REPORT**

### **SAMPLE SUMMARY**

#### **Soil**

Number of soil samples collected 0

Number of soil samples exceeding 915-1 0

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

Approximate areal extent (square feet) 250

#### **NA / ND**

NA Highest concentration of TPH (mg/kg)

NA Highest concentration of SAR

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 8

#### **Groundwater**

Number of groundwater samples collected 7

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 4'

Number of groundwater monitoring wells installed 9

Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l)

ND Highest concentration of Toluene (µg/l)

ND Highest concentration of Ethylbenzene (µg/l)

ND 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 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?

Background soil and groundwater samples upgradient of the source areas have been identified in Appendix B as MW02 in the FBTA and MW09 in the WJA. Additional test pit presented in Figures 7 and 8 will be advanced to further define soil and groundwater delineation and establish background concentrations.

☒ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) 492

Volume of liquid waste (barrels) 80

☒ Is further site investigation required?

Results of the initial investigation were provided in the approved Form 27 Initial (#402565168) and the approved remediation summary was provided in a Form 27-S (#402726781). Results of previous investigations are also included in Appendix B of this report. Based on COAs to the remediation summary and a meeting with COGCC, further investigation at both the FBTA (Allard South) and WJA (Allard North) areas is planned to be completed during the second and third quarters 2022. Soil samples from the base of the excavation at the WJA near the previous sample location WJA-B@5' will be collected and analyzed for Table 915-1 VOCs, PAHs, pH, EC, SAR, and arsenic. Additionally, the south side of the excavation where 1-methylnaphthalene at WJA-S@4.5' was observed above the 915 standards will be further delineated and sampled for the same list of analytes, and a test pit to the northeast of the excavation will be sampled for soil and groundwater as an additional background sample.

At Allard South, additional delineation in the areas shown on Figure 7 will be conducted, and soil samples will be analyzed for the site-specific analytes listed above.

The 1Q22 groundwater monitoring event marked the fourth consecutive quarter of groundwater results below the Table 915-1 organic standards. However, at COGCC request, an additional quarterly surface and groundwater monitoring event will take place during the 2Q22 for Table 915-1 organics and inorganics. Monthly groundwater gauging will continue through April 2022, at which time data for 12 consecutive months will be available and monthly gauging will be suspended.

## 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.

Source removal activities were conducted in May 2021, and the details are presented in a previous F27S (Document #402726781). Soil confirmation results from that event are also presented in this report in Appendix B. During the proposed investigation activities planned for the spring / summer of 2022, any additional impacted material encountered will be removed from the Site.

### 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.

Following the excavation of impacted soil at the WJA, monitoring wells were installed to delineate the extent of groundwater contamination. Monitoring wells were also installed at the FBTA, even though full-scale excavation did not take place, and groundwater impacts were not observed at either of the two investigative areas. In response to a COGCC COA on the remediation work plan (Document #40266975), monthly gauging of the monitoring wells is being completed and will continue through April 2022. Quarterly groundwater monitoring is being performed at the site, and the 1Q22 event marks the fourth consecutive quarter with no observed impacts. The COGCC also requested one additional quarterly event that includes Table 915 inorganics and surface water sampling and FEM plans to complete these in the 2Q22 event. Soil confirmation sampling will take place during the additional remediation and investigation activities. With COGCC approval and based on the soil data collected compared to the Table 915-1 standards, a no further action (NFA) determination for the Site will be requested from the COGCC.

### Soil Remediation Summary

☐ In Situ

☒ Ex Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

Yes \_\_\_\_\_ Excavate and offsite disposal

\_\_\_\_\_ Chemical oxidation

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) 492

\_\_\_\_\_ 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

Yes \_\_\_\_\_ 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.

A total of 9 monitoring wells were installed at the Site in May 2021, five in the FBTA (MW01-MW05) and four in the WJA (MW06-MW09), and groundwater samples were collected from seven of the well locations during the 1Q22 monitoring event. Monitoring wells MW04 (dry) and MW09 (damaged by livestock) were unable to be sampled during the 1Q22 event. Impacts have not been observed at either well during past events, but attempts to sample MW09 via alternate sampling methods will take place during 2Q22. Based on historical groundwater elevation data, seasonal fluctuations in the groundwater table will allow MW04 to be sampled during certain times of the year when the groundwater table is elevated. The monthly and 1Q22 water level and calculated groundwater elevations are presented in Table 1 and illustrated on Figures 3 and 4. Laboratory analysis was conducted by Summit Scientific for Table 915-1 organic constituents, and all seven samples were below the laboratory detection limits and COGCC standards. The laboratory results are presented on Table 2 and illustrated on Figures 5 and 6.

## REMEDIATION PROGRESS UPDATE

### PERIODIC REPORTING

#### Approved Reporting Schedule:

☒ Quarterly

☐ Semi-Annually

☐ Annually

☐ Other

#### ☐ 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 1Q22 Groundwater Summary and Remediation Work Plan

### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? Yes

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

None

Volume of E&P Waste (solid) in cubic yards 492

E&P waste (solid) description petroleum impacted soils

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Pawnee Waste, Grover CO

Volume of E&P Waste (liquid) in barrels 80

E&P waste (liquid) description groundwater

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Pawnee Waste

## 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? \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? \_\_\_\_\_

Does Groundwater meet Table 915-1 standards? \_\_\_\_\_

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

## 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.

Both sites have been backfilled and will be reclaimed upon final remediation approval. Foundation proposes to reseed the locations with a seed mix approved by the landowner during the next favorable season after approval and weed spraying will be utilized for weed prevention until final reclamation has been achieved. Final reclamation will be performed in accordance with 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? \_\_\_\_\_

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

Did the local soil conservation district provide the seed mix? \_\_\_\_\_

### SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. \_\_\_\_\_

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). 12/01/2020 \_\_\_\_\_

Proposed site investigation commencement. 05/11/2021 \_\_\_\_\_

Proposed completion of site investigation. \_\_\_\_\_

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/11/2021 \_\_\_\_\_

Proposed date of completion of Remediation. \_\_\_\_\_

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 supplemental Form 27 has been provided as a first quarter 2022 groundwater monitoring summary, status update report, and remediation work plan for the Allard North (WJA) and Allard South (FBTA) sites in Jackson County, Colorado. Per COGCC request during a February 24, 2022 meeting, the historical groundwater, surface water, and soil results have been included in this report as an Appendix B. During the first quarter, seven of the nine monitoring wells at the site were sampled and table 915-1 organic contaminant concentrations were not detected above the laboratory detection limits for the fourth consecutive quarter. Quarterly groundwater monitoring will continue per COGCC request until remedial activities show that soil impacts are in compliance with COGCC and Table 915-1 standards. FEM plans to complete additional soil and groundwater investigations during 2022 to further demonstrate that the Site does not pose an ongoing risk to groundwater, human health, or the environment, and the data will be presented to the COGCC. At that time, a no further action (NFA) determination for the Site will be requested from the COGCC. Based on COAs to previous reports and a meeting with COGCC, in addition to a first quarter 2022 groundwater summary, this report specifically addresses: 1) additional excavation and confirmation sampling locations; 2) historical groundwater and soil data with upgradient background locations identified; and 3) proposed surface water sampling locations. Information within this Supplemental Form 27 is associated with REM# 17342 in conjunction with the Allard 30-8-5 wellhead (Facility ID 324639) historical release that was discovered during the initial well decommissioning activities.

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

Signed: Alyssa Beard

Title: EHS Manager

Submit Date:

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:

Date:

Remediation Project Number: 17342

**COA Type****Description**

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**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**

402998667	ANALYTICAL RESULTS
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Total Attach: 1 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)