

State of Colorado Oil and Gas Conservation Commission

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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: 2Q22 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 second quarter 2022 (2Q22) 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). 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. However, groundwater impacts have not been observed downgradient of these locations, and additional remediation or confirmation sampling will be proposed in a subsequent Form 27 work plan, if necessary.

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 8 monitoring wells were sampled for 915-1 constituents during the 2Q22. Monitoring well MW09 (damaged by livestock) was unable to be sampled with a bailer during the 2Q22 event. Impacts have not been observed at monitoring well MW09 during past events, but attempts to sample with alternative methods will be made during the 3Q22. Additionally, site monitoring wells were gauged monthly from May 2021 to May 2022 to evaluate groundwater conditions and the effect that the nearby surface water has on the groundwater table (Table 1). Based on verbal approval from COGCC, monthly groundwater gauging will not continue after May 2022. The 2Q22 was the fifth consecutive quarter of groundwater results below Table 915, and FEM proposes, as verbally approved during a 7/6/22 meeting with COGCC, a semi-annual 915-1 organics groundwater sampling schedule to continue in 4Q22 with Table 915 inorganics sampled on an annual basis beginning with the 2Q23.

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, two additional surface water samples were collected at the WJA and FBTA and analyzed for Table 915-1 organics and inorganics during the 2Q22 monitoring event. Surface water sample results are presented in Table 2 and illustrated on Figures 5 and 6. Based on verbal approval during the 7/6/22 meeting with COGCC and historical results, FEM proposes removal of surface water sampling from the sampling plan for future sampling events.

Additional Investigative Actions

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

Based on verbal approval during the 7/6/22 meeting with COGCC, FEM proposes additional confirmation sampling and remediation, if necessary, of historical soil contamination in the Allard North and South areas to occur during the second half of 2022. Additionally, COGCC gave verbal approval for removal of Table 915-1 metals from the site-specific sampling and analysis plan (SAP), and FEM proposes to use that updated SAP during future investigation and remediation sampling.

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 8

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

2 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 as MW02 in the FBTA and MW09 in the WJA. Additional background soil samples will be collected during future investigation and remediation efforts.

☒ 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). 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 half 2022 and were presented in the 1Q22 Form 27-S remediation work plan (#402969458). 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 organics and soil suitability parameters. 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 in accordance with the updated SAP. At the FBTA, additional investigation will take place at MW03, TP-01, and TP-05 where previous impacts were observed.

The 2Q22 groundwater monitoring event marked the fifth consecutive quarter of groundwater results below the Table 915-1 organic standards. Monthly groundwater gauging continued through May 2022, at which time data for 12 consecutive months was made available and monthly gauging was suspended based on verbal approval from COGCC. Based on the last five quarters of groundwater data below Table 915-1 standards, further site investigation will focus on continued soil delineation with semi-annual groundwater monitoring.

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). During the proposed investigation activities planned for the summer of 2022, any additional impacted material encountered will be removed from the Site.

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 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 has been completed through April 2022. Quarterly groundwater monitoring is being performed at the site, and the 2Q22 event marks the fifth consecutive quarter with no observed impacts. 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

Bioremediation (or enhanced bioremediation)

Chemical oxidation

Air sparge / Soil vapor extraction

Natural Attenuation

Other

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 492

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

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 nine 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 eight of the well locations during the 2Q22 monitoring event. Monitoring well MW09 (damaged by livestock) was unable to be sampled during the 2Q22 event. Impacts have not been observed at monitoring well MW09 during past events, but attempts to sample MW09 via alternate sampling methods will take place during the next sampling event. The monthly and 2Q22 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 and inorganic constituents, and all eight organic samples were below the laboratory detection limits and COGCC standards. Sufficient volume was not present for inorganic groundwater analysis at MW04, but the other seven locations exhibited inorganic concentrations below 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 2Q22 Groundwater Summary and Remediation Work Plan

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? 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? _____

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.

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. 12/31/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/11/2021

Proposed date of completion of Remediation. 12/31/2022

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 second 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. During the 2Q22, eight 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 fifth consecutive quarter. Based on verbal approval from COGCC, FEM proposes a semi-annual Table 915-1 organics groundwater sampling schedule with Table 915 inorganics sampled annually until remedial activities show that soil impacts are in compliance with COGCC and Table 915-1 standards. FEM plans to complete additional soil 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.

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: EHSR 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

0 COA	

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

403269955	OTHER
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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)