

State of Colorado  
Energy & Carbon Management Commission

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Report taken by:  
Candice (Nikki) Graber

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 ECMC 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: NOBLE ENERGY INC	Operator No: 100322	Phone Numbers Phone: (970) 730-7281 Mobile: ( )
Address: 1099 18TH STREET SUITE 1500		
City: DENVER	State: CO	Zip: 80202
Contact Person: Dan Peterson	Email: rbueuf27@chevron.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 26337 Initial Form 27 Document #: 403258228

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

Yes Multiple Facilities

Facility Type: LOCATION	Facility ID: 416318	API #: _____	County Name: WELD
Facility Name: BUTTERBALL D 19-27D	Latitude: 40.218850	Longitude: -104.583600	
** correct Lat/Long if needed: Latitude: 40.218390		Longitude: -104.583624	
QtrQtr: SWSW	Sec: 17	Twp: 3N	Range: 64W Meridian: 6 Sensitive Area? Yes
Facility Type: SPILL OR RELEASE	Facility ID: 483566	API #: _____	County Name: WELD
Facility Name: LDS D20-30D	Latitude: 40.218411	Longitude: -104.583671	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWSW	Sec: 17	Twp: 3N	Range: 64W Meridian: 6 Sensitive Area? Yes



# 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 checked="" 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
UNDETERMINED	GROUNDWATER	NA	Lab analysis if encountered
UNDETERMINED	SOILS	10'x10'x6' BGS	Lab 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.

A site investigation was conducted pursuant to ECMC Rule 911 at the BUTTERBALL THOMPSON LDS T3N-R64W-S1 L01 Tank Battery location. The remediation associated with spill number 483566 (LDS D20-30D) was consolidated onto remediation number 26337, and quarterly reporting will continue under remediation number 26337. This request was approved on ECMC document number 403535521.

## 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 ):

Grab confirmation soil samples were collected from the produced water vessel(s) excavation, beneath the ground oil tank(s), and at the risers for the flowline(s) and dumpline(s) of any separator(s). Soil samples were analyzed by a certified laboratory for TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil per ECMC Table 915-1, and EC, SAR, pH, and boron. Additionally, one (1) soil sample was analyzed by a certified laboratory for metals in soil per ECMC Table 915-1. All samples collected were analyzed by a certified laboratory using approved ECMC laboratory analysis methods.

### Proposed Groundwater Sampling

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

If groundwater is encountered during the site investigation a grab groundwater will be collected and analyzed for all organic compounds per ECMC Table 915-1.

### 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 ):

Visual inspection at the tank battery area occurred during abandonment activities. Field personnel field screened all disturbed areas using visual and olfactory senses to determine if laboratory confirmation sampling is required. The ECMC Tank Battery and Produced Water Vessel Closure Checklists was utilized and filled out during the abandonment process. A photolog was submitted on the Subsequent Form 27.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

Soil

NA / ND

Number of soil samples collected 53

-- Highest concentration of TPH (mg/kg) 2008

Number of soil samples exceeding 915-1 33 -- Highest concentration of SAR 5.04  
 Was the areal and vertical extent of soil contamination delineated? Yes            BTEX > 915-1 No  
 Approximate areal extent (square feet) 400 Vertical Extent > 915-1 (in feet) 15

**Groundwater**

Number of groundwater samples collected 13 ND Highest concentration of Benzene (µg/l)             
 Was extent of groundwater contaminated delineated? Yes            ND Highest concentration of Toluene (µg/l)             
 Depth to groundwater (below ground surface, in feet) 7 ND Highest concentration of Ethylbenzene (µg/l)             
 Number of groundwater monitoring wells installed 13 ND Highest concentration of Xylene (µg/l)             
 Number of groundwater samples exceeding 915-1 0 NA Highest concentration of Methane (mg/l)           

**Surface Water**

0 Number of surface water samples collected  
           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?

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

Volume of solid waste (cubic yards) 180 Volume of liquid waste (barrels) 0

Is further site investigation required?

Following the results of the February 2023 site investigation activities and subsequent site assessment on 05/31/2023, a remedial excavation was conducted at the separator on 2/15/2024-2/16/2024 to remove the hydrocarbon impacted soil. Samples were collected from all four (4) sidewalls and base of excavation (SS01-08@7', FS01@8', FS02@8'). A total of 10 soil samples were collected and analyzed for TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil, metals in soil per ECMC Table 915-1.

Soil analytical results indicated that organic compound concentrations were in compliance with the applicable ECMC regulatory standards in all soil sample locations. Arsenic concentrations were in exceedance of the applicable regulatory standard in all 10 soil samples and greater than 1.25x the mean arsenic concentration (2.4 mg/kg) in two (2) soil sample locations (FS02@8' and SS07@7'). Concentrations of barium were in exceedance of the applicable regulatory standard in three (3) soil samples (SS03@7', SS04@7' and SS07@7'). All other metals concentrations were in compliance with the applicable regulatory standard in all sampled locations. Finally, concentrations of pH were below the applicable regulatory standard (8.3) in all sampled locations except for SS04@7', with a detection of 8.36.

Based on soil analytical results, further site investigation activities are required to assess background concentrations of pH, arsenic, and barium on location. The proposed soil boring locations are illustrated on Figure 3 of the attached Remedial Excavation Report.

**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.

A Site Assessment was conducted on 5/31/2023 to delineate impacted media associated with spill number 483919. Thirteen soil borings will be advanced surrounding FS01@5.5', FS02@6', and SEP01-FL@4' to delineate impacts vertically and laterally. Soil samples were collected and analyzed for TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil, metals in soil per ECMC Table 915-1, and EC, SAR, pH, and boron. Each of the 13 soil borings were converted to temporary groundwater monitoring wells. Thirteen groundwater samples were collected and analyzed for BTEX, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene and inorganic parameters.

During the first quarter 2024, four consecutive quarters of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, 1-M, and 2-M concentrations in compliance with the regulatory standards were achieved. Consequently, Noble is requesting to compare the remaining organic exceedances on site to ECMC Residential Soil Screening Levels (RSSLs). Based on the results, all soil on site has been removed or is in compliance with the ECMC RSSLs.

**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.

The source identified in association with spill number 483566 was removed through a remedial excavation conducted on 2/15/2024-2/16/2024. Approximately 180 cubic yards of soil were removed from the Site. A total of 10 soil samples were collected from the extent and base of excavation (SS01-08@7', FS01@8', and analyzed for TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil, metals in soil per ECMC Table 915-1.

Soil analytical results indicated that arsenic concentrations were in exceedance of the applicable regulatory standard in all 10 soil samples and greater than 1.25x the mean arsenic concentration (2.4 mg/kg) in two (2) soil sample locations (FS02@8' and SS07@7'). Concentrations of Barium were in exceedance of the applicable regulatory standard in three (3) soil samples (SS03@7', SS04@7' and SS07@7') and greater than 1.25x the mean Barium concentration (105 mg/kg) in two (2) soil sample locations (SS04@7' and SS07@7'). All other metals concentrations were in compliance with the applicable regulatory standard in all sampled locations. Finally, concentrations of pH were below the applicable regulatory standard (8.3) in all sampled locations except for SS04@7', with a detection of 8.36.

Following The completion of background soil sampling to eliminate arsenic, barium and pH as contaminants of concern, Noble will request a No Further Action (NFA) designation for the site.

**Soil Remediation Summary**

In Situ

Ex Situ

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

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

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

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 180

\_\_\_\_\_ Air sparge / Soil vapor extraction

\_\_\_\_\_ Name of Licensed Disposal Facility or ECMC 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.

Thirteen groundwater monitoring wells were installed (BH01-BH13) and will be sampled on a quarterly basis for analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene and inorganic parameters. Monitoring well BH13 was abandoned prior to February 2024 supplemental source mass removal activities.

During the first quarter 2024, four consecutive quarters of organic compound concentrations and inorganic parameters in compliance with the applicable regulatory standards were achieved. Consequently, Noble is requesting to discontinue groundwater monitoring at this location.

# 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 \_\_\_\_\_

## 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.

Noble intends to directly address the costs of remediation at the locations as part of our asset retirement obligation process and operations. Noble has general liability insurance (policy MWZZ 316714) and financial assurance in compliance with ECMC rules. Records are available on the ECMC's website. The cost for remediation is an estimate only, costs may change upwards or downward based on site-specific information. Noble makes no representation or guarantees as to the accuracy of the estimate.

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:

The source identified in association with spill number 483566 was removed through a remedial excavation conducted on 2/15/2024-2/16/2024. Approximately 180 cubic yards of soil were removed from the Site.

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_ 180

E&P waste (solid) description Soil \_\_\_\_\_

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

Non-ECMC Disposal Facility: \_\_\_\_\_

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_

E&P waste (liquid) description \_\_\_\_\_

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

Non-ECMC 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? \_\_\_\_\_

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 ECMC 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.

Reclamation will be in accordance with ECMC 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. 02/16/2024

Proposed date of completion of Reclamation. 06/30/2024

## 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. 07/20/2022

Actual Spill or Release date, or date of discovery. 02/22/2023

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/16/2022

Proposed site investigation commencement. 11/02/2024

Proposed completion of site investigation. 11/02/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/02/2024

Proposed date of completion of Remediation. 12/31/2024

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:

Based on soil analytical results, further site investigation activities are required to assess background concentrations of pH, arsenic, and barium on location. The proposed soil boring locations are illustrated on Figure 3.

**OPERATOR COMMENT**

This Supplemental Form 27 was submitted to summarize quarterly groundwater monitoring activities and analytical results collected during the the fourth quarter 2023 and the first quarter 2024 at the former Thompson D20-31D tank battery location.

Soil analytical results received for samples collected during February 2024 supplemental source mass removal activities indicated that organic compound concentrations were in compliance with the applicable ECMC regulatory standards in all soil sample locations. Arsenic concentrations were in exceedance of the applicable regulatory standard in all 10 soil samples. Concentrations of barium were in exceedance of the applicable regulatory standard in three (3) soil samples (SS03@7', SS04@7' and SS07@7'). All other metals concentrations were in compliance with the applicable regulatory standard in all sampled locations. Finally, concentrations of pH were below the applicable regulatory standard (8.3) in all sampled locations except for SS04@7', with a detection of 8.36.

Based on soil analytical results, further site investigation activities are required to assess background concentrations of pH, arsenic, and barium on location. The proposed soil boring locations are illustrated on Figure 3 of the attached Remedial Excavation Report.

During the first quarter 2024, four consecutive quarters of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, 1-M, and 2-M concentrations in compliance with the regulatory standards were achieved. Consequently, Noble is requesting to compare the remaining organic exceedances on site to ECMC Residential Soil Screening Levels (RSSLs). Based on the results, all soil on site has been removed or is in compliance with the ECMC RSSLs.

In addition, during the first quarter 2024, four consecutive quarters of inorganic parameters in compliance with the applicable regulatory standards were achieved. Consequently, Noble is requesting to discontinue groundwater monitoring at this location.

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

Signed: Jake Whritenour

Title: Environmental Consultant

Submit Date: 02/14/2024

Email: chevroneform@tasman-geo.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Candice (Nikki) Graber

Date: 10/23/2024

Remediation Project Number: 26337

**COA Type**

**Description**

	Operator may discontinue groundwater monitoring at this time. However, as additional investigation is ongoing, monitoring wells should not be abandoned until NFA is granted.
1 COA	

**ATTACHMENT 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**

403687575	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403883348	MONITORING REPORT
403883350	MONITORING REPORT
403883351	REMEDATION PROGRESS REPORT
403968360	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 5 Files

**General Comments**

**User Group**

**Comment**

**Comment Date**

		Stamp Upon Approval
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Total: 0 comment(s)