

State of Colorado  
Energy & Carbon Management Commission

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Document Number:  
403939375  
Receive Date:  
10/02/2024  
Report taken by:  
Nick Cholas

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	<b>Phone Numbers</b>
Address: 1099 18TH STREET SUITE 1500		Phone: (970) 730-7281
City: DENVER State: CO Zip: 80202		Mobile: ( )
Contact Person: Dan Peterson	Email: rbueuf27@chevron.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 29932 Initial Form 27 Document #: 403438217

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: WELL	Facility ID: _____	API #: 123-30547	County Name: WELD
Facility Name: FIVE RIVERS USX K 09-21D	Latitude: 40.329219	Longitude: -104.787754	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SENW	Sec: 9	Twp: 4N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE	Facility ID: 486717	API #: _____	County Name: WELD
Facility Name: Five Rivers K09-21D	Latitude: 40.325211	Longitude: -104.790912	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWNW	Sec: 9	Twp: 4N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>486718</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Five Rivers K09-21D</u>	Latitude: <u>40.325036</u>	Longitude: <u>-104.791097</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWNW</u>	Sec: <u>9</u>	Twp: <u>4N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>486719</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Five Rivers K09-21D</u>	Latitude: <u>40.324921</u>	Longitude: <u>-104.791418</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWNW</u>	Sec: <u>9</u>	Twp: <u>4N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>486825</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Five Rivers K09-21D</u>	Latitude: <u>40.329192</u>	Longitude: <u>-104.787756</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWNW</u>	Sec: <u>9</u>	Twp: <u>4N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

**SITE CONDITIONS**

General soil type - USCS Classifications SW Most Sensitive Adjacent Land Use Cropland

Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? Yes

Is groundwater less than 20 feet below ground surface? No

**Other Potential Receptors within 1/4 mile**

- Well within Mule Deer Migration Corridor HPH
- Well Within Mule Deer Severe Winter Range HPH
- Well Within Aquatic Native Species Conservation Water HPH
- Well Within Bald Eagle Active Nest Site 0.50mi Buffer HPH
- Well Within Bald Eagle Active Nest Site 0.25mi Buffer HPH
- Bald Eagle Roost Site HPH 0.03mi W
- Riverine 0.12mi E, 0.04mi/ 0.09mi N, 0.1mi/ 0.15mi NE, 0.22mi/ 0.23mi NW
- Freshwater Emergent Wetland 0.21mi NW, 0.24mi S
- Freshwater Pond 0.06mi S, 0.15mi W
- Freshwater Forested/Shrub Wetland 0.09mi NE, 0.23mi NW
- Herbaceous Riparian 0.12mi NW
- Forested/Shrub Riparian 0.21mi W, 0.02mi/ 0.09mi N, 0.15mi NW

# 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
Yes	SOILS	10' x 10' x 3' 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.

Pursuant to ECMC Rule 911 a site investigation was conducted pertaining to the FIVE RIVERS USX K09-21D wellhead cut and cap and flowline removal. Approximately 1563' of flowline was removed. The wellhead was cut and capped per ECMC rules. Additionally, soil samples were field screened at the N-E-S-W sides of the wellhead. Soil samples were taken along the flowline any points of material change and/or hammer unions, directional changes, as well as at the bell holes on either side of a waterway. The Flowline Pre-Abandonment Notice Document number was included under Related Forms.

## 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 ):

A grab soil sample will be collected at the base of the excavation or the area showing the highest degree of impact during field screening activities at the wellhead excavation. Additionally, soil samples will be field screened at the N-E-S-W sides of the wellhead. Soil samples will be taken along the flowline at any points of material change and/or hammer unions, directional changes, as well as at the bell holes on either side of a waterway. Soil samples will be 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. All samples collected will be analyzed by a certified laboratory using approved ECMC laboratory analysis met

### 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 of the wellhead and flowline areas occurred during abandonment activities. Field personnel field screened all disturbed areas using visual and olfactory senses to determine if laboratory confirmation sampling was required. The ECMC Flowline Closure and Wellhead Closure Checklists were utilized and filled out during the abandonment process. A photolog is included on this Form 27.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

Soil

NA / ND

Number of soil samples collected 44 -- Highest concentration of TPH (mg/kg) 1.3  
 Number of soil samples exceeding 915-1 35 -- Highest concentration of SAR 2.02  
 Was the areal and vertical extent of soil contamination delineated? No BTEX > 915-1 No  
 Approximate areal extent (square feet) 100 Vertical Extent > 915-1 (in feet) 9

**Groundwater**

Number of groundwater samples collected 3 -- Highest concentration of Benzene (µg/l) 3.6  
 Was extent of groundwater contaminated delineated? No -- Highest concentration of Toluene (µg/l) 3  
 Depth to groundwater (below ground surface, in feet) 3 -- Highest concentration of Ethylbenzene (µg/l) 17  
 Number of groundwater monitoring wells installed 0 -- Highest concentration of Xylene (µg/l) 130  
 Number of groundwater samples exceeding 915-1 1 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?  
 A total of 8 background samples were collected from four discrete locations and analyzed for arsenic, barium, lead, and pH. Background samples were collected from the same depths as the soil boring samples, and the lithology between the soil boring and background locations were observed to be generally poorly to well graded sands. The maximum background concentration of pH was observed to be 9.18, and the maximum background concentration of arsenic, barium, and lead with a 1.25 multiplier applied were calculated to be 2.73 mg/kg, 170 mg/kg, and 14.9 mg/kg. Since the background concentrations for pH exceed all remedial excavation confirmation and decommissioning soil sample results, pH should not be considered a contaminant of concern. Additional sampling and analysis will be performed to determine if arsenic, barium, lead, and selenium should be considered contaminants of concern.

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?  
 Due to the presence of impacted groundwater identified in the FL01-M excavation, additional remedial excavation activities will not be continued at this time, and six groundwater monitoring wells will be installed to delineate the extent of the impacts. A proposed soil boring and groundwater monitoring well locations map is attached to this Form 27. Soil samples will be collected from the soil borings and analyzed for Organic Compounds in Soil per ECMC Table 915-1, arsenic, barium, lead, and selenium.

**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.  
 The sources identified at FL01-A, FL01-L, FL01-M, and FL01-N are in the process of removal through a remedial excavation, as described in the Remediation Summary section below. Remedial excavation confirmatory samples were collected and analyzed in accordance with the amended sampling plan approved under ECMC document #403785499.  
 A detailed discussion regarding the management of the releases identified at FL01-J (Spill ID 486555), FL01-I (Spill ID 486554), FL01-H (Spill ID 486547), FL01D (Spill ID 486553), and FL01-C (Spill ID 486552) was submitted to the ECMC under Form 27 document #403785499.

**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.

Remedial excavation activities were conducted in July and August 2024, to address observed exceedances at FL01-A, FL01-L, FL01-M, and FL01-N. After removal of 1,470 cubic yards of impacted soils and 11,930 BBLS of groundwater infiltration into the excavations, excavation activities were paused due to the large influx of groundwater into the excavations. Additional remedial excavation activities are still needed to address exceedances observed at sample locations FS02-FL01-A@5' and SS01-FL01-N@3'.

Due to the presence of impacted groundwater identified in the FL01-M excavation, additional remedial excavation activities will not be continued at this time, and six groundwater monitoring wells will be installed to delineate the extent of the impacts. A proposed soil boring and groundwater monitoring well locations map is attached to this Form 27. Soil samples will be collected from the soil borings and analyzed for Organic Compounds in Soil per ECMC Table 915-1, arsenic, barium, lead, and selenium.

**Soil Remediation Summary**

In Situ

Ex Situ

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

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

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

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) 1470

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

\_\_\_\_\_ Name of Licensed Disposal Facility or ECMC Facility ID # \_\_\_\_\_

\_\_\_\_\_ Natural Attenuation

\_\_\_\_\_ No Excavate and onsite remediation

\_\_\_\_\_ Other \_\_\_\_\_

\_\_\_\_\_ Land Treatment

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

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

\_\_\_\_\_ Other \_\_\_\_\_

**Groundwater Remediation Summary**

\_\_\_\_\_ No Bioremediation ( or enhanced bioremediation )

\_\_\_\_\_ No Chemical oxidation

\_\_\_\_\_ No Air sparge / Soil vapor extraction

\_\_\_\_\_ No Natural Attenuation

\_\_\_\_\_ Yes Other Pumped and transported 11,930 BBLS to NGL C3 for disposal

**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.

After the final extent of the excavations are completed, monitoring wells will be proposed within each excavation area where groundwater infiltration was observed along with proposed monitoring wells outside of the excavation areas. Proposed groundwater monitoring wells will be proposed on a subsequent Supplemental Form 27.

# 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 Remedial Excavation Report

## 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:

Volume of E&P Waste (solid) in cubic yards 1470

E&P waste (solid) description Hydrocarbon impacted soils

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

Non-ECMC Disposal Facility: Waste Management Ault

Volume of E&P Waste (liquid) in barrels 11930

E&P waste (liquid) description Groundwater in contact with impacted soils within the excavations

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

Non-ECMC Disposal Facility: NGL C3

# 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 COGCC 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. 02/09/2025

Proposed date of completion of Reclamation. 02/09/2028

## 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. 06/06/2023

Actual Spill or Release date, or date of discovery. 05/09/2024

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/21/2024

Proposed site investigation commencement. 05/23/2024

Proposed completion of site investigation. 11/23/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/23/2024

Proposed date of completion of Remediation. 11/23/2025

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:

Proposed completion of site investigation date is being updated to reflect the schedule to complete decommissioning activities and the remedial excavation. The ECMC will be updated on a subsequent Form 27 with the results of the continued remedial excavation and proposed groundwater monitoring plan, or if the schedule is changed due to site access constraints.

## OPERATOR COMMENT

This Form 27 is being submitted to include the remedial excavation activities performed at the Five Rivers K09-21D site. A comprehensive data packet summarizing the remedial excavation activities is attached to this Form 27, and a detailed summary of the remedial excavation activities is presented in the Remedial Action Plan sections and below.

A total of 8 background samples were collected from four discrete locations and analyzed for arsenic, barium, lead, and pH. Background samples were collected from the same depths as the soil boring samples, and the lithology between the soil boring and background locations were observed to be generally poorly to well graded sands. The maximum background concentration of pH was observed to be 9.18, and the maximum background concentration of arsenic, barium, and lead with a 1.25 multiplier applied were calculated to be 2.73 mg/kg, 170 mg/kg, and 14.9 mg/kg. Since the background concentrations for pH exceed all remedial excavation confirmation and decommissioning soil sample results, pH should not be considered a contaminant of concern.

Remedial excavation activities were conducted in July and August 2024, to address observed exceedances at FL01-A, FL01-L, FL01-M, and FL01-N. After removal of 1,470 cubic yards of impacted soils and 11,930 BBLs of groundwater infiltration into the excavations, excavation activities were paused due to the large influx of groundwater into the excavations. Additional remedial excavation activities are still needed to address exceedances observed at sample locations FS02-FL01-A@5' and SS01-FL01-N@3'

Due to the presence of impacted groundwater identified in the FL01-M excavation, additional remedial excavation activities will not be continued at this time, and six groundwater monitoring wells will be installed to delineate the extent of the impacts. A proposed soil boring and groundwater monitoring well locations map is attached to this Form 27. Soil samples will be collected from the soil borings and analyzed for Organic Compounds in Soil per ECMC Table 915-1, arsenic, barium, lead, and selenium.

Quarterly reporting will continue until closure criteria are achieved for this remediation project.

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

Signed: Allan Engelhardt

Title: Environmental Consultant

Submit Date: 10/02/2024

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: Nick Cholas

Date: 01/08/2025

Remediation Project Number: 29932

## COA Type

## Description

COA Type	Description
0 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
403939375	FORM 27-SUPPLEMENTAL-SUBMITTED
403939599	ANALYTICAL RESULTS
403939600	ANALYTICAL RESULTS
403939601	ANALYTICAL RESULTS
403939602	ANALYTICAL RESULTS
403943981	REMEDATION PROGRESS REPORT
403943982	SITE INVESTIGATION PLAN

Total Attach: 7 Files

## General Comments

User Group	Comment	Comment Date
Environmental	Operator shall continue Quarterly Reporting until the Site Assessment is completed and the remediation area demonstrates Compliance with Table 915-1 Standards.	01/08/2025

Total: 1 comment(s)