

State of Colorado
Oil and Gas Conservation Commission

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Document Number:
401880513
Receive Date:
12/19/2018

Report taken by:
CHRIS CANFIELD

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATON

Name of Operator: NOBLE ENERGY INC	Operator No: 100322	Phone Numbers
Address: 1001 NOBLE ENERGY WAY		Phone: (970) 3045329
City: HOUSTON State: TX Zip: 77070		Mobile: ()
Contact Person: Jacob Evans	Email: jacob.evans@nblenergy.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 8440 Initial Form 27 Document #: 2148980

PURPOSE INFORMATION

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

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

Facility Type: LOCATION	Facility ID: 376820	API #: _____	County Name: ADAMS
Facility Name: FRI-61S67W 18CSE	Latitude: 39.960989	Longitude: -104.926653	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: CSE	Sec: 18	Twp: 1S	Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use CROP LAND

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? No

Other Potential Receptors within 1/4 mile

SURFACE WATER 640' E, WATER WELL 836' N.

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
Yes	GROUNDWATER	~53,500 SQUARE FEET	Lab Analytical
Yes	SOILS	~367,500 CUBIC FEET	Lab Analytical

INITIAL ACTION SUMMARY

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

SEE FORM 19, COGCC DOCUMENT #2147193.

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):

Soil samples were collected as part of the site investigation and analyzed for TPH-GRO, TPH-DRO, Naphthalene, and BTEX.

Proposed Groundwater Sampling

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

Groundwater samples were collected as part of the site investigation and analyzed for BTEX. Groundwater monitoring will be scheduled on a quarterly basis. Point of compliance has been achieved at the location.

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):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 33

Number of soil samples exceeding 910-1 6

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 52000

NA / ND

-- Highest concentration of TPH (mg/kg) 1859

NA Highest concentration of SAR

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 53

Groundwater

Number of groundwater samples collected 42

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 29'

Number of groundwater monitoring wells installed 42

Number of groundwater samples exceeding 910-1 24

-- Highest concentration of Benzene (µg/l) 15000

-- Highest concentration of Toluene (µg/l) 33000

-- Highest concentration of Ethylbenzene (µg/l) 1200

-- Highest concentration of Xylene (µg/l) 18000

NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected

0 Number of surface water samples exceeding 910-1

If surface water is impacted, other agency notification may be required.

OTHER INVESTIGATION INFORMATION

Were impacts to adjacent property or offsite impacts identified?

Were background samples collected as part of this site investigation?

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

Volume of solid waste (cubic yards)

Volume of liquid waste (barrels)

Is further site investigation required?

POINT OF COMPLIANCE SAMPLES COLLECTED ARE IN COMPLIANCE WITH COGCC REGULATIONS. POINT OF COMPLIANCE HAS BEEN ACHIEVED ON THE UPGRADIENT, DOWN GRADIENT, AND CROSS GRADIENT AREAS OF THE SITE. ADDITIONAL GROUNDWATER SAMPLING WILL BE CONDUCTED ON A QUARTERLY BASIS.

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.

IMPACTED SOILS WERE REMOVED DURING SITE DECOMMISSIONING ACTIVITIES IN 2005, AS DESCRIBED IN COGCC DOCUMENT #1139858. INTERIM REMEDIAL ACTIONS CURRENTLY UNDERWAY CONSIST OF LNAPL RECOVERY USING AUTOMATED AND MANUAL RECOVERY TECHNIQUES. AUTOMATED LNAPL RECOVERY PUMPS ARE CURRENTLY INSTALLED IN FOUR SITE MONITORING WELLS (PR01, PR02, SB05, AND SB30). ADDITIONAL RECOVERY WELLS WILL BE INSTALLED TO OPTIMIZE LNAPL RECOVERY AT THE SITE. FOLLOWING THE CONCLUSION OF SOURCE REMOVAL ACTIVITIES, DISSOLVED IMPACTS WILL BE ADDRESSED

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.

LNAPL recovery wells were installed and are operational. Additional total fluid recovery pumps have also been installed and are operational. The soil vapor extraction system has been activated and is currently removing mass.

Soil Remediation Summary

In Situ

Ex Situ

No Bioremediation (or enhanced bioremediation)

Excavate and offsite disposal

No Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____

Yes Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC Facility ID # _____

Yes Natural Attenuation

Excavate and onsite remediation

No Other _____

No Land Treatment

No Bioremediation (or enhanced bioremediation)

No Chemical oxidation

No Other _____

Groundwater Remediation Summary

No Bioremediation (or enhanced bioremediation)

No Chemical oxidation

No Air sparge / Soil vapor extraction

Yes Natural Attenuation

Yes Other LNAPL Recovery wells/Total
Fluid Recovery _____

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.

Monitoring wells SB03, SB04, SB06, SB07, SB08, SB10, SB11, SB12, SB13, SB14, SB15, SB17, SB19, SB20, SB22R, SB25R, SB27R, SB28R, SB36, SB38, and SB39 will be sampled on a quarterly basis. Groundwater samples will be collected by Tasman Geosciences and transported to Summit Scientific under proper chain of custody procedures and analyzed for BTEX by EPA Method 8260b.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other _____
Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other _____

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:

No beneficial use

Volume of E&P Waste (solid) in cubic yards _____ 0

E&P waste (solid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

Volume of E&P Waste (liquid) in barrels _____ 184

E&P waste (liquid) description Impacted groundwater above
COGCC Table 910-1 standards _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: NGL _____

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No _____

Do all soils meet Table 910-1 standards? No _____

Does the previous reply indicate consideration of background concentrations? _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? No _____

Does Groundwater meet Table 910-1 standards? No _____

Is additional groundwater monitoring to be conducted? Yes _____

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.

FINAL RECLAMATION ACTIVITIES WILL BE DEVELOPED IN CONJUNCTION WITH THE PROPERTY OWNER BASED ON USE OR ANTICIPATED USE AT THE TIME OF FINAL RECLAMATION. IN ADDITION, SUBSEQUENT TO RECEIPT OF A NO FURTHER ACTION (NFA) DESIGNATION, THE MONITORING WELLS AND REMEDIATION WELLS WILL BE PROPERLY PLUGGED AND ABANDONED PER COLORADO DIVISION OF WATER RESOURCES STANDARDS.

Is the described reclamation complete? Yes _____

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

Interim? Final?

Did the Surface Owner approve the seed mix? _____

If NO, does the seed mix comply with local soil conservation district recommendations? _____

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. _____

Actual Spill or Release date, if known. 11/04/2013

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). _____

Date of commencement of Site Investigation. 11/04/2013

Date of completion of Site Investigation. 04/21/2014

REMEDIAL ACTION DATES

Date of commencement of Remediation. 11/12/2013

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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

Signed: Jacob Evans

Title: Environmental Coordinator

Submit Date: 12/19/2018

Email: jacob.evans@nblenergy.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: CHRIS CANFIELD

Date: 01/10/2019

Remediation Project Number: 8440

COA Type

Description

<u>COA Type</u>	<u>Description</u>

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

401880513	FORM 27-SUPPLEMENTAL-SUBMITTED
401880516	MONITORING REPORT

Total Attach: 2 Files

General Comments

User Group

Comment

Comment Date

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)