

State of Colorado
Oil and Gas Conservation Commission

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Document Number:
401984283
Receive Date:
03/26/2019

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: <u>CARRIZO NIOBRARA LLC</u>	Operator No: <u>10439</u>	Phone Numbers
Address: <u>500 DALLAS STREET #2300</u>		Phone: <u>(713) 358-6227</u>
City: <u>HOUSTON</u>	State: <u>TX</u>	Zip: <u>77002</u>
Contact Person: <u>Eric Johansson</u>	Email: <u>eric.johansson@carrizo.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 9711 Initial Form 27 Document #: 2526436

PURPOSE INFORMATION

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input 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: <u>PIT</u>	Facility ID: <u>114107</u>	API #: _____	County Name: <u>ADAMS</u>
Facility Name: <u>CUSTY 1</u>	Latitude: <u>39.872691</u>	Longitude: <u>-104.769567</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSW</u>	Sec: <u>15</u>	Twp: <u>2S</u>	Range: <u>66W</u>
Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use RESIDENTIAL

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

DWR WELL PERMIT #105682, KENNETH J CUSTY, DOMESTIC WELL, ~425' NW, WELL IS PERFORATED 220 TO 360' BEL

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 type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | _____ |
| <input checked="" type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input 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 checked="" type="checkbox"/> Other (as described by EPA) | | Impacted soil & groundwater |

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
No	GROUNDWATER	0' by 0'	Lab results
No	SOILS	0' by 0'	Lab results

INITIAL ACTION SUMMARY

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

Facility was shut-in, documented on Form 19 submitted on 6/17/16. The portion of the dump line that contained a small hole was identified, removed and capped.

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 impacts at the site have been addressed via excavation activities.

Proposed Groundwater Sampling

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

Groundwater samples from MW-1R, MW-02 through MW-05, MW-06R, MW-07R, MW-08, MW-09, MW-13R, MW-14 will be collected during the 4th quarter 2018 groundwater sampling event which will be completed on December 3, 2018. The same network of monitoring wells will be sampled during the 1st quarter 2019 groundwater sampling event which will be completed on March 1, 2019.

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 37
Number of soil samples exceeding 910-1 10
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 20

NA / ND

-- Highest concentration of TPH (mg/kg) 4320
NA Highest concentration of SAR
BTEX > 910-1 Yes
Vertical Extent > 910-1 (in feet) 7

Groundwater

Number of groundwater samples collected 109
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 10'
Number of groundwater monitoring wells installed 14
Number of groundwater samples exceeding 910-1 23

-- Highest concentration of Benzene (µg/l) 3800
-- Highest concentration of Toluene (µg/l) 5400
-- Highest concentration of Ethylbenzene (µg/l) 210
-- Highest concentration of Xylene (µg/l) 5000
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) 1338 Volume of liquid waste (barrels) 15

Is further site investigation required?

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 excavation activities were completed at the site from 6/17/16 through 6/22/16, 8/15/17 through 8/18/17, and 4/10/18.

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.

Monitored natural attenuation (MNA) is the remedial path for the site moving forward. Continued groundwater monitoring will be completed on December 3, 2018 and March 1, 2019.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____

_____ Air sparge / Soil vapor extraction

_____ Name of Licensed Disposal Facility or COGCC Facility ID # _____

Yes _____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ Land Treatment

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Other _____

Groundwater Remediation Summary

No _____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

No _____ 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.

Groundwater samples from MW-1R, MW-02 through MW-05, MW-06R, MW-07R, MW-08, MW-09, MW-13R, MW-14 will be collected during the 4th quarter 2018 groundwater sampling event which will be completed on December 3, 2018. The same network of monitoring wells will be sampled during the 1st quarter 2019 groundwater sampling event which will be completed on March 1, 2019. Groundwater will be analyzed for BTEX following EPA Method 8260.

REMEDATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other _____

Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report

Other Closure report _____

WASTE DISPOSAL INFORMATION

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

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

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

E&P waste (solid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

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

E&P waste (liquid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

REMEDATION COMPLETION REPORT

REMEDATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? Yes _____

Do all soils meet Table 910-1 standards? Yes _____

Does the previous reply indicate consideration of background concentrations? Yes _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? _____

Does Groundwater meet Table 910-1 standards? Yes _____

Is additional groundwater monitoring to be conducted? No _____

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.

Following receipt of a no further action from the state, the monitoring wells will be abandoned per the DWR guidelines and the site will be reclaimed per the COGCC 1000 series regulations.

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 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. _____

SITE INVESTIGATION DATES

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

Date of commencement of Site Investigation. 06/17/2016

Date of completion of Site Investigation. 06/27/2016

REMEDIAL ACTION DATES

Date of commencement of Remediation. 06/17/2016

Date of completion of Remediation. 03/01/2019

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: Eric Johansson

Title: EH&S Supervisor

Submit Date: 03/26/2019

Email: eric.johansson@carrizo.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: 04/02/2019

Remediation Project Number: 9711

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

401984283	FORM 27-SUPPLEMENTAL-SUBMITTED
401984317	MONITORING REPORT

Total Attach: 2 Files

General Comments

User Group

Comment

Comment Date

Environmental	Based on the information presented, it appears that no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required. In addition, the surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.	04/02/2019
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Total: 1 comment(s)