

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
RICK ALLISON

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: 8 NORTH LLC	Operator No: 10575	Phone Numbers
Address: 370 17TH STREET SUITE 5200		Phone: (720) 3544616
City: DENVER State: CO Zip: 80202		Mobile: (570) 9320776
Contact Person: Nathan Bennett	Email: nbennett@extractionog.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 16943 Initial Form 27 Document #: 402598030

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: Facility decommissioning in support of final reclamation. Well P&A. Form 6 filed and approved.

SITE INFORMATION

Yes Multiple Facilities

Facility Type: WELL	Facility ID: _____	API #: 123-32493	County Name: WELD
Facility Name: Pawnee 16-13H	Latitude: 40.835220	Longitude: -103.992170	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWSW	Sec: 16	Twp: 10N	Range: 59W Meridian: 6 Sensitive Area? Yes

Facility Type: LOCATION	Facility ID: 420186	API #: _____	County Name: WELD
Facility Name: Pawnee 16-13H	Latitude: 40.835220	Longitude: -103.992170	
** correct Lat/Long if needed: Latitude: 40.835391		Longitude: _____	
QtrQtr: NWSW	Sec: 16	Twp: 10N	Range: 59W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM

Most Sensitive Adjacent Land Use Rangeland.

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

High Priority Habitats: Mule deer severe winter range, swift fox overall range.

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	SOILS	See attached Site Diagram	Laboratory 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.

This form has been prepared to support the plugging and abandonment of an oil and gas well, as well as the removal of the production equipment associated with this location. A Form 6-Intent (Doc#402533142) has been filed and approved. In accordance with COGCC Rule 911 and Rule 915, initial representative soil samples, and groundwater samples if present, will be collected beneath the wellhead, the separator, the produced water vessel. Initial laboratory soil analysis will include only BTEX, 1,2,4 and 1,3,5 Trimethylbenzene, naphthalene, TPH and pH, EC, SAR and Boron. Other equipment such as the ECD(s), meter sheds or other qualifying equipment will be field screened, and a lab analysis submitted if impacts are identified. Identified impacts will be reported as required for each discovery, and a Form 19 will be submitted, and remedial investigation will be conducted with excavation equipment.

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):

In accordance with COGCC Rule 911 and Rule 915 soil samples will be collected during closure of each qualifying equipment type and/or field screened as described in the Initial Action Summary. Initial laboratory analysis will include only BTEX, 1,2,4 and 1,3,5 Trimethylbenzene, naphthalene, TPH and pH, EC, SAR and Boron. If impacts are confirmed, the full Table 915-1 list of analysis will be tested for and additional excavation effort may be conducted to delineate horizontal and vertical extents. Overburden stockpiles, if present, will be sampled prior to use as backfill with a frequency of 1 composite sample per 500 cubic yards of material and submitted for analysis of VOCs.

Proposed Groundwater Sampling

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

If groundwater is encountered during excavation activities, one sample will be collected and analyzed for Table 915-1 groundwater constituents.

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

NA / ND

Number of soil samples collected 28 -- Highest concentration of TPH (mg/kg) 104.9
 Number of soil samples exceeding 915-1 24 -- Highest concentration of SAR 6.61
 Was the areal and vertical extent of soil contamination delineated? No BTEX > 915-1 No
 Approximate areal extent (square feet) 0 Vertical Extent > 915-1 (in feet) 0

Groundwater

Number of groundwater samples collected 0 Highest concentration of Benzene (µg/l) _____
 Was extent of groundwater contaminated delineated? No Highest concentration of Toluene (µg/l) _____
 Depth to groundwater (below ground surface, in feet) _____ Highest concentration of Ethylbenzene (µg/l) _____
 Number of groundwater monitoring wells installed _____ Highest concentration of Xylene (µg/l) _____
 Number of groundwater samples exceeding 915-1 _____ 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?
 Soil samples were collected from native soils in areas undisturbed by oil and gas activities and were analyzed for soil suitability and 915-1 metals. See samples BKG01@6", BKG02@1', BKG03@1.5', BKG04@1', and BKG05@1'.

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?

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.
 Once high pH was discovered in the area of the above ground storage tanks (ASTs) and high pH and arsenic at the wellhead, additional excavations were conducted to determine the extent of inorganic exceedance soils. Excavated soils and bedrock was stockpiled onsite and sampled. No material was transported from the location for disposal. Soil samples collected and analyzed for pH and arsenic show elevated levels above background samples. A site specific reclamation plan has been prepared with considerations for soil suitability present at this site. See attached Reclamation Plan

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.

In accordance with COGCC Rule 911 and Rule 915, representative surface soil samples were collected beneath the separators, heater treaters, wellheads, and above-ground storage tanks (AST). Other equipment such as the meter shed and flowlines were field screened using a photoionization detector (PID). There was no exceedances of hydrocarbon constituents detected in any of the samples. The final heater treater, and wellhead base samples exceeded Table 915-1 allowable limits for arsenic ranging from 2.3 to 3.4 mg/kg. A site specific calculation of natural arsenic concentrations was determined from five background samples. This was calculated by finding the range of the analytical results for the five background samples collected multiplied by 1.25, equaling 0.798 to 3.13 mg/kg. This demonstrates a high variability of arsenic concentrations in native soil. Given this range, sample HT02@1' was slightly above the background arsenic range with a result of 3.4mg/kg. Several samples exceeded the Table 915-1 allowable limits for pH including: AST01@6", AST02@6", AST03@6", AST04@6", HT01@6", B01@8', ASTB01@2', ASTB02@2', ASTB03@2', ASTB04@2', ASTB05@2', AST STOCK01, ASTSTOCK 01, Well B01@10', Well S01@8', Well E01@8', Well W01@8', Well Stock 01, and Well Stock 02. A site specific reclamation plan has been prepared with considerations for soil suitability present at this site. See attached Reclamation Plan. Because there is no evidence of hydrocarbon impacts at this location, groundwater is estimated to be below 20ft bgs, shallow compacted bedrock was encountered underneath the location pad surface, and no other inorganic exceedances, those samples which exceed the protection of groundwater soil screening level concentrations risk based (R) or MCL based (M) are not a threat to groundwater.

Soil Remediation Summary

In Situ

_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Air sparge / Soil vapor extraction
_____ Natural Attenuation
_____ Other _____

Ex Situ

_____ Excavate and offsite disposal
_____ If Yes: Estimated Volume (Cubic Yards) _____
_____ 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
_____ 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.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

Quarterly Semi-Annually Annually Other Final Report

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 NFA Request

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: _____

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

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

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? No _____

Does the previous reply indicate consideration of background concentrations? _____

Does Groundwater meet Table 915-1 standards? Yes _____

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.

Reclamation activities will be completed in accordance with 1000 Series Rules, in collaboration with the landowner, and reported in a Form 4 (Sundry Notice) with proper documentation to demonstrate compliance with requirements for final reclamation. A site specific reclamation plan has been prepared with considerations for soil suitability present at this site. See attached Reclamation Plan

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? No

If YES, does the seed mix comply with local soil conservation district recommendations? _____

Did the local soil conservation district provide the seed mix? Yes

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. 02/04/2021

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/28/2021

Proposed site investigation commencement. 04/23/2021

Proposed completion of site investigation. 06/18/2021

REMEDIAL ACTION DATES

Proposed start date of Remediation. _____

Proposed date of completion of Remediation. _____

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 form has been prepared to document successful removal of the production equipment associated with this location. Residential screening levels were utilized at this location based on nearby groundwater monitoring wells registering static water levels deeper than 20 feet below ground surface. Analytical results from five tested samples are in exceedance of the Table 915-1 residential screening level for arsenic (0.68 mg/Kg), with results ranging from 2.3 to 2.94 mg/Kg, and the highest concentration found at 10-feet below ground surface. Five representative background samples collected from nearby native soils indicate that typical arsenic values range from 0.638 to 2.51 mg/Kg, demonstrating highly variable concentrations of naturally occurring arsenic in the area. Analytical results from 19 samples are in exceedance of the Table 915-1 screening range for pH (6-8.3) with results ranging from 8.39 to 9.3. Native soil conditions and shallow compact bedrock at this site are the suspected source of both the elevated arsenic and higher pH as no spills or releases are known to have occurred. The native soils within the Badland soil formation have an average pH of 8.89. Data in the Reclamation Plan shows a strong correlation to elevation and pH: The lower the elevation the higher the pH. These pH values reflect the environmental and soil development conditions present in the Pawnee National Grasslands. These site conditions have been taken into consideration when preparing the site specific reclamation activities proposed in the attached Reclamation Plan. Please find the attached Reclamation Plan, Topographic Map, Site Diagram, Closure Checklist, Photolog, Lab Results Summary Table, and Laboratory Analytical Results.

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

Signed: Maggie Graham

Title: Senior Project Manager

Submit Date: 08/19/2021

Email: Maggie.Graham@apexc.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: RICK ALLISON

Date: 11/12/2021

Remediation Project Number: 16943

Condition of Approval

COA Type

Description

	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.
1 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

402761289	FORM 27-SUPPLEMENTAL-SUBMITTED
402785793	OTHER
402785803	RECLAMATION PLAN

Total Attach: 3 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Reclamation Specialist	Soil sample analytical results indicate that the pH of soil from the pad and overburden area (location) are above the Table 915-1 Soil Suitability Level of 8.3, averaging 8.67-8.90. However, soil sample analytical results also indicate that the pH of soil from background (native soils) are above the Table 915-1 Soil suitability Level of 8.3, averaging 8.39-8.89. Since the average pH of soil from the location are representative of the background, there does not appear to be any limitation for reclamation success. COGCC will not require further action at this time. 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/reclamation activities may be required.	11/12/2021
Environmental	Added "Rule 915.b: Request to leave elevated inorganics in situ." to Purpose Section. Changed Remediation Complete to Compliant with Rule 913.h.(1). considering background concentrations. Removed Compliant with Rule 913.h.(2). Rule 913.h.(2) refers to a rule variance. no variance has been granted.	09/09/2021
Environmental	Background samples analyzed for arsenic indicate a high degree of variability in arsenic at the location. In addition, no known or suspected Spills or Releases have occurred at the location. Therefore, COGCC agrees arsenic concentrations in background samples are likely a result of naturally occurring arsenic variability in native material.	09/09/2021
Environmental	Assigned Reclamation Specialist a review task for Reclamation Plan review	09/09/2021

Total: 4 comment(s)