FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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Document Number: 401800285
Receive Date: 02/05/2019
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: EXTRACTION OIL & GAS INC Operator No: 10459
Address: 370 17TH STREET SUITE 5300
City: DENVER State: CO Zip: 80202
Contact Person: Blake Ford Email: bford@ExtractionOG.com

Phone Numbers
Phone: (720) 481-2362
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 3858 Initial Form 27 Document #: 1396769

PURPOSE INFORMATION

- [ ] 901.e. Sensitive Area Determination
- [x] 909.c.(1), Rule 905: Pit or PW vessel closure
- [x] 909.c.(2), Rule 906: Spill/Release Remediation
- [ ] 909.c.(3), Rule 907.e.: Land treatment of oily waste
- [ ] 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure
- [ ] 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
- [ ] Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
- [ ] Rule 909.e.(2)B.: Closure of remediation project
- [ ] Rule 906.c.: Director request
- [x] Other Facility decommissioning in support of final reclamation.

SITE INFORMATION

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

Facility Type: LOCATION Facility ID: 323253 API #: County Name: WELD
Facility Name: BERGER-62N68W 23SENE Latitude: 40.125952 Longitude: -104.962736
** correct Lat/Long if needed: Latitude: 40.127334 Longitude: -104.961316
QtrQtr: SENE Sec: 23 Twp: 2N Range: 68W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM
Most Sensitive Adjacent Land Use CROPLAND
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

Residential area

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [x] **E&P Waste**
  - [x] Produced Water
  - [x] Oil
  - [ ] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
No	GROUNDWATER	Approx. 380'(L) x 133'(W) x 12'(D)	Laboratory results
Yes	SOILS	Approx. 380'(L) x 133'(W) x 12'(D)	Field screening and laboratory result

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 closure the historical impacts associated with the COGCC assigned Remediation Project No. 3858. The investigation and remediation of remaining impacts was conducted using conventional excavation. Field screening of disturbed soils was conducted during excavation activities and samples were collected for laboratory analysis.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[x] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

In response to historical impacts from the previous operator that were uncovered during reclamation activities, soil samples will be collected from the extents of the excavation directly and submitted for laboratory analysis of organic (TPH and BTEX) and inorganic (SAR, EC and pH) constituents of concern. If a release is discovered through field-screening or laboratory analysis, the base and sidewall samples will be analyzed to direct additional excavations and further delineate impacts horizontally and vertically. Subsequent soil samples will be analyzed for any constituents of concern above allowable limits that were identified in the initial round of samples, until the areal and vertical extents of the excavation are within COGCC Table 910-1 allowable limits.

Proposed Groundwater Sampling

[x] 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 BTEX. Additional groundwater samples will be collected if groundwater impacts are identified, if a larger in-situ characterization is necessary, or if long term remedial strategies are necessary.

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: 84

Number of soil samples exceeeding 910-1: 14

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

Approximate areal extent (square feet): 50540

NA / ND

-- Highest concentration of TPH (mg/kg): 15700

-- Highest concentration of SAR: 1.96

BTEX > 910-1: Yes

Vertical Extent > 910-1 (in feet): 10

Groundwater

Number of groundwater samples collected: 4

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet): 11`

Number of groundwater monitoring wells installed: 0

Number of groundwater samples exceeding 910-1: 1

-- Highest concentration of Benzene (µg/l): 6

ND Highest concentration of Toluene (µg/l):

-- Highest concentration of Ethylbenzene (µg/l): 10

-- Highest concentration of Xylene (µg/l): 68

NA Highest concentration of Methane (mg/l):

Surface Water

0 Number of surface water samples collected

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?

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Once a release was confirmed with laboratory results, additional excavation was conducted, and approximately 13,355 cubic yards of impacted soil was removed and transported to a disposal facility. Soil samples were collected and analyzed for organic constituents (TPH and BTEX) and inorganics (SAR, EC and pH) until the areal and vertical extents of the excavation were within COGCC Table 910-1 allowable limits..

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.

Conventional excavation was conducted in response to historical impacts from the previous operator that were uncovered during reclamation activities. Field-screening and laboratory analysis of soil samples from the base and sidewalls of the excavation were used direct additional excavations and further delineate impacts horizontally and vertically. Samples were analyzed for organic (TPH and BTEX) and inorganic (SAR, EC and pH) constituents of concern, until the areal and vertical extents of the excavation were within COGCC Table 910-1 allowable limits. Groundwater was encountered during the investigation, and an initial sample was collected. Groundwater that had been in contact with impacted source material was pumped out of the excavation to enable the complete removal of impacted soil underneath and was disposed of at an approved disposal facility. Once source removal was complete, the excavation was dewatered a final time and allowed to recharge with fresh, representative groundwater before collecting 3 subsequent samples of groundwater. Laboratory results for the final groundwater samples were within allowable limits for COGCC Table 910-1 constituents of concern (BTEX).

Soil Remediation Summary

☐ **In Situ**

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

☒ **Ex Situ**

- Yes Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) 13355
  - 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

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? _____

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

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

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.

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.

Is the described reclamation complete? _____

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). 01/09/2007

Date of commencement of Site Investigation. 02/21/2018

Date of completion of Site Investigation. 04/20/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 02/21/2018

Date of completion of Remediation. 04/20/2018

SITE RECLAMATION DATES

Date of commencement of Reclamation.

Date of completion of Reclamation.

OPERATOR COMMENT

This form has been prepared to document successful closure of Remediation Project 3858 at this location. Please find attached a work completion report for a description of site investigation activities and findings, including lab 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:` 02/05/2019 Email: maggie.graham@apexcos.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: 02/13/2019

Remediation Project Number: 3858

COA Type	Description

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
401800285	FORM 27-SUPPLEMENTAL-SUBMITTED
401930601	OTHER

Total Attach: 2 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)