

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.

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

OPERATOR INFORMATION

Name of Operator: <u>EXTRACTION OIL & GAS INC</u>	Operator No: <u>10459</u>	Phone Numbers Phone: <u>(720) 4812362</u> Mobile: <u>()</u>
Address: <u>370 17TH STREET SUITE 5300</u>		
City: <u>DENVER</u>	State: <u>CO</u> Zip: <u>80202</u>	
Contact Person: <u>Blake Ford</u>	Email: <u>bford@extractionOG.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 11742Initial Form 27 Document #: 401740688

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 checked="" 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 checked="" type="checkbox"/> Other <u>Facility decommissioning in support of final reclamation.</u> |

SITE INFORMATION

Y Multiple Facilities (in accordance with Rule 909.c.)

Facility Type: <u>LOCATION</u>	Facility ID: <u>318027</u>	API #: <u></u>	County Name: <u>WELD</u>
Facility Name: <u>CANAL-67N67W 34NWNE</u>		Latitude: <u>40.536132</u>	Longitude: <u>-104.877136</u>
		** correct Lat/Long if needed: Latitude: <u>40.533377</u>	Longitude: <u>-104.873261</u>
QtrQtr: <u>NWNE</u>	Sec: <u>34</u>	Twp: <u>7N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SMMost Sensitive Adjacent Land Use CroplandIs domestic water well within 1/4 mile? NoIs surface water within 1/4 mile? YesIs groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Residential area, Windsor Reservoir

SITE INVESTIGATION PLAN

TYPE OF WASTE:

☒ E&P Waste

☐ Other E&P Waste

☐ Non-E&P Waste

☒ Produced Water

☐ Workover Fluids

☐ Oil

☐ Tank Bottoms

☐ Condensate

☐ Pigging Waste

☐ Drilling Fluids

☐ Rig Wash

☐ Drill Cuttings

☐ Spent Filters

☐ Pit Bottoms

☐ Other (as described by EPA)

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	(366' x 172' x 12')	Laboratory 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.

This form has been prepared to support decommissioning and removal of the well site and production equipment associated with final reclamation of this location. In accordance with COGCC Rule 905.b, soil samples, and groundwater samples if present, will be collected during closure of the buried or partially buried produced water vessels to assure compliance with COGCC Table 910-1 allowable limits. The initial investigation will be conducted using excavation equipment. Field screening of disturbed soils will be conducted during equipment removal and plugging and abandonment (P&A) activities, and samples will be collected for laboratory analysis if any indications of impacts are identified. Identified impacts will be reported as required for each discovery, and a Form 19 will be submitted.

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):

If no suspected release is identified, one discrete grab soil sample will be collected from directly beneath the water vessel upon removal and submitted for laboratory analysis of organic constituents (TPH and BTEX) and inorganics (SAR, EC and pH). If a release is discovered and confirmed through soil screening and/or laboratory analysis, and/or groundwater is encountered during removal activities, additional excavations may be conducted to further delineate horizontally and vertically. If the extent of impacts is reached and/or remaining impact analytical results are needed for future remediation activities, discrete soil samples will be collected from the sidewalls and base (if groundwater is not present) and analyzed for organic (TPH and BTEX) and inorganic (SAR, EC and pH) constituents.

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 BTEX.

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 142

Number of soil samples exceeding 910-1 48

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

Approximate areal extent (square feet) 43767

NA / ND

-- Highest concentration of TPH (mg/kg) 13100

-- Highest concentration of SAR 35.5

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 10

Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) \

Number of groundwater monitoring wells installed

Number of groundwater samples exceeding 910-1

Highest concentration of Benzene (µg/l)

Highest concentration of Toluene (µg/l)

Highest concentration of Ethylbenzene (µg/l)

Highest concentration of Xylene (µg/l)

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?

Property to the North was excavated to remove hydrocarbon impacts. No further hydrocarbon impacts remains offsite.

☒ Were background samples collected as part of this site investigation?

One background sample was collected to the south of the unregistered pit. The sample was analyzed for EC, SAR, and pH.

☐ 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 a release was discovered during removal of flowlines, additional excavations were conducted, and impacted soil was removed and transported to a disposal facility. The approximate amount of soil disposed of was 6836 cubic yards, and the disposal location was the North Weld Landfill in Ault, Colorado. Transport and disposal records will be kept on file under usual and customary practice and are available upon request. Soil samples were collected and analyzed for organic constituents (TPH and BTEX) until the areal and vertical extents of the excavation were within COGCC Table 901-1 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.

As needed, site specific soil and/or groundwater remediation plans will be developed and submitted to COGCC via supplemental Form 27s.

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) 6836
_____ 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.

REMEDATION 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: _____

REMEDATION COMPLETION REPORT

REMEDATION 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? 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. During the planning phase of final reclamation projects, the surface of the location is evaluated for physical conditions which may affect earthwork and revegetation efforts, including gravel removal, macronutrient conditions, elevated inorganic constituents (pH, EC, SAR), and other potentially adverse conditions for reclamation. Depending on the results of the evaluation, material may be imported or amended to achieve seedbed conditions consistent with COGCC rules and the landowner approved reclamation plan and seed mix. All reclaimed Extraction surfaces are inspected on a regular schedule to identify potential issues with topsoil conservation and/or vegetation composition, and generate corrective actions so that bond release is achieved as early as possible following final reclamation efforts.

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). 08/27/2018

Date of commencement of Site Investigation. 08/30/2018

Date of completion of Site Investigation. 01/25/2019

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

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 the partially-buried produced-water vessel and remediation associated with various pipelines and the unregistered pit at this location. Although soils surrounding the unregistered pit remain in exceedance for EC and SAR, we recommend leaving them in place to avoid further disturbance to the established vegetation in the area. These constituents are concern for revegetation of the remaining disturbed area, however, during the planning phase of final reclamation projects, the surface of the location is evaluated for physical conditions which may affect earthwork and revegetation efforts, including gravel removal, macronutrient conditions, elevated inorganic constituents (pH, EC, SAR), and other potentially adverse conditions for reclamation. Depending on the results of the evaluation, material may be imported or amended to achieve seedbed conditions consistent with COGCC rules and the landowner approved reclamation plan and seed mix. All reclaimed Extraction surfaces are inspected on a regular schedule to identify potential issues with topsoil conservation and/or vegetation composition. Furthermore, the background sample (BG01@2') taken from downgradient of the remedial investigation area, and characterization samples collected from upgradient (N04@5') and cross-gradient (E04@5', W04@5'), indicate that high EC concentrations are present in the existing soil conditions and are not necessarily related to a release of hydrocarbons. Please find attached a work completion report for a description of site investigation activities and findings, including lab results and photo of the vegetated berms.

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: ` 06/05/2019

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: RICK ALLISON

Date: 07/01/2019

Remediation Project Number: 11742

COA Type**Description**

	<p>COGCC removed the closure request. Operator is directed to address the following 4 items in a Form 27 Supplemental Report. COGCC will consider the closure request and consider changing the pit status to closed in COGIS at that time.</p> <p>1. The laboratory analytical report that includes soil samples collected on September 17, 2018 (N01@2.5' through W01@2.5') was not included. It looks like these samples were placed on hold on a chain-of-custody included with the September 18, 2018 laboratory report from Summit Scientific (Pages 29-44 of attachment 402065962) It appears a portion of this lab report was included twice (pages 110-121 of attachment 402065962). There is data for samples N01@2.5', S01@2.5', N02@2.5', S03@2.5', N04@2.5', S04@2.5', E01@2.5', W01@2.5' presented on the tables. However no data for these hold samples is included in the lab report.</p> <p>2. Site Diagram 2 of the revised report does not include the sample location GB-base02@1', which is included on the tables.</p> <p>3. No lab report for sample GB-base02@1' was included in the attachments.</p> <p>4. The pit has not been backfilled and a depression remains on the location. The pit must be backfilled and the site must comply with Rule 1004 for final reclamation. If the Operator plans to leave the pit in place a variance request must be submitted.</p>
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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**

401929351	FORM 27-SUPPLEMENTAL-SUBMITTED
402065960	SITE INVESTIGATION REPORT
402065962	OTHER

Total Attach: 3 Files

General Comments**User Group****Comment****Comment Date**

Environmental	return to draft for Operator revisions	04/04/2019
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Total: 1 comment(s)