

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 INFORMATON

Name of Operator: <u>EXTRACTION OIL &amp; GAS INC</u>	Operator No: <u>10459</u>	<b>Phone Numbers</b>
Address: <u>370 17TH STREET SUITE 5300</u>		Phone: <u>(720) 481-2362</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80202</u>		Mobile: <u>( )</u>
Contact Person: <u>Blake Ford</u>	Email: <u>bford@extractionOG.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 11742 Initial 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 Facilites ( in accordance with Rule 909.c. )

Facility Type: <u>LOCATION</u>	Facility ID: <u>318027</u>	API #: _____	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 SM Most Sensitive Adjacent Land Use Cropland

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? Yes

**Other Potential Receptors within 1/4 mile**

Residential area, Windsor Reservoir

# 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 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 type="checkbox"/> 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.

# 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? 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. Due to the high-water level of the lake intruding into the area during initial reclamation this year, the pit depression has not been backfilled to date. Once site conditions allow, within the 2019 calendar year, the depression inside of the berm area will be backfilled and graded up to the vegetated surface of the berms in accordance with Rule 1004 for final reclamation. The backfilled area will be graded and mounded so that stormwater will run off properly. The exceedances of SAR in soils may cause depleted crop yields, however, future land use of this site will not be agricultural due to its proximity to Windsor Reservoir, and the seed mix selected will consist of salt tolerant species.

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 in the berms surrounding the unregistered pit remain in exceedance of Table 910-1 for EC and SAR, it is recommended that they are left in place to avoid further disturbance to the established vegetation in the area (see Unregistered Pit Photolog). During the planning phase of final reclamation, the surface of the location was evaluated for physical conditions which may affect revegetation efforts. Due to the high-water level of the lake intruding into the area during initial reclamation this year, the pit depression has not been backfilled to date. Once site conditions allow, within the 2019 calendar year, the depression inside of the berm area will be backfilled and graded up to the vegetated surface of the berms in accordance with Rule 1004 for final reclamation. The backfilled area will be graded and mounded so that stormwater will run off properly. The elevated EC and SAR levels, and other potentially adverse conditions for reclamation are also taken into consideration. Depending on the results of the surface soil evaluation, material may be imported or amended to achieve seedbed conditions consistent with COGCC rules and the landowner approved reclamation plan and seed mix. 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@4', W03@5'), indicate that elevated EC concentrations are naturally occurring in this geology along the shore of the Windsor Reservoir. The exceedances of SAR in soils may cause depleted crop yields, however, future land use of this site will not be agricultural due to its proximity to Windsor Reservoir, and the seed mix selected will consist of salt tolerant species. The land is owned by the Eaton Ditch Company, which plans to use the area as green space, and simply maintain the access road for use by the Windsor Shores RV and trailer camp community. The water level of the Windsor Reservoir seasonally encroaches the outer edges of the unregistered pit berms (see Photolog) and access road. Leaving these longstanding berms and backfilled pit in place provides a stable subsurface for the wetland vegetation that is prominent here to thrive and also protects the Windsor Shores community access road from erosion from the lake waters. 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: 08/01/2019

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: 08/22/2019

Remediation Project Number: 11742

**COA Type****Description**

	This submittal clarifies the Operator's intent to backfill the pit once site conditions allow access addressing condition of approval 3\$ listed on approved Supplemental Form 27 401929351. However, the Remediation Project will remain unresolved until backfill of the pit is complete and final reclamation has commenced. Operator is directed to submit a Form 27 Supplemental Report to request closure once backfill of the pit is complete and final reclamation has commenced. The Remediation Project will be resolved and the pit status changed to "CL" at that time.
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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**

402128911	FORM 27-SUPPLEMENTAL-SUBMITTED
402129007	PHOTOS
402129019	ANALYTICAL RESULTS
402129036	ANALYTICAL RESULTS
402129038	SITE MAP
402129078	MAP
402131688	SITE INVESTIGATION REPORT

Total Attach: 7 Files

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

Environmental	Operator's submittal addresses the conditions of approval 1 through 3 listed on approved Supplemental Form 27 401929351. Operator's attachments included with this Form 27 appear to correct errors or omissions found in attachment 402065962.	08/22/2019
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Total: 1 comment(s)