

State of Colorado
Oil and Gas Conservation Commission

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ROB YOUNG

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: WHITING OIL & GAS CORPORATION	Operator No: 96155	Phone Numbers Phone: (940) 4374113 Mobile: (432) 6616647
Address: 1700 BROADWAY STE 2300		
City: DENVER	State: CO	Zip: 80290
Contact Person: Kyle Waggoner	Email: kyle.waggoner@whiting.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 13769 Initial Form 27 Document #: 402088739

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: SPILL OR RELEASE	Facility ID: 463124	API #: _____	County Name: WELD
Facility Name: Razor 271	Latitude: 40.809367	Longitude: -103.844532	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NESE	Sec: 27	Twp: 10N	Range: 58W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications ML Most Sensitive Adjacent Land Use Rangeland

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

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 type="checkbox"/> Other (as described by EPA) | |

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	~200' x 160'	observation trenches/lab 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.

Available free product was immediately recovered via vacuum truck. The impacted soils on the surface were then removed via hand shoveling, hydovac, and mechanical excavation. The free product had migrated into the pipe chase backfill causing the impacts to go into the subsurface soils. The surface and subsurface equipment (pressure vessels, separators, piping, building, electrical, manifolds, etc.) were then removed to safely mechanically excavate the remaining impacted subsurface soils. The soils located at the pipe chase were mechanically excavated and disposed of at a licensed landfill. The impacts had migrated down to a ~14' below ground surface (BGS) confining layer and spread horizontally through horizontal fractures in the rock above the confining layer. The shallower (<12' BGS) soil horizons away from the former pipe chase do not appear to be impacted by the release. While excavating outwards from the pipe chase the shallower soil horizons were segregated from the 12' -14' BGS impacted soils/rock. Based upon delimitation trenches and the currently excavation activities we estimate that the impacts at the 14' BGS horizon are ~180' x ~140' (see attached map). However, the final excavation limits will be determined by confirmation sampling via laboratory analysis to concentration limits < Table 910-1.

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):

A minimum of 2 grab samples will be collected from each sidewall and 4 bottom hole samples will be collected and submitted for laboratory analysis of TPH and BTEX to confirm that the extents of the impacted soils have been removed to < Table 910-1 Concentrations Levels. The excavated stockpiled overburden soils (< 12' BGS) will be field screened via a calibrated PID every 100 cubic yards and the highest field result per 5 piles (500 cubic yards total) will be sampled (5-part composite) and submitted for laboratory analysis of TPH and BTEX to document that the overburden soils are < Table 910-1 Concentration Levels. In addition, a 5-part composite sample will be collected from the excavated impacted soils every 100 cubic yards and submitted for laboratory analysis of TPH and BTEX to document that any potential residual impacts are <Table 910-1 Concentration Levels.

Proposed Groundwater Sampling

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

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 274
Number of soil samples exceeding 910-1 209
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 12000
0

NA / ND

-- Highest concentration of TPH (mg/kg) 53400
NA Highest concentration of SAR
 BTEX > 910-1 Yes
 Vertical Extent > 910-1 (in feet) 14

Groundwater

Number of groundwater samples collected 0
Was extent of groundwater contaminated delineated? No
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?

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? No _____

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

The surface equipment (LACT, water skid, electrical building, and other equipment) and subsurface piping have been removed for the mechanical excavation of the impacted soils.

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.

The impacted soil located at the source area has been excavated and disposed of at an offsite disposal. The non-impacted overburden soils (<12' BGS) will be excavated and staged onsite and the impacted subsurface soils (~12'-14' BGS) will be excavated and staged separately onsite. Due to the presence of sedimentary rock at the impacted strata the soil remediation options will be evaluated and will likely consist of one or a combination of onsite rock crushing, soil shredding, and chemical oxidation.

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) _____ 600
Name of Licensed Disposal Facility or COGCC Facility ID # _____ 0
Yes _____ Excavate and onsite remediation
No _____ Land Treatment
No _____ Bioremediation (or enhanced bioremediation)
No _____ Chemical oxidation
Yes _____ Other _____ crushing, shredding, and/or chemical oxidation

Groundwater Remediation Summary

No _____ Bioremediation (or enhanced bioremediation)
No _____ Chemical oxidation
No _____ Air sparge / Soil vapor extraction
No _____ 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.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other upon completion of soil remediation

Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other Site Assessment Update

WASTE DISPOSAL INFORMATION

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

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

The treated soil will be sampled and utilized to backfill the excavation

Volume of E&P Waste (solid) in cubic yards 6000

E&P waste (solid) description hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable: 0

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels 20

E&P waste (liquid) description recovered crude oil

COGCC Disposal Facility ID #, if applicable: 440165

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? _____

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? _____

Does Groundwater meet Table 910-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

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.

The treated soils and overburden soils will be incorporated into the subsoil cut slope at a depth >3' BGS once the Table 910-1 thresholds are met to further downsize the pad for interim reclamation. Compaction will be reached via heavy equipment, recontouring to the surrounding surface, reseeded, crimped, and weeds will be chemically controlled (if necessary). The straw mulch will be applied at a rate of 1.5-2 tons per acre and the seed mix consists of: buffalo grass, western wheatgrass, sideoats grama, green needle, rocky mountain beeplant, blue grama, and prairie coneflower and will be applied via disk seeder at a rate of 50lbs/1.455 acre. Vegetation density will be compared to vegetation that is outside the disturbed area until cover has been established at 80% predisturbance levels.

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. 03/06/2019

Actual Spill or Release date, if known. 03/06/2019

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/29/2019

Date of commencement of Site Investigation. 04/29/2019

Date of completion of Site Investigation. _____

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 supplemental report is intended as an update of the remediation activities conducted regarding remediation projects 13769 and 11043. The attached site map depicts the final confirmation samples taken at the current excavation limits. Based upon these confirmation samples being < Table 910-1 we intend on backfilling the excavation.

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

Signed: Kyle Waggoner

Title: Field Regulatory Manager

Submit Date: 11/09/2019

Email: kyle.waggoner@whiting.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: ROB YOUNG

Date: 11/27/2019

Remediation Project Number: 13769

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

<u>Att Doc Num</u>	<u>Name</u>
402235097	FORM 27-SUPPLEMENTAL-SUBMITTED
402235098	SITE MAP
402235099	ANALYTICAL RESULTS

Total Attach: 3 Files

General Comments

User Group

Comment

Comment Date

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	COGCC agrees that backfilling the excavation is appropriate at this time.	11/27/2019

Total: 1 comment(s)