FORM 27 Rev 3/16

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: SRC ENERGY INC Operator No: 10311
Address: 1675 BROADWAY SUITE 2600
City: DENVER State: CO Zip: 80202
Contact Person: Dave Castro Email: dcastro@srcenergy.com

Phone Numbers
Phone: (970) 4755220
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 10672 Initial Form 27 Document #: 401452818

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
- [x] 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
- [ ] Other

SITE INFORMATION

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

Facility Type: SPILL OR RELEASE Facility ID: 451116 API #: County Name: WELD
Facility Name: Eldridge 4-23 Latitude: 40.475524 Longitude: -104.736213
** correct Lat/Long if needed: Latitude: 40.475525 Longitude: -104.736236
QtrQtr: SENE Sec: 23 Twp: 6N Range: 66W Meridian: 6 Sensitive Area? No

SITE CONDITIONS

General soil type - USCS Classifications SC
Most Sensitive Adjacent Land Use agriculture
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

Seeley Lake, various

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
Yes	GROUNDWATER	190' x 80'	groundwater sampling
Yes	SOILS	130' x 130'	soil sampling

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

Historical release found from removal of concrete water vault. Upon removal water vault, excavation activities were started to remove impacted soils near release point. Groundwater amendment was applied to the excavation prior to backfilling activities. Based on excavation and soil/groundwater samples collected it was determined that further site delineation was needed.

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):

During excavation activities in June 2017, MW installation and soil boring sampling June 2017 - April 2018, further excavation in September 2018, and more MW installation activity in October - November 2018, a total of 66 soil samples have been collected. The samples were analyzed for BTEX, TPH-GRO, and TPH-DRO.

Proposed Groundwater Sampling

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

Groundwater impacts are defined at the site. Currently 26 monitoring wells (MW-1 through MW-26) exist onsite. Monitoring wells MW-1 through MW-26 will be sampled on a quarterly basis. The groundwater samples will be 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

		NA / ND	
Number of soil samples collected	66	--	Highest concentration of TPH (mg/kg) 11293.7
Number of soil samples exceeeding 910-1	17	--	Highest concentration of SAR 2.04
Was the areal and vertical extent of soil contamination delineated?	Yes		BTEX > 910-1 Yes
Approximate areal extent (square feet)	7650		Vertical Extent > 910-1 (in feet) 10

Groundwater

		NA / ND	
Number of groundwater samples collected	85	--	Highest concentration of Benzene (µg/l) 37200
Was extent of groundwater contaminated delineated?	Yes	--	Highest concentration of Toluene (µg/l) 15400
Depth to groundwater (below ground surface, in feet)	10`	--	Highest concentration of Ethylbenzene (µg/l) 17000
Number of groundwater monitoring wells installed	26	--	Highest concentration of Xylene (µg/l) 46400
Number of groundwater samples exceeding 910-1	32	NA	Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected

0 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?

Groundwater impacts offsite, to the southwest of the pad, have been defined. MW-18 is the only offsite monitoring well with groundwater impacts exceeding 910-1.

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

Soil sample SS-01 was analyzed for inorganics (EC, SAR, pH).

☒ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards) 1800 Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

quarterly sampling of groundwater for BTEX.

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.

Initial source removal was completed via excavation in June 2017. Additional 1800 cubic yards of impacted soil were excavated to finish source removal activities in September 2018, and more carbon and grypsum amendment placed in the excavation before backfill in the SW corner of the site where the trench was opened up for amendment placement.

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.

Following additional source removal activities via excavation (remediation of remaining impacted soil), a proposed mobile air sparge/soil vapor extraction (AS/SVE) remedial will be installed onsite (remediatoin of impacted groundwater onsite). See attached AS/SVE proposed design letter from Eagle Environmental

Soil Remediation Summary

☒ **In Situ**

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

☒ **Ex Situ**

- Yes Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) 1800
  - 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)
- Yes Chemical oxidation
- Yes 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.

Quarterly sampling of MW-1 thorugh MW-26 (26 wells) analyzed for BTEX. As groundwater impacts decrease monitoring wells may be removed from the sampling plan as long as point of compliance is maintained.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: [X] Quarterly [ ] Semi-Annually [ ] Annually [ ] Other

Report Type: [X] Groundwater Monitoring [ ] Land Treatment Progress Report [X] O&M Report

[ ] Other

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:

impacted soil

Volume of E&P Waste (solid) in cubic yards 1800

E&P waste (solid) description hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: North Weld Landfill

Volume of E&P Waste (liquid) in barrels 0

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? Yes

Does Groundwater meet Table 910-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

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 will follow COGCC guidelines and regulations.

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. 06/14/2017

Actual Spill or Release date, if known. 06/14/2017

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/14/2017

Date of commencement of Site Investigation. 06/14/2017

Date of completion of Site Investigation. 03/01/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 06/14/2017

Date of completion of Remediation.

SITE RECLAMATION DATES

Date of commencement of Reclamation.

Date of completion of Reclamation.

OPERATOR COMMENT

In September of 2018, the residential development installed a permanent buried French Drain and surface discharge outfall system just off the northern edge of this remediation project's site. That drain significantly changed site conditions underneath the project site, causing an increased depth to groundwater, flow direction to change slightly, and impacted groundwater concentrations to decrease. SRC and Eagle Environmental had to basically start from scratch to delineate the new soil and groundwater impacts, excavate and remove more contaminated soil, and install new monitoring wells. This has all been completed and the site is once again fully delineated under current conditions. The purpose of this SF27 is to update COGCC on all the new site investigation and impacted soil removal that has been done since the end of August 2018. Also to propose a new AS/SVE system for approval, to move forward with groundwater and saturated soil remediation. All new figures, tables, lab analytical reports, and new AS/SVE system proposal are attached with this document.

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

Signed:` Dave Castro Title: Sr. Env. Specialist

Submit Date:` 12/11/2018 Email: dcastro@srcenergy.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: 12/21/2018

Remediation Project Number: 10672

COA Type	Description
	Approval from COGCC is required prior to removing monitoring wells from the monitoring program.
	Submit boring logs for replacement monitoring wells and SVE/AS wells with the next Quarter Progress Report.
	On the next Form 27 Supplemental Report, update Remedial Action Dates with date of SVE/AS system startup.
	Confirmation soil samples will be required in areas with remaining impacts to soil above the Table 901- Concentration Levels to demonstrate remediation has achieved compilance with Table 910-1 prior to requesting No Further Action.
	Submit Quarterly Remediation and Groundwater Monitoring Reports for this project.

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
401869273	FORM 27-SUPPLEMENTAL-SUBMITTED
401869483	REMEDIAL ACTION PLAN
401869492	ANALYTICAL RESULTS
401869498	SITE MAP
401869503	SOIL SAMPLE LOCATION MAP
401869506	SOIL SAMPLE LOCATION MAP
401869514	SOIL SAMPLE LOCATION MAP
401869516	GROUND WATER SAMPLE LOCATION
401869518	GROUND WATER ELEVATION MAP
401869519	ANALYTICAL RESULTS
401869521	ANALYTICAL RESULTS
401869522	ANALYTICAL RESULTS
401869524	ANALYTICAL RESULTS
401869527	ANALYTICAL RESULTS

Total Attach: 14 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)