FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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Report taken by: KRIS NEIDEL

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: SANDRIDGE EXPLORATION & PRODUCTION LLC Operator No: 10598

Phone Numbers

Address: 123 ROBERT S KERR AVE Phone: (303) 994-0000

City: OKLAHOMA CITY State: OK Zip: 73102 Mobile: ( )

Contact Person: Dave Boyer Email: dboyer@sandridgeenergy.com

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 13743 Initial Form 27 Document #: 402073369

PURPOSE INFORMATION

- [ ] 901.e. Sensitive Area Determination
- [ ] 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
- [ ] Other

SITE INFORMATION

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

Facility Type: SPILL OR RELEASE Facility ID: 324757 API #: County Name: JACKSON

Facility Name: Mutual Pad 01-17H Latitude: 40.584359 Longitude: -106.404626

** correct Lat/Long if needed: Latitude: Longitude:

QtrQtr: NWNW Sec: 17 Twp: 7N Range: 80W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications: SM Most Sensitive Adjacent Land Use: Hay Meadow

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

The Mutual Ditch is located adjacent to the west edge of the pad and is currently in use. The irrigation ditch is approximately 60 feet west of the spill, outside the well pad containment berm. Grizzly Creek is approximately 2,300 feet east of the spill location.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [x] **E&P Waste**
  - [ ] 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)
- [x] **Non-E&P Waste**

  Contaminated groundwater

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
UNDETERMINED	GROUNDWATER	Approximately 48 inches bgs	Hand auger to depth and step out delineation
Yes	SOILS	Approximately 200 square feet	Hand auger and step out delineation

INITIAL ACTION SUMMARY

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

A Form 27 Supplemental Report 402093377 closure requests was submitted on 10/11/2019. A summary of investigation and remediation actions performed is included in Attachment C of Form 27 Supplemental Report 402285583. The COGCC has requested further action of quarterly sampling of groundwater. In response, SandRidge has installed monitoring wells at the location for quarterly monitoring.

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):

Soil samples were collected from each boring location during the installation of monitoring wells. Grab samples were collected in 2 foot intervals (or less) and screened with a PID for VOC concentrations. Depending upon VOC detection and potential concentration a soil sample may be collected and submitted to the laboratory and analyzed for BTEX and TPH (DRO & GRO).

Proposed Groundwater Sampling

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

A total of five 4 groundwater monitoring wells were installed as part of the site investigation plan. Groundwater samples were collected from each monitoring well following installation and sampled for BTEX, TPH (DRO&GRO), pH, and specific conductivity. Groundwater samples will be collected from monitoring wells on a quarterly basis for at least four (4) consecutive quarters.

Proposed Surface Water Sampling

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

One (1) downstream surface water sample will be collected from the Mutual Ditch (located approximately 60 feet west of the spill area) on a quarterly basis when water is flowing, likely to occur in 2Q2020 and 3Q2020. Surface water will be analyzed for BTEX, TPH (DRO & GRO).

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: 0

Number of soil samples exceeeding 910-1: 0

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

Approximate areal extent (square feet): 0

NA / ND

-- Highest concentration of TPH (mg/kg): 0

-- Highest concentration of SAR: 0

BTEX > 910-1: No

Vertical Extent > 910-1 (in feet): 0

Groundwater

Number of groundwater samples collected: 4

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet): 10`

Number of groundwater monitoring wells installed: 4

Number of groundwater samples exceeding 910-1: 1

-- Highest concentration of Benzene (µg/l): 0

ND Highest concentration of Toluene (µg/l):

-- Highest concentration of Ethylbenzene (µg/l): 2.8

ND Highest concentration of Xylene (µg/l):

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?

☐ 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): 1

Volume of liquid waste (barrels): 0

☒ Is further site investigation required?

Groundwater monitoring wells will be sampled on a quarterly basis in 2020. If analytical results indicate groundwater constituents are below COGCC Table 910-1 acceptable concentrations for all 2020 quarterly samples then the wells will be plugged and abandoned per State of Colorado requirements and upon COGCC approval. If groundwater impacts are consistently observed, a remedial action plan will be developed and submitted to the COGCC.

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.

SandRidge removed impacted material via dig and haul operations. During remedial excavation the failed flowline causing spilled oil was pressure tested, flushed and removed to the extent of the excavation eastern wall where no impacted soil remained and the flowline was capped. Work was completed by Session & Sons, LLC on June 24, 2019. All impacted soil waste was hauled via truck to Twin Enviro Landfill for disposal, located in Milner, Colorado. Water removed from the excavation was collected in frac tanks and hauled to NGL Water Solutions for disposal, located in Greely, Colorado. Manifests are provided in Attachment O and P of Form 27 Supplemental Report 402093377.

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.

All post-remediation groundwater and soil sample results collected from the excavation were below Table 910-1 acceptable concentrations for organic constituents. Groundwater samples collected outside and surrounding the excavation were also below Table 910-1 acceptable concentrations for organic constituents. The COGCC has requested further groundwater monitoring as a COA for Form 27 Supplement Report 402093377. Installation of monitoring wells were installed 2/27/2020 and will be monitored quarterly during 2020.

Soil Remediation Summary

In Situ

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

Ex Situ

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

- 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.

Monitoring wells within the spill location (MW-2, MW-3 and MW-4) and upgradient from the spill (MW-1) have been monitored for the past 4 quarters of 2020. MW-2, MW-4 remain consistent with no detections for contaminants of concern. MW-3 has had detections of benzene, ethylbenzene and xylenes with benzene concentrations above Table 910-1 acceptable concentrations in the past. As approved by the COGCC, ORC socks were installed in MW-3 on November 12, 2020 to enhance remediation of groundwater impacts. Benzene concentrations in MW-3 were non-detect (ND) when sampled during the 4Q2020 monitoring event, completed on November 23, 2020. SandRidge will continue monitoring natural attenuation parameters on a monthly basis.

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? No

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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

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? 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.

The facility is presently in use and reclamation activities are not warranted at this time onsite.

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. 06/11/2019

Actual Spill or Release date, if known.

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/11/2019

Date of commencement of Site Investigation. 06/11/2019

Date of completion of Site Investigation.

REMEDIAL ACTION DATES

Date of commencement of Remediation. 06/17/2019

Date of completion of Remediation. 06/26/2019

SITE RECLAMATION DATES

Date of commencement of Reclamation.

Date of completion of Reclamation.

OPERATOR COMMENT

A narrative is provided describing fourth quarter monitoring for 2020 and continued monitoring throughout 2021 (Attachment A). This Form 27 Supplemental was returned to draft on 1/12/2021 in request for additional information. The request has been addressed by providing updated attachments of the monitoring report and analytical summary.

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

Signed:` Joel Mason Title: Senior Project Manager

Submit Date:` 01/14/2021 Email: joel.mason@absarokasolutions.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: KRIS NEIDEL Date: 01/28/2021

Remediation Project Number: 13743

COA Type	Description
	Continue with quarterly monitoring and reporting.
	Concentrations of Inorganics in groundwater shall be determined by local conditions at the time of sampling.
	In the next quarterly report include a comparison of Monitoring Well sample results to that of nearby water well baseline samples.

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
402548031	FORM 27-SUPPLEMENTAL-SUBMITTED
402555734	MONITORING REPORT
402555736	MAP
402555737	SITE MAP
402555738	GROUND WATER ELEVATION MAP
402555739	GROUND WATER SAMPLE LOCATION
402555747	ANALYTICAL RESULTS
402555749	OTHER
402555751	OTHER
402575010	MONITORING REPORT
402575011	ANALYTICAL RESULTS

Total Attach: 11 Files

General Comments

User Group	Comment	Comment Date
Environmental	Are any methods being used to determine effectiveness of ORC "sock"?	01/26/2021

Total: 1 comment(s)