

State of Colorado Oil and Gas Conservation Commission

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401670688

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06/12/2018

Report taken by:

Jim Hughes

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: LINDE INC	Operator No: 1375	Phone Numbers
Address: 200 SOMERSET CORP BLVD #7000		Phone: (303) 5909145
City: BRIDGEWATER	State: NJ Zip: 07083	Mobile: (443) 8043596
Contact Person: Ned Lundvall	Email: elundvall@eaest.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 11138

Initial Form 27 Document #: 401583164

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 Facilities (in accordance with Rule 909.c.)

Facility Type: PIT	Facility ID: 112977	API #: _____	County Name: MONTEZUMA
Facility Name: SCHMIDT 2		Latitude: 37.364865	Longitude: -108.787596
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: SWNW	Sec: 24	Twp: 36N	Range: 18W Meridian: N Sensitive Area? No

SITE CONDITIONS

General soil type - USCS Classifications ML

Most Sensitive Adjacent Land Use BLM National Monument

Is domestic water well within 1/4 mile? No

Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

Ephemeral drainages

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
UNDETERMINED	SOILS	Vicinity of pit	Laboratory samples analyzed for 910-1

INITIAL ACTION SUMMARY

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

Remaining water was pumped from the pit. Delineation began on surface soils and then of subsurface soils using field screening methods.

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):

18 soil samples will be collected from hollow stem auger cuttings. Samples will be composited across two foot intervals. Boreholes are displayed on Figure 1 of the attached work plan. Sample intervals are identified by Borehole ID in Table 1 of the work plan. (update 6/12/18 - completed, described attachments are on initial form 27)

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):

Boreholes will be logged to determine the feasibility of bioventing. Bioventing wells will be installed in 4 select boreholes in preparation for a bioventing test. (update 6/12/18 - completed)

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 18

Number of soil samples exceeding 910-1 18

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 0

NA / ND

-- Highest concentration of TPH (mg/kg) 120.3
9

-- Highest concentration of SAR 47

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 55

Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 450'

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 910-1 0

NA 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

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?

One shallow soil sample was collected from an undisturbed area away from impacted soil using a hand auger. It was collected in an area and at a depth that was not expected to have impacts from ongoing site activities. The sample had 910-1 exceedances of boron and arsenic.

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

Volume of solid waste (cubic yards) 2

Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

Arsenic was detected in sandstone at 50-55 feet below grade (52 mg/kg). It is recommended that the leaching potential of arsenic to groundwater at depth be evaluated using conservative parameters and low distribution coefficient. Given that the depth to regional groundwater is over 400 feet, and because the Wanakah Formation contains low permeability mudstone sequences, it is unlikely the arsenic will leach to groundwater. EA proposes to submit a work plan on behalf of Linde LLC to conduct this analysis, and if it can be shown that leaching of arsenic to depth is not a concern, then no exposure pathway exists, and remediation can be considered complete in accordance with Section 909.e.1 of the COGCC 900 Series Rules.

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.

With soil impacts limited to SAR, EC, pH, arsenic and boron similar to background, source removal is not anticipated.

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.

Next steps will involve assessing the leaching potential of arsenic in bedrock. A remedial action plan, or other next step, will be determined following the conclusion of that assessment and discussions with COGCC.

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

- ☐ _____ 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? Yes _____

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.

This investigation will help guide decisions on remediation methods. The soil around the pit will need to be excavated and the remaining soil is being investigated for bioventing feasibility. Once remediation is complete, reclamation will be evaluated.

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. _____

Actual Spill or Release date, if known. 10/30/2017

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/30/2017

Date of commencement of Site Investigation. 04/11/2018

Date of completion of Site Investigation. 04/13/2018

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

Depth to groundwater is estimated (as explained in the attached report).
The attached site investigation report includes tables, figures, bore logs, laboratory report, and discussion of data.
After you have had a chance to review, we would like to setup a meeting to discuss an appropriate path towards remediation completion.
Please feel free to contact me during your review if you have any questions.

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

Signed: Ned Lundvall

Title: Project Manager

Submit Date: 06/12/2018

Email: elundvall@eaest.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: Jim Hughes

Date: 06/20/2018

Remediation Project Number: 11138

COA Type

Description

	Investigative report attached to the Supplemental Form 27 indicate exceedances of Table 910-1. Approval of this document is solely for data review purposes and is not intended as acceptance of any proposed work plans.
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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

401670688	FORM 27-SUPPLEMENTAL-SUBMITTED
401670808	SITE INVESTIGATION REPORT

Total Attach: 2 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)