FORM 27 Rev 5/22

State of Colorado
Energy & Carbon Management Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109

Document Number: 404161948
Receive Date: 04/11/2025
Report taken by: Krystal Heibel

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 ECMC 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.
Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATON

Name of Operator: MAGPIE OPERATING INC Operator No: 52530
Address: 2707 SOUTH COUNTY RD 11
City: LOVELAND State: CO Zip: 80537
Contact Person: Ross Warner Email: ross.magpieoil@gmail.com

Phone Numbers
Phone: (970) 669-6308
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 13484 Initial Form 27 Document #: 402026653

PURPOSE INFORMATION

- [ ] Rule 913.c.(1): Pit or Cuttings Trench closure.
- [X] Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- [X] Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- [ ] Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- [ ] Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- [ ] Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- [ ] Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- [ ] Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- [X] Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- [ ] Rule 913.g: Changes of Operator.
- [X] Rule 915.b: Request to leave elevated inorganics in situ.
- [ ] Other:

SITE INFORMATION

Yes Multiple Facilities

Facility Type: PIT Facility ID: 111980 API #: County Name: LOGAN
Facility Name: WARNECKE LEASE Latitude: 40.624978 Longitude: -103.334998
** correct Lat/Long if needed: Latitude: 40.625044 Longitude: -103.335102
QtrQtr: SESE Sec: 30 Twp: 8N Range: 53W Meridian: 6 Sensitive Area? No

Facility Type: LOCATION Facility ID: 312143 API #: County Name: LOGAN
Facility Name: WARNECKE-68N53W 30SESE Latitude: 40.625638 Longitude: -103.337188
** correct Lat/Long if needed: Latitude: 40.625285 Longitude: -103.335214
QtrQtr: SESE Sec: 30 Twp: 8N Range: 53W Meridian: 6 Sensitive Area? No

SITE CONDITIONS

General soil type - USCS Classifications CL

Most Sensitive Adjacent Land Use Crop land

Is domestic water well within 1/4 mile? Yes

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

Domestic Well - Permit #36326 - 1300' SSW

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	SOILS	To be determined	Soil sampling and laboratory 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.

On 8/30/23 Jody Kost of Magpie met with the landowner to discuss next steps of surface excavation and sampling to address inorganic soils that still remain. On 9/13/23 Sunstate Equipment delivered an excavator to the location. On 9/14/23 a track was thrown from the excavator and Sunstate sent out maintenance to repair. On 9/15/23 Washington County Landfill was closed half day, work ceased at noon. On 9/18/23 Jody Kost had a phone conversation with Krystal Heibel of ECMC to discuss remediation report and status of ongoing remedial activities. On 9/19/23 a front loader was delivered to location to assist with loading trucks to haul the removed top 3' of inorganic impacted soil from the area of the former pit to Washington County Landfill. Manifests can be found in document number 403625692 that was submitted with approved SF27 document number 403612100. Approximately 2,800 cubic yards of material was removed. From 10/4/23 to 10/6/23, further horizontal and vertical delineation took place using a hand auger. Results show further horizontal and vertical delineation of Table 915-1 Soil Suitability for Reclamation impacts is needed in certain areas. See below proposed sampling plan and Figure 5 in the attached site investigation report for proposed additional delineation. On 11/9/23, the site was visited to sample the pit bottom (Pit-SS@4'), a landowner manure stockpile (Manure) and a dirt stockpile (Stockpile). The samples were submitted to Origins for full Table 915-1 analysis, however the Manure sample did not have Table 915-1 Metals run. Results confirmed no organics impacts in any of the 3 samples. See attached site investigation report for all figures, tables, photo log, boring logs, manifests, and laboratory analytical reports.

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 will be collected as needed to complete vertical and horizontal delineation. Background samples may be collected to characterize native levels of inorganic constituents at the Location. See the attached Report of Work Completed (ROWC) for additional details. Soil samples will be submitted for Full ECMC Table 915-1 analysis.

Proposed Groundwater Sampling

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

Groundwater has not been encountered at any point during investigation activities to date. Magpie will attempt to collect a sample for characterization if groundwater is encountered during site investigation activities.

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: 198
Number of soil samples exceeeding 915-1: 140
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet): 28000

NA / ND

-- Highest concentration of TPH (mg/kg): 29.46
-- Highest concentration of SAR: 215
BTEX > 915-1: No
Vertical Extent > 915-1 (in feet): 20

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 915-1:

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 915-1
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?

On 10/11/22, 3 background samples were collected from 0-3' and submitted to Origins for analysis of EC, pH, and SAR. On 1/12/23, an additional 13 background samples were collected from 3', 6', and 10' bgs and submitted to Origins for analysis of ECMC Table 915-1 Soil Suitability for Reclamation and Metals.

☐ 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?

See Proposed Soil Sampling section and the attached ROWC for details.

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.

Well is plugged and abandoned, equipment has been removed, pit has been been excavated to approximately 3' bgs. Magpie is in the process of determining the extent of impacts associated with the project. Once the extent is determined, Magpie will provide a remediation strategy and/or Reclamation plan for ECMC review and approval on a Supplemental Form 27.

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.

Organic compounds at the Location are present at low concentrations, with only minor exceedances of PGSSL. All values are below RSSL and fully delineated. Arsenic ranges from 2.69 to 5.17 mg/kg, consistent with background conditions and not indicative of oil and gas impacts. Barium is generally consistent with native concentrations, except one elevated result (SB-11 @ 15') which is fully delineated and remains below the 15,000 mg/kg RSSL. Lead exceedances above PGSSL were observed at SB-13 @ 15' (27.8 mg/kg) and SB-24 @ 20' (19.7 mg/kg), both below the 400 mg/kg RSSL. Hexavalent chromium was detected above PGSSL and RSSL. Background samples collected in 2023 did not detect due to higher reporting detection limits (>0.5 mg/kg). More recent sampling with lower detection limits has consistently identified hexavalent chromium below the former threshold, suggesting trace levels may be naturally occurring.

Hydrogeological assessment indicates groundwater is deeper than 100 feet bgs and is protected by ~155 feet of shale, which serves as a confining layer. No perched groundwater or migration pathway was identified.

SSR constituents (EC, SAR, pH, boron) remain above Table 915-1 thresholds and will require further action. However, based on the ECMC's position during the April 9, 2025, meeting, application of RSSLs will not be considered until delineation is complete. Magpie intends to complete delineation and background sampling to determine final cleanup criteria, which will allow for the appropriate development of remedial design and strategy.

Soil Remediation Summary

[X] In Situ

- ____ Bioremediation (or enhanced bioremediation)
- ____ Chemical oxidation
- ____ Air sparge / Soil vapor extraction
- ____ Natural Attenuation
- Yes Other Gypsum application occured in 2021 as a chemical soil amendment

[X] Ex Situ

- Yes Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) 2800
  - Name of Licensed Disposal Facility or ECMC 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.

Groundwater is not anticipated to be encountered. Magpie will attempt to collect a sample for characterization if groundwater is encountered during site investigation activities.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

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

[ ] **Request Alternative Reporting Schedule:**

[ ] Semi-Annually [ ] Annually [ ] Other

Rule 913.e:
After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

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

[X] Other Q1 2025 REM Status Update

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).
If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Magpie has financial assurance bonding per Rule 702 in excess of $1.2 million and carries General Liability Insurance in the amount of $5,000,000 per occurrence in compliance with Rule 705. No claim is anticipated for this cleanup effort. Magpie has its own roustabout crew, heavy machinery, and hauling trucks in-house to eliminate vendor costs. Project is 75% complete.

Operator anticipates the remaining cost for this project to be: $ 25000

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:

none

Volume of E&P Waste (solid) in cubic yards 2800

E&P waste (solid) description Inorganic impacted soil

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility: Washington County Landfill, Pawnee Waste

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

E&P waste (liquid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

If YES:

[ ] Compliant with Rule 913.h.(1).

[ ] Compliant with Rule 913.h.(2).

[ ] Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards? No

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards? Yes

Is additional groundwater monitoring to be conducted?

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

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 be in accordance with 1000 series rules and in coordination with the Surface Owner land use plans. In July and August 2024, Magpie completed final reclamation of the wellhead and access road at the request of the landowner.

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 provide the seed mix? No

If YES, does the seed mix comply with local soil conservation district recommendations?

Did the local soil conservation district provide the seed mix? No

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 10/01/2025

Proposed date of completion of Reclamation. 12/31/2025

IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 04/08/2019

Actual Spill or Release date, or date of discovery. 07/11/2019

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/13/2019

Proposed site investigation commencement. 06/13/2019

Proposed completion of site investigation. 07/31/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/03/2020

Proposed date of completion of Remediation. 12/31/2025

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

☐ Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

OPERATOR COMMENT

Organic compounds detected at the Location are present at low concentrations, with only minor exceedances of PGSSL. All organic constituent concentrations are below RSSL and are fully delineated. Arsenic concentrations in site samples are consistent with background conditions, ranging from 2.69 to 5.17 mg/kg, and do not suggest impacts as a result of oil and gas activities. Barium concentrations also reflect naturally occurring levels, with the exception of one elevated result at SB-11 @ 15', which is fully delineated and remains below the RSSL threshold of 15,000 mg/kg. Exceedances of lead above PGSSL were detected in two samples (SB-13 @ 15' and SB-24 @ 20') at concentrations of 27.8 mg/kg and 19.7 mg/kg, respectively. Both values are below the allowable RSSL limit of 400 mg/kg. Exceedances of hexavalent chromium were observed above both PGSSL and RSSL thresholds. While background samples collected in 2023 did not detect hexavalent chromium, the laboratory reporting detection limits at that time were not sensitive enough to identify concentrations below 0.5 mg/kg. More recent sampling conducted in 2024, using lower detection limits, consistently identified hexavalent chromium at levels below the previous reporting threshold. This pattern suggests that trace levels of hexavalent chromium may be naturally occurring at the Location.

Hydrogeological assessment determined that groundwater at the Location is deeper than 100 feet bgs and is underlain by an average of 155 feet of shale, which acts as a confining layer. No perched groundwater was identified, and there is no evidence of a viable pathway for communication between impacted soils and underlying groundwater. Based on these findings, Magpie intends to complete vertical and horizontal delineation of hexavalent chromium as well as collecting additional background samples to be analyzed against improved detection limits to accurately compare native concentrations of hexavalent chromium to those observed in the most recent sampling event.

While SSR constituents such as EC, SAR, pH, and boron remain above Table 915-1 SSR thresholds, Magpie acknowledges that further action will be required to address these impacts. However, based on the position communicated by ECMC during the April 9, 2025, meeting, the application of the RSSL will not be considered until delineation is complete. Magpie proposes to complete remaining delineation and background sampling activities as needed to complete horizontal and vertical delineation. This is integral to the project as further remedial design will be dependent on applicable cleanup criteria. Without confirmation of the screening levels that will ultimately be applied, it is not feasible to appropriately scope or implement final corrective actions for SSR constituents.

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

Signed: Amber Barnett Title: Compliance Specialist

Submit Date: 04/11/2025 Email: abarnett@ardorenvironmental.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Krystal Heibel Date: 05/13/2025

Remediation Project Number: 13484

COA Type	Description
	Operator shall email notify ECMC Staff (krystal.heibel@state.co.us & kyle.waggoner@state.co.us) no later than 72 hours before any field work begins.
	Operator shall provide plans of remediation for all analytes that exceed Table 915-1 Protection of Groundwater SSLs no later than 90 days after this form's submittal date (July 10, 2025).
	Operator shall provide a revised Soil Sample Location Map that illustrates the location of 3 soil borings, spaced triangularly, within the former pit area to demonstrate if there is indeed no pathway to groundwater no later than 90 days after this forms submittal date (July 10, 2025). Operator shall provide the proposed soil boring depth(s) and potential sampling intervals. Per Rule 915.a Soil Concentrations - Determination of Pathway to Groundwater guidance document: "As part of reporting a Spill or Release, the Operator will present site specific information and data for Staff to consider in making a determination if a pathway to Groundwater is present.". On the subsequent Form 27 Supplemental Operator shall provide a detailed evaluation of site specific information as outlined in the aforementioned guidance document for ECMC review in determination of whether the Residential SSL or Protection of Groundwater SSLs will be applied to the spill. Operator shall abide by protection of groundwater soil screening levels until such determination can be made.

	Operator shall clearly identify what "series of errors" from aggregated lab data were previously submitted within the next submittal, which will be no later than 90 days after this forms submittal date (July 10, 2025). "When completing a final quality control check on aggregated lab data for certified results, a series of errors were identified in the aggregated data in the lab summary tables generated by Confluence. To avoid submitting incorrect summary tables, they are not included with this report, and will be provided in a supplemental Form 27 after troubleshooting is complete. However, this identified problem does not appear to alter our provided analysis or recommendations for additional analysis. Certified lab reports are provided to support the analysis and recommendations provided here."
	Operator shall provide a plan to delineate vertically and horizontally to establish points of compliance no later than 90 days after this forms submittal date (July 10, 2025). Once delineation is established, ECMC will review the request to use Residential SSLs. ECMC does not approve of Operator's request to use Table 915-1 Residential Soil Screening Levels.
	Hexavalent chromium concentrations in confirmation soil samples exceed the Table 915-1 Protection of Groundwater Soil Screening Level Concentrations and the Table 915-1 Residential Soil Screening Level Concentrations. Operator will provide additional data to characterize these metal concentrations at the site to determine its source in the next quarterly report and provide a remediation plan for these metal exceedances. "Hexavalent chromium was detected above PGSSL and RSSL. Background samples collected in 2023 did not detect due to higher reporting detection limits (>0.5 mg/kg). More recent sampling with lower detection limits has consistently identified hexavalent chromium below the former threshold, suggesting trace levels may be naturally occurring."
	Operator shall attach a revised Soil Sample Location Map that illustrates the soil boring or soil sample locations to complete delineation no later than 90 days after this forms submittal date (July 10, 2025). "Soil samples will be collected as needed to complete vertical and horizontal delineation. Background samples may be collected to characterize native levels of inorganic constituents at the Location. See the attached Report of Work Completed (ROWC) for additional details."
7 COAs	

ATTACHMENT 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
404161948	INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL)
404162413	ANALYTICAL RESULTS
404162414	ANALYTICAL RESULTS
404162415	ANALYTICAL RESULTS
404162416	ANALYTICAL RESULTS
404162417	ANALYTICAL RESULTS
404162418	ANALYTICAL RESULTS
404162419	ANALYTICAL RESULTS
404162420	ANALYTICAL RESULTS
404162421	ANALYTICAL RESULTS
404162422	ANALYTICAL RESULTS
404162423	ANALYTICAL RESULTS
404162424	ANALYTICAL RESULTS
404162425	ANALYTICAL RESULTS
404162436	SITE INVESTIGATION PLAN

404201771	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 16 Files

General Comments

User Group	Comment	Comment Date
Environmental	Multiple soil boring logs document "moist soil" and a water well (Permit No. 35744) is less than a mile away illustrates that depth to water is between 19 and 67 feet. "Hydrogeological assessment determined that groundwater at the Location is deeper than 100 feet bgs and is underlain by an average of 155 feet of shale, which acts as a confining layer. No perched groundwater was identified, and there is no evidence of a viable pathway for communication between impacted soils and underlying groundwater."	05/09/2025

Total: 1 comment(s)