

West Des Moines, IA

PROJECT: Climax,Future Cell Const DATE: 10/16/2025
Services LF,IA
27224513.00

SUBJECT: Climax Molybdenum Company TRANSMITTAL ID: 00009
Phases 4-6 Construction
Documentation Report

PURPOSE: For Record VIA: Info Exchange

FROM

NAME	COMPANY	EMAIL	PHONE
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TO

NAME	COMPANY	EMAIL	PHONE
Becky Jolly		becky.jolly@dnr.iowa.gov	
brian.rath@dnr.iowa.gov		brian.rath@dnr.iowa.gov	

REMARKS: Good afternoon,

Please use the access link below to download the Climax Molybdenum Company Industrial Landfill Phase 4-6 Construction Documentation Report.

If you have any questions about the report, please reach out.

Thank you,

Kasi Province, P.E.
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www.scsengineers.com

DESCRIPTION OF CONTENTS

QTY	DATED	TITLE	NOTES
1	10/16/2025	Climax Molybdenum Company Phases 4-6_Construction Observation Report_56-SDP-06-80P_20251016 (Sealed).pdf	

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Transmittal

DATE: 10/16/2025
TRANSMITTAL ID: 00009

Mandy Lilla	
David Caskey	(Climax Molybdenum Company)
Kevin Jensen	(SCS Engineers)
Morgan Sykes	(SCS Engineers)
Christine Collier	(SCS Engineers)



Construction Documentation Report Phases 4-6 Construction

Climax Molybdenum Company Industrial Landfill
2598 Highway 61
Fort Madison, Iowa 52627

SCS ENGINEERS

27224513.00 | October 2025

1690 All-State Court, Suite 100
West Des Moines, IA 50265
515-631-6160

Title Page and Index

Construction Observation Report – Phases 4-6

Climax Molybdenum Company

Permit Number 56-SDP-06-80P

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1 CERTIFICATION STATEMENT

I hereby certify that the approximately 1 acre of composite liner and leachate collection systems for the Phases 4-6 sanitary disposal area of the Climax Molybdenum Company Industrial Landfill were constructed in accordance with the requirements of Iowa Administrative Code Rule 567-Chapter 115 and the approved plans and specifications. More specifically, the unit was constructed in substantial compliance with the approved Quality Control and Assurance (QC&A) Program (originally submitted April 2012, modified December 2024) and the construction documents provided by SCS Engineers dated December 2024.

 10/16/2025	I hereby certify that this engineering document was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.  Digitally signed by Morgan Sykes PE DN: cn=US, E=morgansykes@scsengineers.com, o=SCS Engineers, ou=BU-27, cn=Morgan Sykes PE, Location: Omaha, NE Reason: I have reviewed this document Content-Info: 402-638-0323 Date: 2025.10.16 14:01:33-05'00' Morgan Sykes PE 10/16/2025 (signature) (date) Printed or typed name: Morgan B. Sykes License Number: 17859 My license renewal date is December 31, 2025 Pages or sheets covered by this seal: Report Sections 1.0– 10.0 and Appendices A - G
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2 PROJECT OVERVIEW

SCS Engineers (SCS) is pleased to present this Construction Observation Report for the construction of the Phases 4-6 sanitary disposal at Climax Molybdenum Company Industrial Landfill located at 2749 Highway 27 Argyle, Iowa. This report provides information and data to comply with 567 Iowa Administrative Code (IAC) Chapter 115 and the approved permit documents for the facility.

2.1 PROJECT SUMMARY

Phases 4-6 were constructed by Steger Construction. The construction documentation drawings for the project are included in Appendix A, titled “Phases 4-6 Construction Drawings,” prepared by SCS Engineers, dated December 2024.

The following QC&A activities were performed by SCS during the construction of Phases 4-6:

- Attended project meetings;
- Collected soil samples from the borrow area and submitted the samples to a geotechnical laboratory for testing;
- Observed subgrade proof rolling activities;
- Reviewed the geosynthetic manufacturer’s quality control submittals for compliance with manufacturer’s specifications;
- Conducted field moisture and density testing during construction of the compacted soil liner using a nuclear density/moisture gauge;
- Observed and documented the high-density polyethylene (HDPE) geomembrane deployment, seaming, and testing (non-destructive and destructive);
- Observed the collection and submission of HDPE geomembrane seam samples to a geosynthetics testing laboratory for seam strength analysis (destructive testing);
- Observed the collection of sand and aggregate samples for laboratory analysis;
- Observed the leachate pipe and cleanouts installation;
- Observed temporary future liner tie-in berm construction;
- Observed the sand drainage layer placement;
- Observed and photographed construction activities. The construction photo log is presented as Appendix G

2.2 PROJECT CONTACT LIST

Owner

Climax Molybdenum Company
2598 Highway 61
Fort Madison, IA 52627
Mr. David Caskey, Manager

Design Engineer

SCS Engineers
1690 All-State Court, Suite 100
West Des Moines, IA 50265
Ms. Christine Collier, PE, Project Manager

Surveyor

Klingner & Associates
610 N. 4th St., Suite 100
Burlington, IA 52601
Mr. Jeff Miller, LS

GCL/Geomembrane/Geotextile Supplier

Clean Air and Water Systems, LLC
1323 Poplar Drive
Waukesha, WI 53188
Mr. Luke Krabel

Geosynthetics Testing Laboratory

TRI – Geosynthetic Services Division
9063 Bee Caves Road
Austin, TX 78733

Contractor

Steger Construction
3297 Vine Road
Dyersville, IA 52040
Mr. Paul Steger, Project Manager

Construction Quality Assurance Engineer

SCS Engineers
1690 All State Court, Suite 100
West Des Moines, IA 50265
Mr. Morgan Sykes, PE, Project Manager
Ms. Lena Sengphachanh, Resident Project Representative
Mr. Semir Omerovic, Resident Project Representative

Geosynthetics Installer

Clean Air and Water Systems, LLC
1323 Poplar Drive
Waukesha, WI 53188
Mr. Luke Krabel

Soil Testing Laboratories

Terracon Consultants
2640 12th Street SW
Cedar Rapids, IA 52404
Mr. Eric Puls

Klingner & Associates
610 N. 4th St., Suite 100
Burlington, IA 52601
Ms. Julie Ciccarelli

3 SUBGRADE CONSTRUCTION

Steger Construction began the preparation and excavation of subgrade in September 2025. The subgrade system for Phases 4-6 was prepared by excavating to the grades depicted in the Construction Drawings. The cell subgrade elevations were achieved by excavating native materials. Prior to the placement of compacted soil liner, the subgrade was proof rolled with a piece of loaded heavy equipment and observed for excessive rutting, pumping, soft spots, and/or sharp protrusions.

Once the design elevation for the top of subgrade was achieved and passing proof-rolling tests were obtained, the subgrade was surveyed to document that actual subgrade elevations were within allowable tolerance of the design. Surveyed elevations for top of subgrade were measured at designated points on a 100-foot grid basis and are included in Appendix B Thickness Verification.

4 COMPACTED SOIL LINER CONSTRUCTION

During construction of the compacted soil liner, SCS collected bulk samples and undisturbed compacted soil liner samples for laboratory testing. Per the requirements of the CQA Plan, one bulk soil liner sample was collected for every 3,000 cubic yards of material placed. Each bulk sample was tested for grain size, Atterberg limits, soil classification, maximum dry density, and optimum moisture content. The Contractor used Shelby tubes to obtain undisturbed samples of the compacted soil liner. Holes created by the Shelby tube samples were backfilled with granular bentonite. A total of 4 in-place, undisturbed samples from the compacted soil liner were collected for laboratory testing.

Results of laboratory testing are contained in Appendix C. Laboratory test results confirm that the mean value of the compacted soil liner material meets the permeability requirements of 1×10^{-7} cm/s per the QC&A program.

The thickness of the compacted soil liner layer was monitored by Steger Construction during placement using a GPS system mounted on the construction equipment. Upon completion of compacted soil liner placement, the top of the compacted soil liner was surveyed by Klingner & Associates on a 100-foot grid using the same survey points used to document the subgrade. The final elevations of the compacted soil liner are shown in Appendix A on Plan Sheets C3.1. Surveyed elevations were compared to the documented subgrade elevations to determine the thickness of the compacted soil liner. Compacted soil liner thickness calculations are summarized in Appendix B. The total compacted soil liner thickness meets the minimum required thickness of 2 feet.

5 GEOSYNTHETICS INSTALLATION (FML)

Prior to deployment of the FML, the surface of the compacted soil liner was inspected by the QC&A Officer's Designee for the presence of rocks and other sharp or protruding objects. Such objects were removed, and depressions or irregular surfaces caused by equipment were re-graded, recompacted, and smooth rolled.

The 60-mil double-sided textured high-density polyethylene (HDPE) geomembrane was installed directly on top of the compacted soil liner in panels as shown in Appendix D. The panels were welded together using double-fusion welded seams, which provided a means to conduct air pressure leak testing of the welds. All seams passed the field testing (see Appendix D4).

Destructive samples were cut from the installed FML at the minimum rate of one sample for each 750 linear feet of double-fusion weld. Tests were performed by Geotechnics Geotechnical & Geosynthetic Testing Group on the double-fusion welds to confirm the strength of the welds. Five (5) samples were cut from the welded seams and tested for peel and shear. All third-party peel and shear test results passed. The test results are provided in Appendix D7.

In areas inaccessible to double-fusion welds, extrusion welds were used. Typically, extrusion welds were used at the intersection of three or more panels, to repair destructive test areas, and where pipe boots were installed. Extrusion welds were tested using the vacuum box method; all extrusion welds passed the testing (see Appendix D8).

The material certification and warranty documents for the rolls of FML used for the project are provided in Appendix D1. The FML was secured along edges where it was not seamed to existing FML using a 24-inch wide by 24-inch deep anchor trench that was excavated in the compacted soil liner. Plywood was placed over the anchor trench along the south and west boundaries to serve as a locator for future tie-in.

6 LEACHATE COLLECTION SYSTEM CONSTRUCTION

6.1 LEACHATE COLLECTION PIPING

Approximately 210 linear feet of 6-inch perforated HDPE SDR 11 leachate collection pipe was installed in as shown in the construction drawings and connected to the existing 6-inch perforated and solid HDPE SDR 11 pipe from the adjacent Phases 2-3. Gravel bedding and backfill were placed six inches above and below the perforated leachate collection pipe.

The cleanouts for Phases 4-6 were installed as shown in Appendix A with 6" solid HDPE SDR 11 piping, as shown on the drawings.

6.2 LEACHATE DRAINAGE AND PROTECTIVE LAYERS

After the installation of the FML, a 12-inch leachate drainage layer of sand was placed directly on top of the FML in the basal area. The gradation and permeability testing results for the sand are provided in Appendix E. Thickness verification for the leachate drainage layer was performed by Klingner & Associates.. The minimum required thickness of 12 inches was verified by surveying the elevation of the sand at the same grid points outlined above and comparing the top of sand elevation to the top of compacted soil liner elevation. The current thickness verification calculations are provided in Appendix B.

7 STORMWATER CONTROLS

A perimeter stormwater ditch was constructed along the south boundaries of the cell. Details and location of the stormwater ditch are in Appendix A.

8 CONSTRUCTION DOCUMENTATION

The QC&A Officer's designee recorded daily construction activities, including summaries of weather conditions, locations at the facility where the construction was occurring, equipment, materials,

personnel utilized in the construction, meetings related to construction activities, and construction progress. Copies of the daily reports are provided in Appendix F.

Photographs were taken showing the general construction progress of the project. All photographs were taken during normal daylight hours. The dates of the photographs are shown in each photo caption. The construction photographs are provided in Appendix G. Construction documentation drawings are provided in Appendix A.

9 GENERAL COMMENTS

The observations and notes presented in this report are based upon data obtained from the field, observations made during construction activities, and other information discussed in this report. SCS has prepared this report for the exclusive use of our client. The report is meant for specific application to the project discussed and has been prepared in accordance with generally accepted environmental and geotechnical engineering practices. No warranties, express or implied, are intended or made.

Climax Molybdenum Company requested the contractor, Steger Construction, perform repairs on an existing leachate line while they were onsite under a separate contract. That information is seen throughout the Daily Field Activities Reports but is not located within the construction boundary of the Phases 4-6 construction project and is not part of the formal documentation.

Geosynthetic panel orientation update was discussed with the Iowa Department of Natural Resources (DNR) on September 26, 2025, and approved the same day.



Appendix A

Construction Documentation Drawings

CLIMAX MOLYBDENUM COMPANY

CLIMAX MOLYBDENUM INDUSTRIAL LANDFILL

PHASE 4-6 CONSTRUCTION

PREPARED FOR
CLIMAX MOLYBDENUM COMPANY
2598 HIGHWAY 61
FORT MADISON, IA 52627

Solid Waste Permit No. 56-SDP-06-80
JANUARY 2025

PREPARED BY

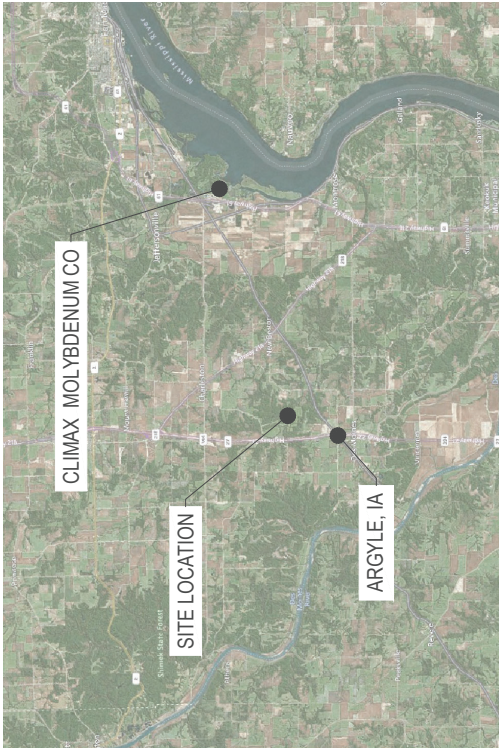
SCS ENGINEERS

1690 ALL STATE COURT, SUITE 100
WEST DES MOINES, IA 50265
PH. (515) 631-6160

PROJECT NO. 27224513.00

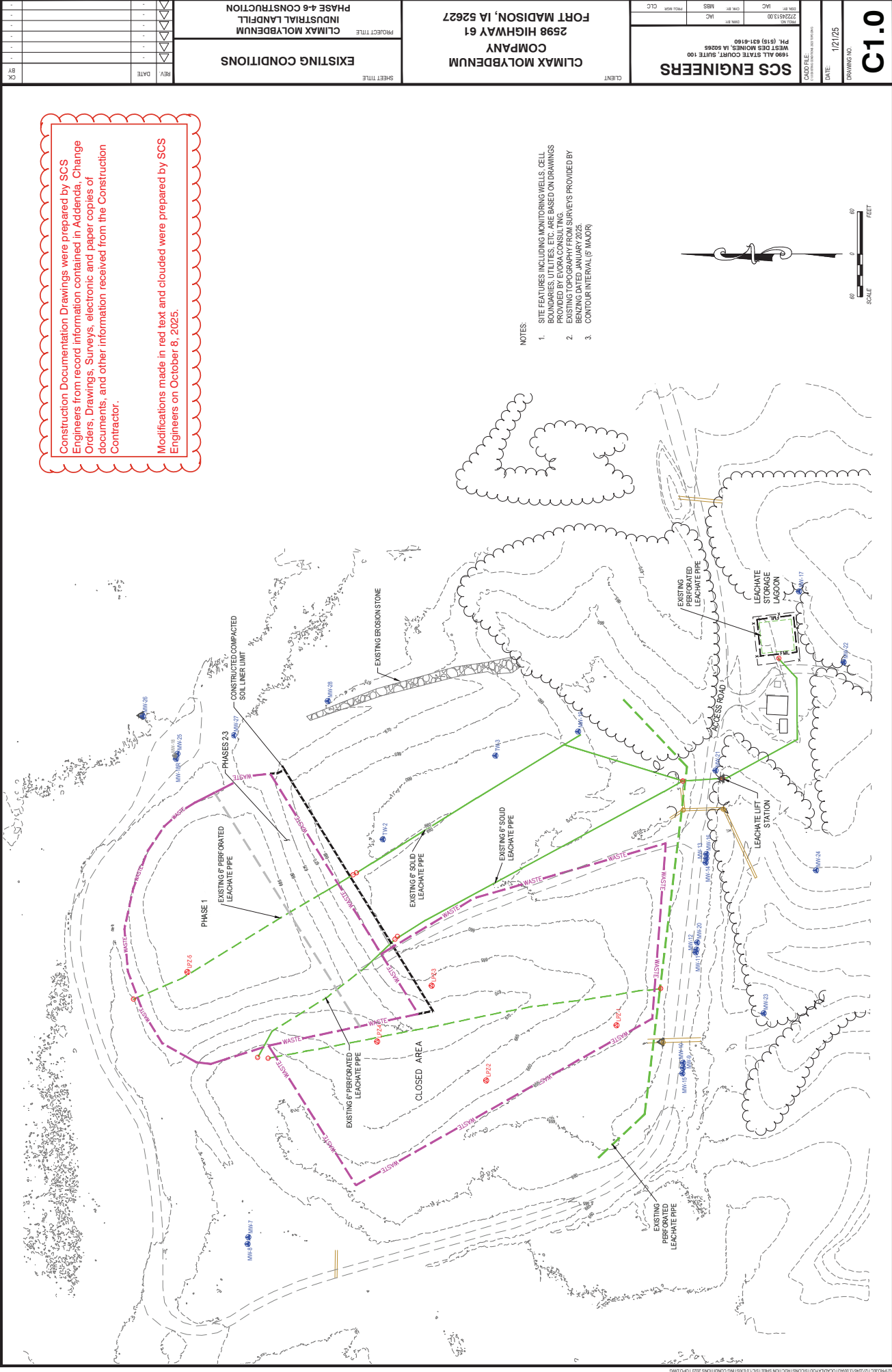
Construction Documentation Drawings were prepared by SCS Engineers from record information contained in Addenda, Change Orders, Drawings, Surveys, electronic and paper copies of documents, and other information received from the Construction Contractor.

Modifications made in red text and clouded were prepared by SCS Engineers on October 8, 2025.



Sheet List Table	
Sheet Number	Sheet Title
C0.0	COVER
C0.1	LEGEND AND NOTES
C1.0	EXISTING CONDITIONS
C1.1	BORROW AND STAGING AREAS
C3.0	TOP OF LINER DESIGN PHASES 4-13
C3.1	TOP OF LINER PHASES 4-6
C3.2	LEACHATE AND DRAINAGE LAYER PHASES 4-6
C3.3	SITE RESTORATION AND SEEDING
C5.0	LINER SYSTEM DETAILS
C5.1	LEACHATE COLLECTION SYSTEM DETAILS
C5.2	STORMWATER DETAILS

NOTES:
SHEET DIVISIONS C2.0 AND C4.0 ARE NOT APPLICABLE TO THIS SHEET SET AND HAVE BEEN OMITTED.



Construction Documentation Drawings were prepared by SCS Engineers from record information contained in Addenda, Change Orders, Drawings, Surveys, electronic and paper copies of documents, and other information received from the Construction Contractor.

Modifications made in red text and clouded were prepared by SCS Engineers on October 8, 2025.

NOTES:

1. SITE FEATURES INCLUDING MONITORING WELLS, CELL BOUNDARIES, UTILITIES, ETC. ARE BASED ON DRAWINGS PROVIDED BY EVORA CONSULTING.
2. EXISTING TOPOGRAPHY FROM SURVEYS PROVIDED BY EVORA CONSULTING.
3. CONTOUR INTERVAL: 5' (MAD09)

SCS ENGINEERS
1690 ALL STATE COURT, SUITE 100
WEST DES MOINES, IA 50265
PH: (515) 653-8100
FAX: (515) 653-8100
WWW.SCS-ENGINEERS.COM

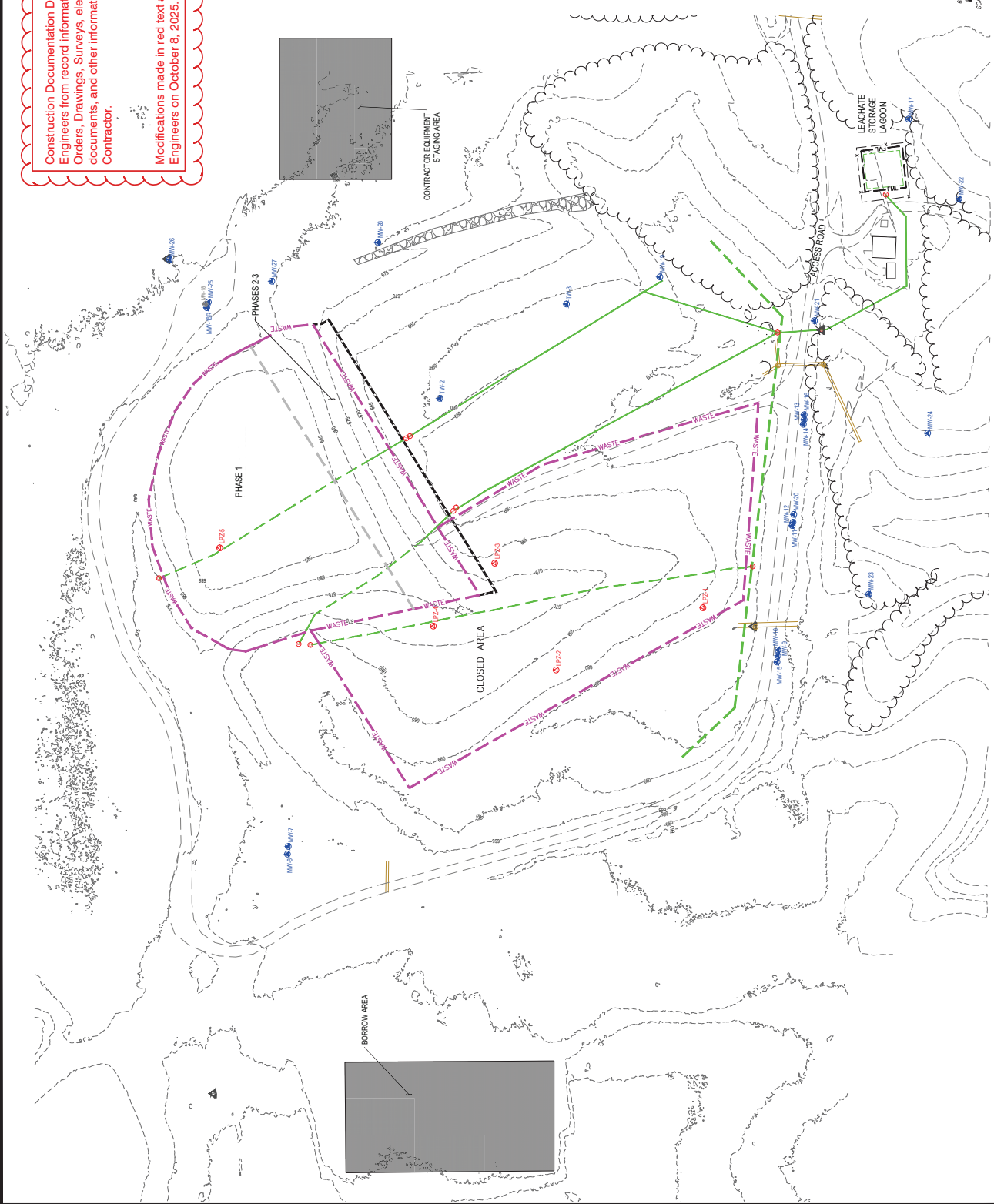
CLIENT
CLIMAX MOLYBDENUM
COMPANY
2598 HIGHWAY 61
FORT MADISON, IA 52627

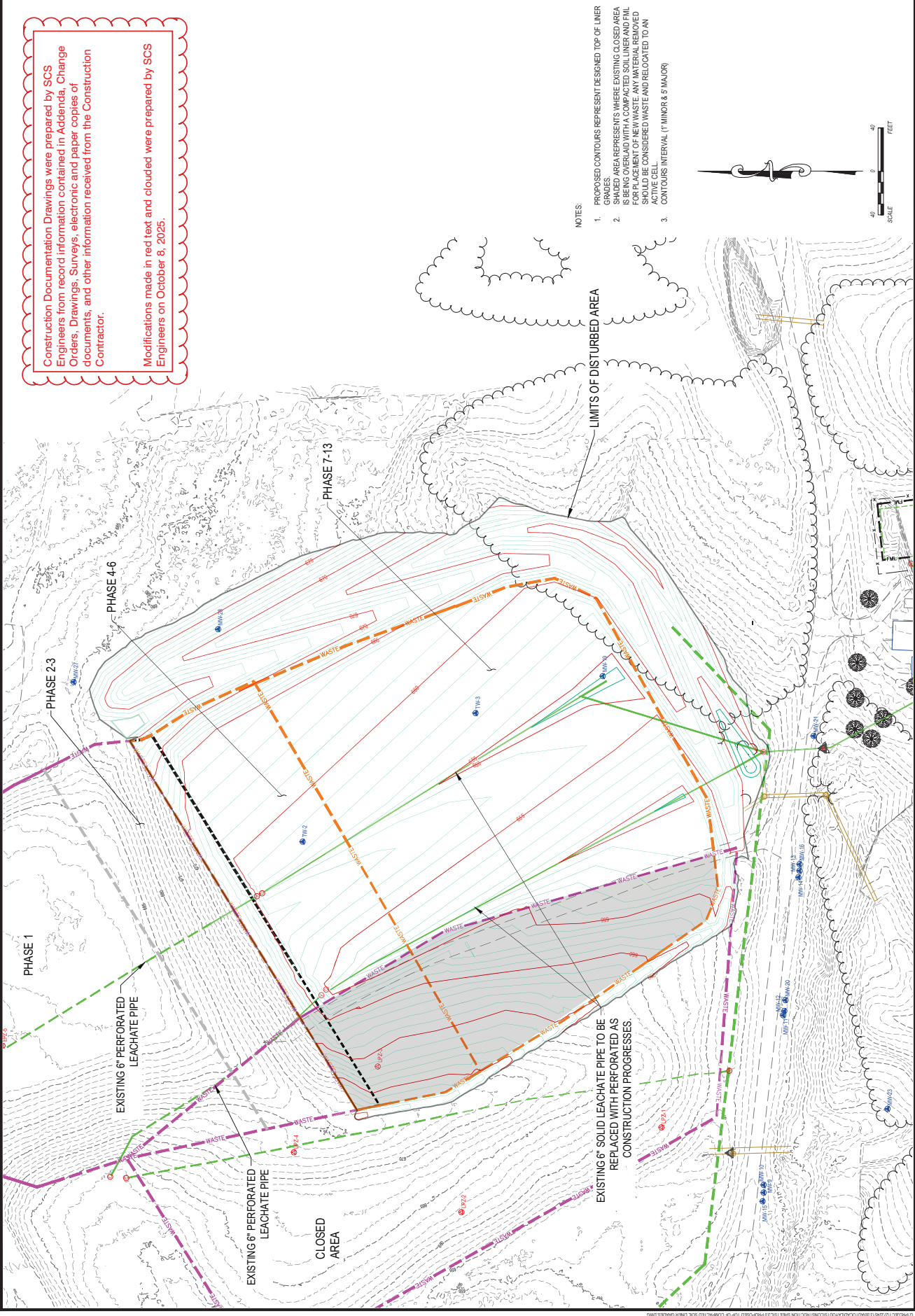
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CLIMAX MOLYBDENUM
INDUSTRIAL LANDFILL
PHASE 4-6 CONSTRUCTION

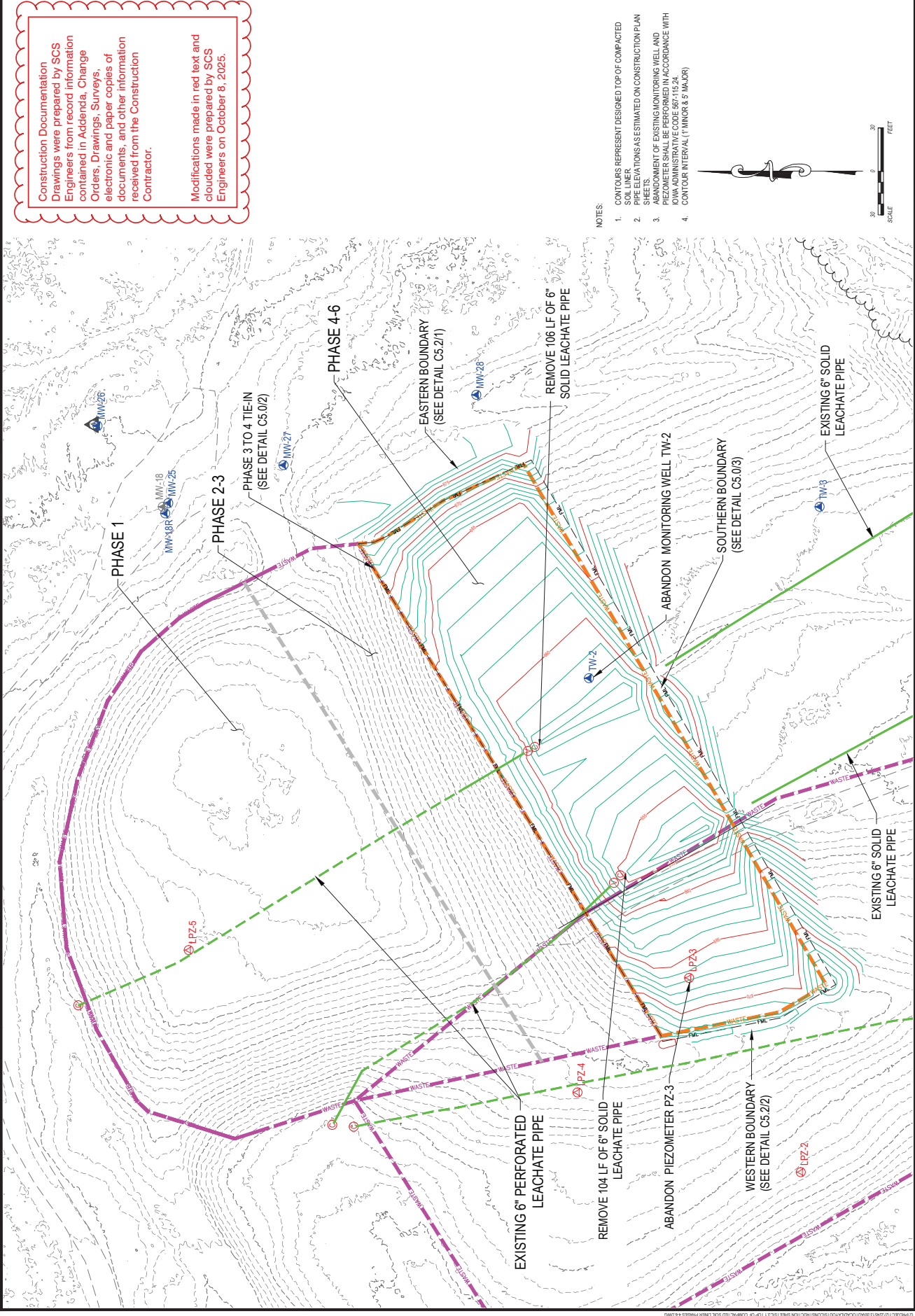
SHEET TITLE
EXISTING CONDITIONS

DATE
12/1/25

DRAWING NO.
C1.0



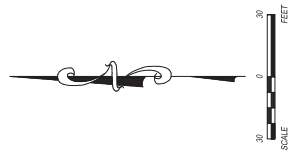




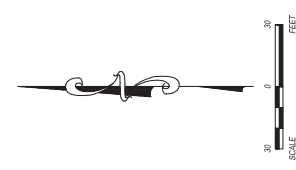
Construction Documentation
 Drawings were prepared by SCS
 Engineers from record information
 contained in Addenda, Change
 Orders, Drawings, Surveys,
 electronic and paper copies of
 documents, and other information
 received from the Construction
 Contractor.

Modifications made in red text and
 clouded were prepared by SCS
 Engineers on October 8, 2025.

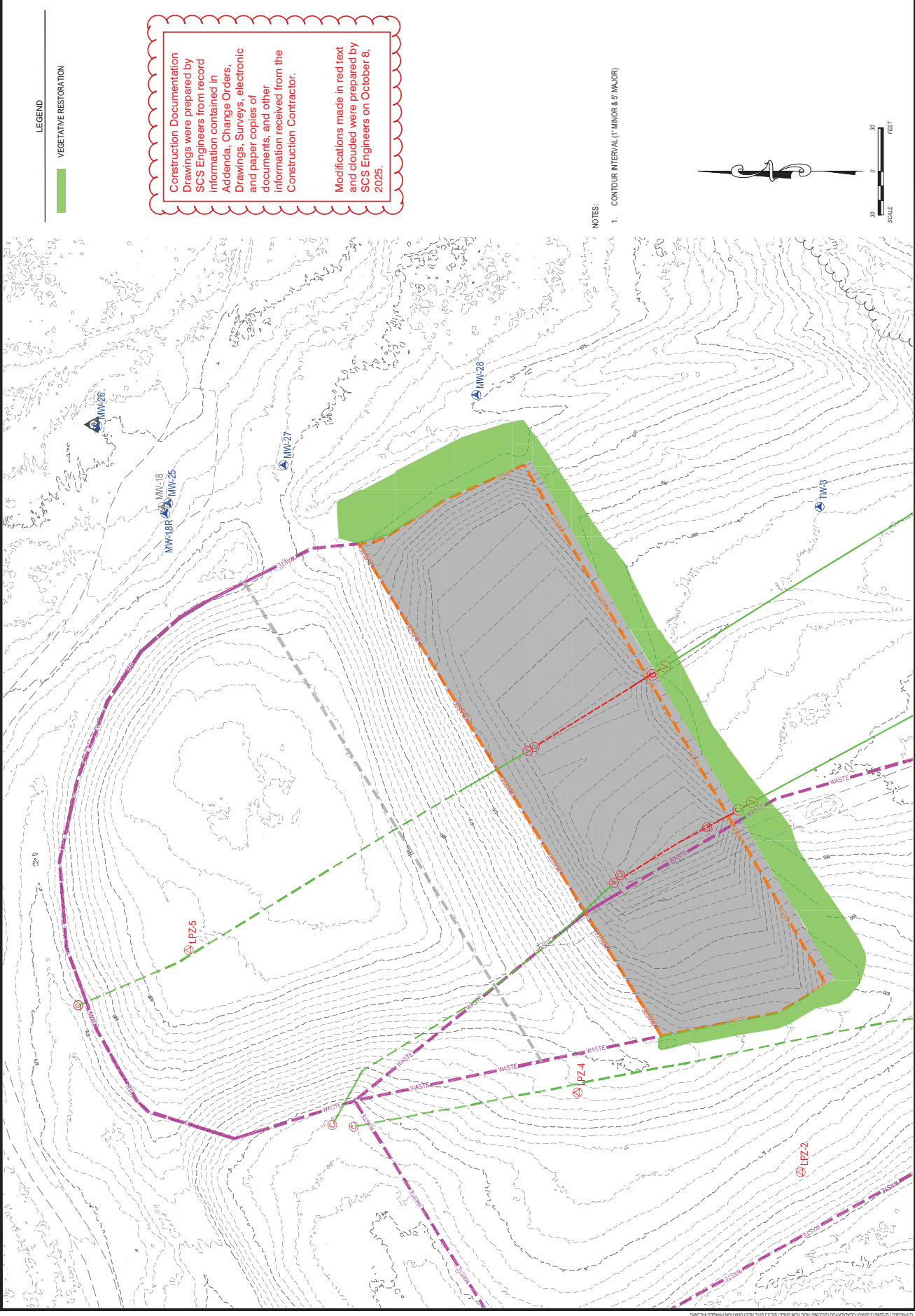
- NOTES:
1. CONTOURS REPRESENT DESIGNED TOP OF COMPACTED SOIL LINER. ELEVATIONS ARE ESTIMATED ON CONSTRUCTION PLAN SHEETS.
 2. ABANDONMENT OF EXISTING MONITORING WELL AND PIEZOMETER SHALL BE PERFORMED IN ACCORDANCE WITH IOWA ADMINISTRATIVE CODE 567-115.24.
 3. CONTOUR INTERVAL (1 MINOR & 5 MAJOR)



Modifications made in red text and clouded were prepared by SCS Engineers on October 8, 2025.



- NOTES:
1. SHADED AREA REPRESENTS EXTENTS OF CLAY LINER
 2. CONTOUR INTERVAL (1' MINOR & 5' MAJOR)



Modifications made in red text and clouded were prepared by SCS Engineers on October 8, 2025.



- 2** PHASE 3 TO 4 TIE IN DETAIL



- 3 SOUTHERN TEMPORARY BERM DETAIL**
NOT TO SCALE



- 3** **SOUTHE**
NOT TO SCALE

NOTES:
1) SUITABLE TOOLS SHOULD BE USED TO ENSURE ADEQUATE COMPACTION OF CLAY LINER UNDER LEACHATE COLLECTION PIPE

CLIMAX MOLYBDENUM
COMPANY
2598 HIGHWAY 61
FORT MADISON, IA 52627

DATE	2/24/15	BY	CJD
TIME	10:00 AM	BY	CJD
DATE	2/24/15	BY	CJD
TIME	10:00 AM	BY	CJD

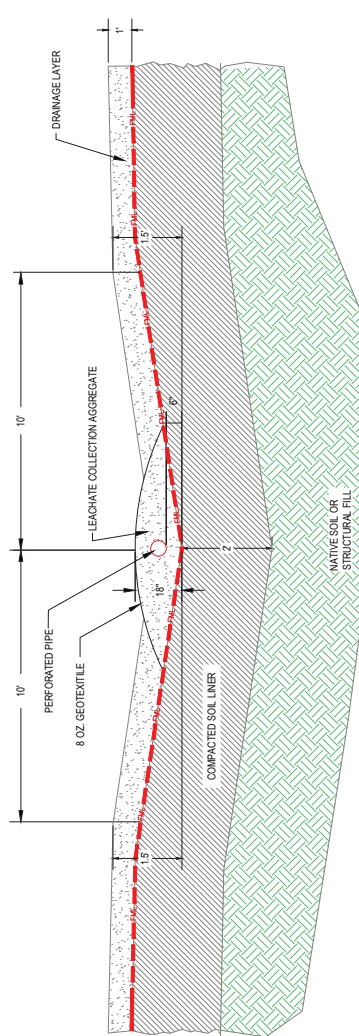
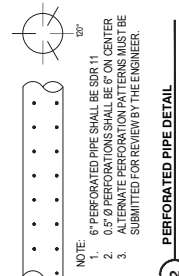
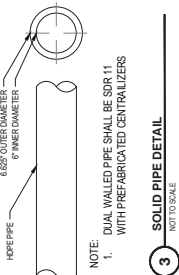
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OMAHA, NE 68144
14755 GROVER STREET

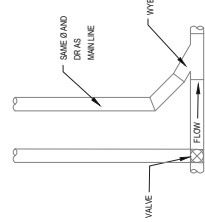
SCS ENGINEERS

DATE:	2/28/25
DRAWING NO.	
CADD FILE:	
CAD FILE NO.	

C5.0



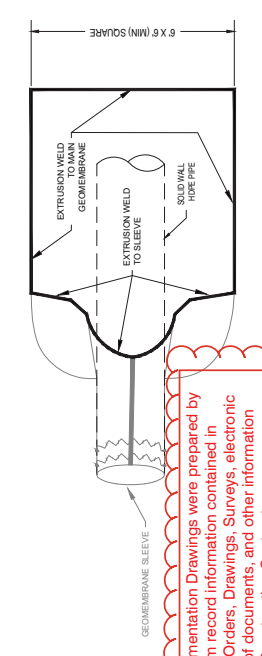
1 LEACHATE COLLECTION TRENCH DETAIL - TYPICAL



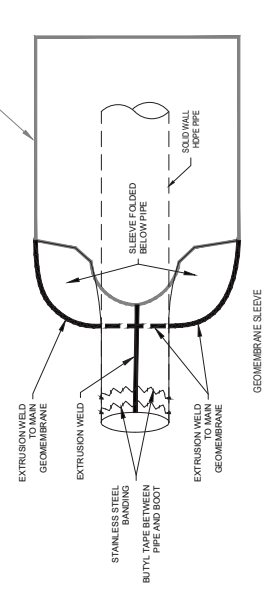
4 TYPICAL CLEANOUT DETAIL
NOT TO SCALE

NOTES:

- 1) CLEANOUTS SHALL EXTEND 3 FEET ABOVE GRADE AND CAPPED WITH VENTED CAPS (NON-PRESSURIZED LINES) OR THREADED FLANGED & BOLTED (PRESSURIZED LINES).
- 2) CLEANOUTS SHALL INCLUDE A 30" TO 45" WYE AND SWEEP USING 22.5" OR LESS SEGMENTS.



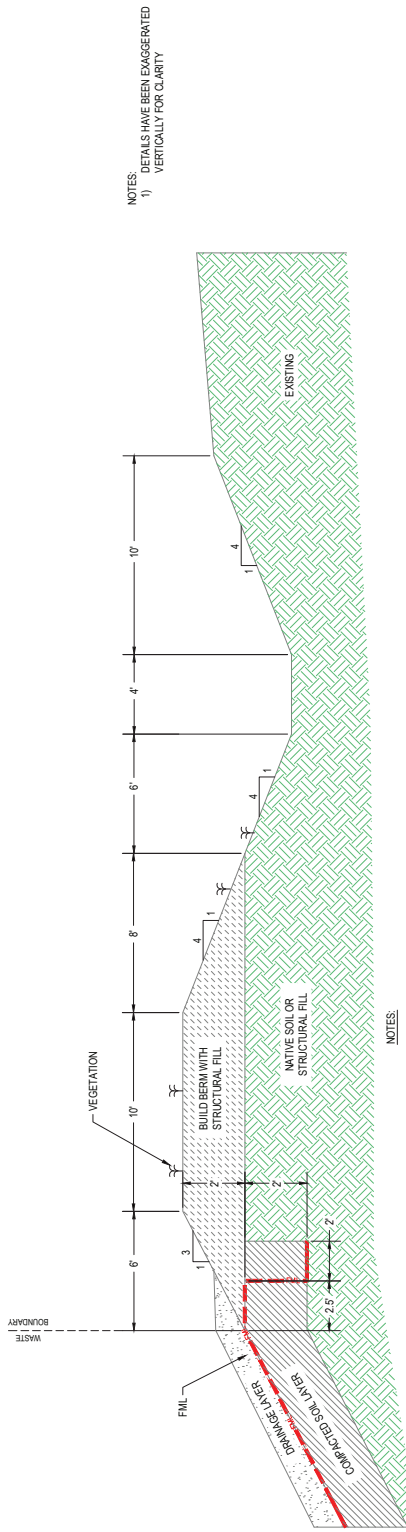
6 LEACHATE PIEZOMETER DETAIL



NOTES:

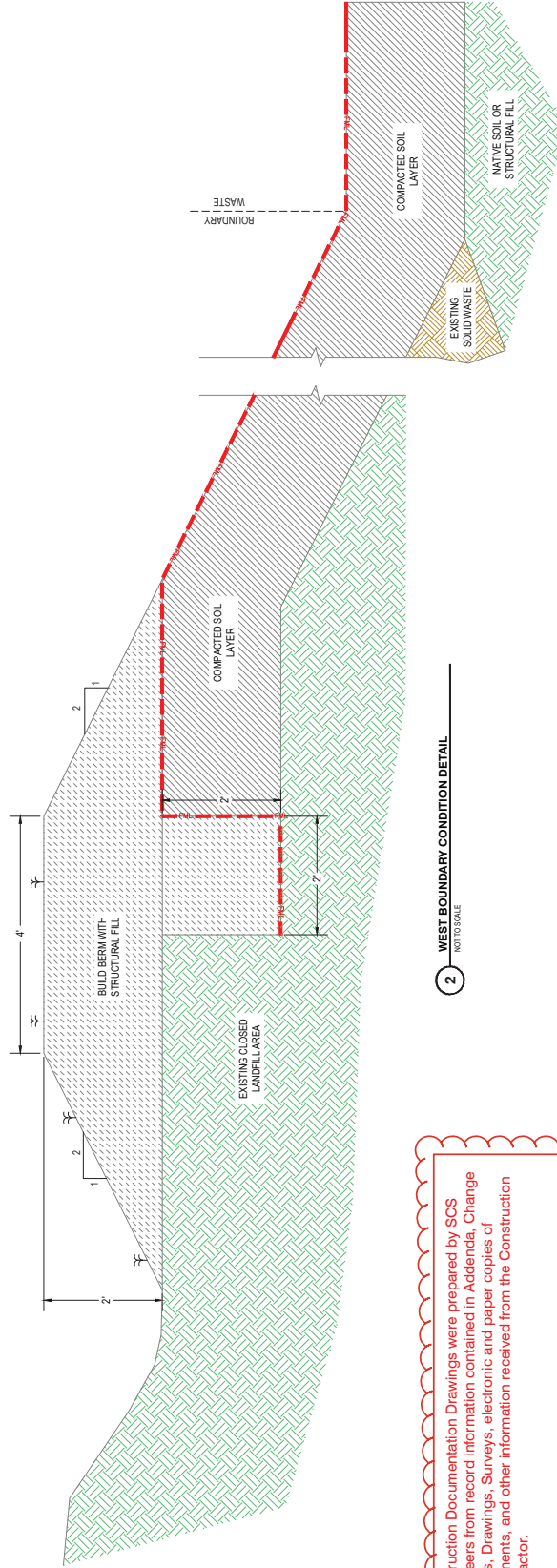
1) ALTERNATE PIPE BOOT CONFIGURATIONS MAY BE ACCEPTABLE, AS DETERMINED BY THE ENGINEER.

Construction Documentation Drawings were prepared by SCS Engineers from record information contained in Addenda, Change Orders, Drawings, Surveys, electronic and paper copies of documents, and other information received from the Construction Contractor.	Modifications made in red text and clouded were prepared by SCS Engineers on October 8, 2025.
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NOTES:
1) DETAILS HAVE BEEN EXAGGERATED
VERTICALLY FOR CLARITY

1 EAST BOUNDARY CONDITION DETAIL
NOT TO SCALE



2 WEST BOUNDARY CONDITION DETAIL
NOT TO SCALE

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Appendix B

Layer Thickness Verification

Point ID	Northing	Easting	Surveyed Subgrade Elevation	Surveyed Top of Compacted Soil Liner Elevation	Compacted Soil Liner Layer Thickness	Surveyed Leachate Drainage Layer Elevation	Leachate Drainage Layer Thickness
1	4111.08	2500.00	671.46	673.81	2.35	675.97	2.16
2	4163.35	2584.88	661.51	663.60	2.09	664.76	1.16
3	4215.62	2669.75	661.64	663.68	2.04	664.70	1.016
4	4267.89	2754.63	663.03	665.10	2.07	666.22	1.116
5	4320.16	2839.51	672.11	674.89	2.78	677.27	2.384
6	4304.91	2842.61	671.51	673.81	2.30	674.86	1.054
7	4271.45	2821.58	662.86	665.00	2.14	666.29	1.287
8	4247.10	2844.21	662.98	664.98	2.00	666.16	1.178
9	4174.85	2808.66	659.17	661.38	2.21	662.48	1.104
10	4248.91	2762.20	659.99	662.09	2.10	663.14	1.046
11	4209.27	2867.63	662.79	665.09	2.30	666.24	1.146
13	4194.59	2703.29	655.07	657.26	2.19	658.54	1.278
14	4193.51	2701.44	654.85	656.86	2.01	657.91	1.048
16	4189.50	2674.48	656.96	659.15	2.19	660.44	1.29
17	4025.01	2549.69	665.46	667.78	2.32	668.97	1.193
18	4151.96	2623.29	653.96	656.07	2.11	657.17	1.099
19	4134.98	2613.71	651.66	653.84	2.18	655.07	1.225
20	4132.39	2610.83	651.79	654.01	2.22	655.12	1.105
21	4230.14	2811.93	661.11	663.30	2.19	664.52	1.22
22	4136.14	2582.78	657.70	660.10	2.40	661.17	1.071
23	4097.12	2515.27	667.87	670.03	2.16	671.12	1.089
24	4030.00	2516.31	669.21	671.38	2.17	672.52	1.137
25	4060.88	2612.45	657.95	660.01	2.06	661.11	1.099
26	4078.32	2642.49	650.03	652.30	2.27	653.56	1.26
27	4080.17	2645.58	649.90	651.93	2.03	654.64	2.706
28	4131.65	2734.13	654.44	657.22	2.78	658.27	1.052
29	4137.30	2743.81	654.98	657.13	2.15	658.14	1.01
30	4220.15	2888.00	669.02	671.07	2.05	673.02	1.949
31	4205.97	2894.16	672.28	674.30	2.02	675.32	1.021
32	4160.99	2816.71	663.12	665.24	2.12	666.31	1.069
33	4120.90	2747.67	657.83	660.46	2.63	661.52	1.055
34	4107.25	2724.14	660.24	662.48	2.24	663.61	1.126
35	4121.24	2716.32	656.52	658.59	2.07	659.65	1.056
36	4066.28	2653.61	653.33	655.83	2.50	657.12	1.289
37	4064.92	2650.32	653.89	656.03	2.14	657.12	1.093
38	4042.95	2613.44	662.74	664.95	2.21	666.03	1.076
39	4010.72	2557.94	669.52	671.72	2.20	672.96	1.235
40	3997.63	2535.40	671.89	674.20	2.31	675.54	1.336
41	4075.73	2554.41	663.90	665.96	2.06	667.06	1.101
42	4137.46	2661.76	654.36	656.37	2.01	657.39	1.02
43	4185.53	2746.01	657.16	659.26	2.10	660.47	1.213



Appendix C

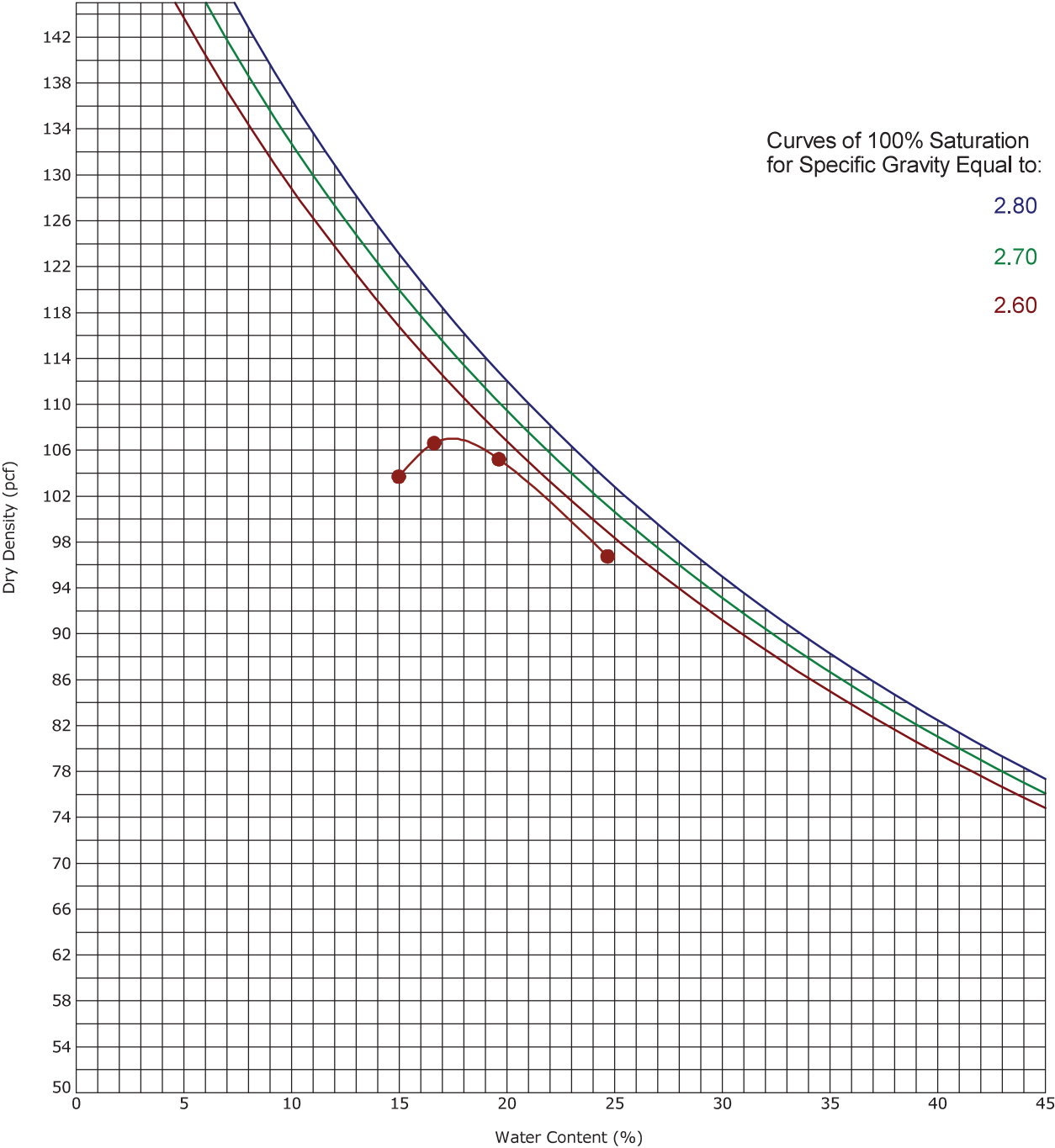
Compacted Soil Liner Test Results



Appendix C1

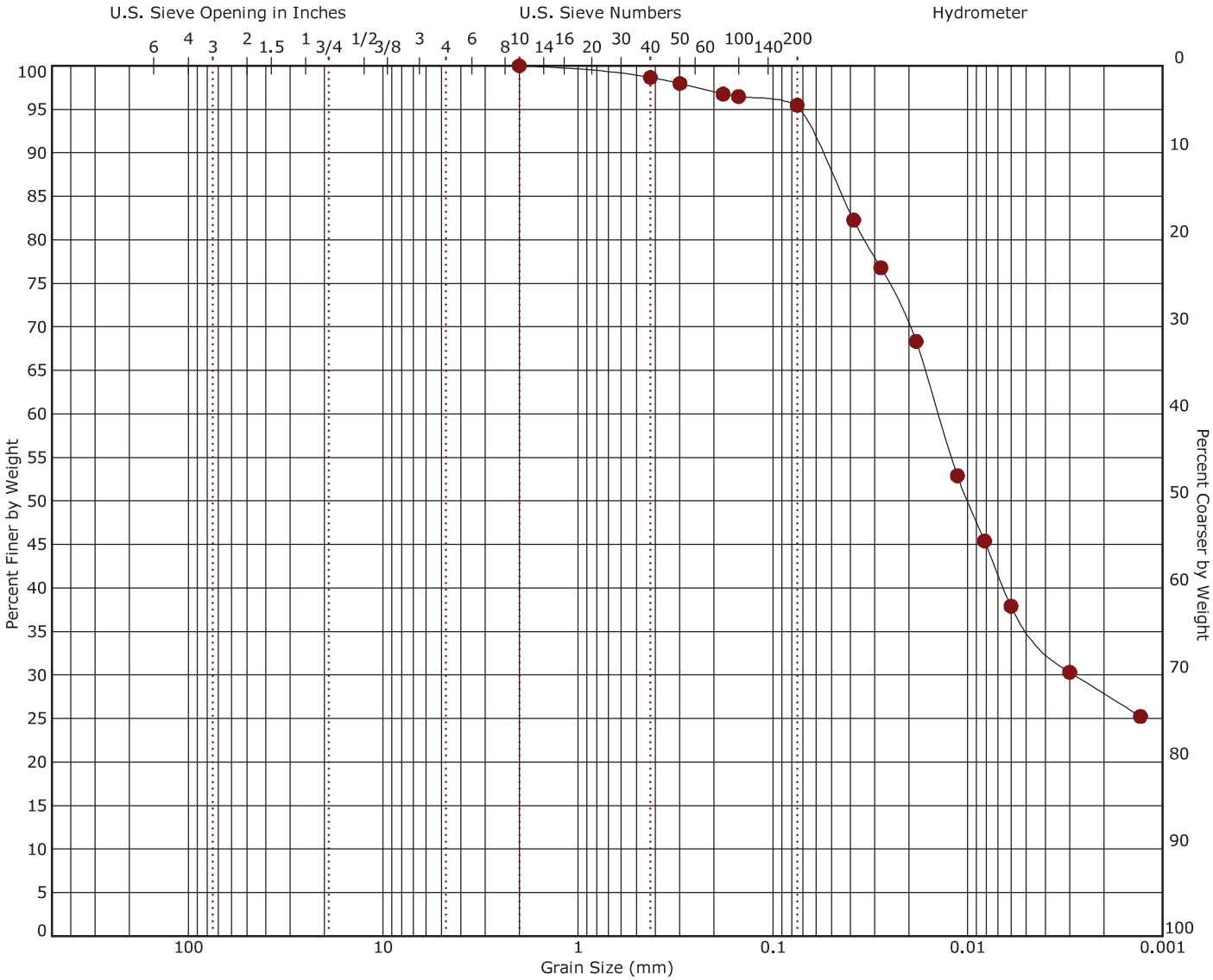
Compacted Soil Liner Source Testing

Moisture-Density Relationship
ASTM D698-Method A



Sample Identification					Description of Materials		
Borrow Clay					LEAN CLAY(CL)		
Fines (%)	Fraction > mm size	LL	PL	PI	Test Method	Maximum Dry Density (pcf)	Optimum Water Content (%)
95	0.0	37	20	17	ASTM D698-Method A	107.0	17.4

Grain Size Distribution
ASTM D422 / ASTM C136 / AASHTO T27



Cobbles		Gravel		Sand			Silt or Clay					
		coarse	fine	coarse	medium	fine						
Sample ID		Description					USCS	LL	PL	PI	Cc	Cu
●	Borrow Clay	LEAN CLAY					CL	37	20	17		
Sample ID		D ₁₀₀	D ₆₀	D ₃₀	D ₁₀	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay	
●		2	0.014	0.003		0.0	0.0	4.5		59.6	35.9	

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 16 METHOD C TEST WITH INCREASING TAILWATER LEVEL



PROJECT NAME: SCS Waste Sludge Testing				PROJECT NO.: 08245268		CITY, STATE: Fort Madison, IA			
SAMPLE ID: 1				TEST DATE: 12/19/2024		PROJECT LOCATION: Fort Madison, IA			
DESCRIPTION: Brown Lean Clay Trace Gravel				Cross Sectional Area: 0.852 cm ²					
LIQUID LIMIT:		PLASTIC LIMIT:		PERCENT FINES:					

MOISTURE%		DENSITY		SPEC GRAV (G _s): 2.70		REMOLD (Y/N): Y	
WET + TARE, g:	118.53	WET WT, g:	610.0	ASSUMED G _s (Y/N): Y		PROCTOR: 108.9	
DRY + TARE, g:	103.96	DIA, in:	2.84	POROSITY, %: 38.4		OPTIMUM: 18.2	
TARE, g:	23.56	HT, in:	2.99	SATURATION, %: 78.3		COMPACTION, %: 95.3	
MOISTURE %:	18.1	AREA, in ² :	6.335	VOID RATIO: 0.62		OVER OPTIMUM, %: -0.1	
		WET DENSITY:	122.6	PCF			
		DRY DENSITY:	103.8	PCF			

SATURATION:	CHAMBER PRESS.:	65.0	psi	BACK PRESSURE (=UPPER=LOWER):	60.0	psi	B VALUE:		
TEST:	CHAMBER PRESS.:	65.0	psi	UPPER:	60.0	psi	LOWER:	61.5	psi
	EFFECT. CONSOL. STRESS:	5.0	psi	BIAS PRESSURE (=LOWER-UPPER)	1.5	psi			

Upper	Lower	ELAPSED	DELTA			OUT	IN					
cm	cm	TIME	H	L _n	HYD CON	FLOW	FLOW	OUT/IN	HYD	% FROM	TEMP.:	TEMP.
		min	cm	H1/H2	k. cm/sec	cm ³	cm ³	RATIO	GRAD	MEAN k	C	CORR.:
3.1	21.2		18.1									
3.3	21.0	60.00	17.7	0.003158	6.80E-08	0.2	0.2	1.00	16.2	0	21.1	0.978
3.5	20.8	120.00	17.3	0.003168	6.82E-08	0.2	0.2	1.00	16.1	0	21.1	0.978
3.7	20.7	180.00	16.9	0.003178	6.84E-08	0.2	0.2	1.00	16.1	0	21.1	0.978
3.9	20.5	240.00	16.6	0.003188	6.86E-08	0.2	0.2	1.00	16.0	0	21.1	0.978

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 6.8E-08 cm/sec** 0.002

FINAL MOISTURE%		FINAL DENSITY		SPEC GRAV (G _s): 2.70	
WET + TARE, g:	890.20	WET WT, g:	612.6	ASSUMED G _s (Y/N): Y	
DRY + TARE, g:	759.80	DIA, in:	2.85	POROSITY, %: 41.8	
TARE, g:	277.80	HT, in:	2.99	SATURATION, %: 99.9	
MOISTURE %:	27.1	AREA, in ² :	6.379	VOID RATIO: 0.72	
		WET DENSITY:	122.3	PCF	
		DRY DENSITY:	96.3	PCF	

CONDUCTIVITY

TIME, minutes

610 N. 4th Street
Suite 100
Burlington, IA 52601
Phone: 319-753-0816
Fax: 319-752-3605

Client:
SCS Engineers
1690 All State Court
Ste 100
West Des Moines, IA 50625

Project:
25-2130 (4271)
SCS Engineers - Climax Project (4271)
1690 Allstate Court
West Des Moines, IA

General Information

Sample Number:	4772	Sample Date:	09/10/2025
Sample From:		Sampling Method:	
Location Details:	Sample # 1 (2' - 10' Deep)		
Material Type:	Not Given	Technician:	Client

Test Results

Soil Classification: (CL) Lean Clay

Material Description: Lean Clay (CL) Light Brown Mottle Gray, Silty, Moist (2'-10')

Sample Preparation Method Used: Dry

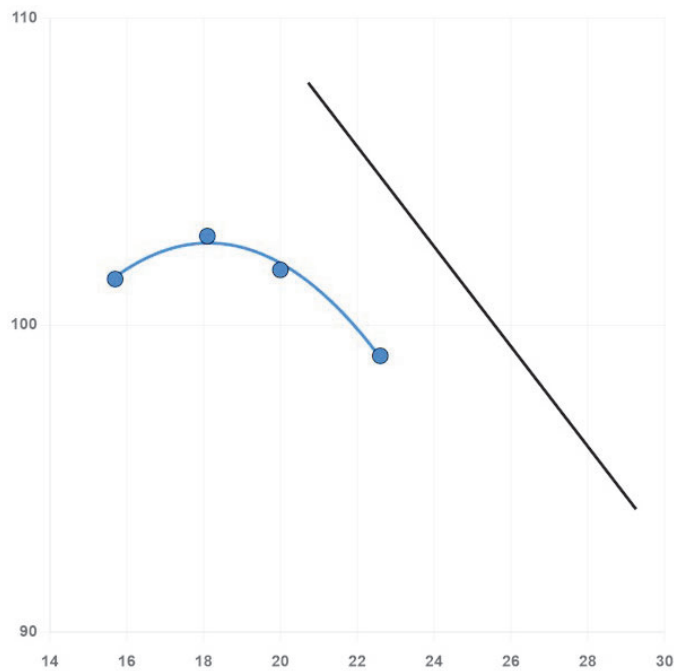
% Water from As Received Sample: 17.6

% Retain from 4.75 mm (No. 4) Sieve:

% Passing 4.75 mm (No. 4) Sieve:

Compaction Method Used: A (ASTM D698)

Type of Rammer Used: Manual



Specific Gravity of Sample: 2.70

Maximum Dry Density (lb/ft³): 102.3

Optimum Moisture (%): 16.3

Test Completed Date: 09/12/2025

Test Completed By: Nicholas Lerud

610 N. 4th Street
Suite 100
Burlington, IA 52601
Phone: 319-753-0816
Fax: 319-752-3605

Client:
SCS Engineers
1690 All State Court
Ste 100
West Des Moines, IA 50625

Project:
25-2130 (4271)
SCS Engineers - Climax Project (4271)
1690 Allstate Court
West Des Moines, IA

General Information

Sample Number:	4773	Sample Date:	09/10/2025
Sample From:		Sampling Method:	
Location Details:	Sample # 2 (10' - 14' Deep)		
Material Type:		Technician:	Client

Test Results

Soil Classification: (CL) Lean Clay

Material Description: Lean Clay (CL) Yellow Brown Mottle Gray, Silty, Moist

Sample Preparation Method Used: Dry

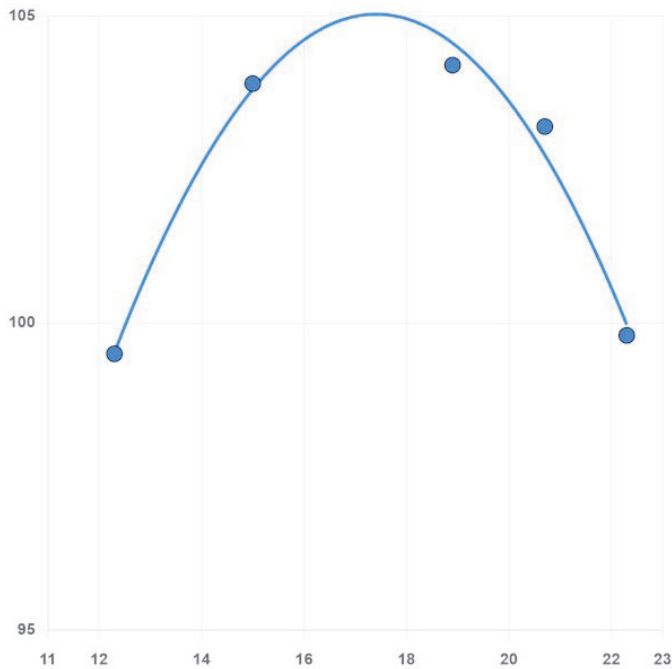
% Water from As Received Sample: 17.0

% Retain from 4.75 mm (No. 4) Sieve:

% Passing 4.75 mm (No. 4) Sieve:

Compaction Method Used: A (ASTM D698)

Type of Rammer Used: Manual



Maximum Dry Density (lb/ft³): 106.0

Optimum Moisture (%): 17.3

Test Completed Date: 09/12/2025

Test Completed By: Eric Walechka

Appendix C2

Compacted Soil Liner Moisture & Density

Field Test Records

SCS ENGINEERS - Nuclear Density Gauge Test Record

Note: This is a PROPOSED SPREADSHEET for the internal use by SCS Engineers ONLY. Those that use this spreadsheet without authorization by SCS Engineers will be held responsible for any errors that arise from being programmed into the page, which render the output unreliable should construction codes not be followed precisely.

Client Name: Climax Mayfield
SCS Engineers Proj Name: Climax Mayfield Monorail Landfill, Phases 4-6
SCS Engineers Proj No.: 2722451.3.00
Project Location: Climax Mayfield Monorail Landfill
2749 Highway 27, Argyle, Iowa 52619

Test Number Formatting Legend for GGLTTR
Grid Designation = G6 0001 - 5199
Lift Designation = LL 000.01 - 000.99
Test Designation = TT 000.00001 - 000.00.99
Rebar Designation = RB 000.00001 - 000.00.00.9

ver 2025 - v7 Beta 1M (b)/rdb: valid through 12/31/2023 v1



Print Failures Only Insert (X)

Max #	Source Area	% Area DD for ET Cover
1	Borrow Clay	
2		
3		
4		
5		
6		
7		

0

Note: Comments on this row apply to the lot data density entry above it & data sets are not entered >>>

NSPT Range Correction =

Item	Date	Numeric Input	Test #	Material Designation	Lift (6-inch bucket)	Probe Depth (in)	Wat Density (pcf)	Water Weight (pcf)	Dry Density (pcf)	Moisture Content (%)	Percent Compaction	Pass / Fail	Comments: (Automatic and Manual)	ET cover
1	09/08/25	GGLTTR 01.01.01	01.01.01	2	1 to 99	6.0 in	114.50 pcf	18.20 pcf	96.7 pcf	18.8%	94.5%	FAIL	MC or DD Low Dry Den	
2	09/08/25	01.01.02	01.01.02	2	1	6.0 in	116.20 pcf	18.40 pcf	97.8 pcf	18.8%	95.6%	P		
3	09/08/25	01.01.03	01.01.03	2	1	6.0 in	118.00 pcf	18.90 pcf	99.1 pcf	19.1%	96.9%	P		
4	09/08/25	01.01.04	01.01.04	2	1	6.0 in	115.40 pcf	16.80 pcf	98.6 pcf	17.0%	96.4%	P		
5	09/08/25	01.01.01	01.01.01	2	1	6.0 in	124.20 pcf	23.20 pcf	101.0 pcf	23.0%	98.7%	P		
6	09/09/25	01.01.01.1	01.01.01.1	2	1	4.0 in	122.90 pcf	21.60 pcf	101.3 pcf	21.3%	99.0%	P	Retest Passed	
7	09/09/25	02.01.02	02.01.02	2	1	6.0 in	123.90 pcf	24.50 pcf	99.4 pcf	24.6%	97.2%	P		
8	09/09/25	02.01.02.1	02.01.02.1	2	1	4.0 in	115.60 pcf	24.80 pcf	90.8 pcf	27.3%	88.8%	FAIL	HighMC and Retest Failed	
9	09/09/25	02.01.03	02.01.03	2	1	6.0 in	111.00 pcf	25.10 pcf	85.9 pcf	29.2%	84.0%	FAIL	HighMC and Retest Failed	
10	09/09/25	02.01.03.1	02.01.03.1	2	1	4.0 in	104.00 pcf	19.70 pcf	84.2 pcf	23.5%	82.3%	FAIL	Low Dry Den and Retest Failed	
11	09/09/25	02.01.04	02.01.04	2	1	6.0 in	121.60 pcf	20.70 pcf	100.9 pcf	20.5%	98.6%	P		
12	09/09/25	02.01.04.1	02.01.04.1	2	1	4.0 in	117.40 pcf	23.30 pcf	94.1 pcf	24.8%	92.0%	FAIL	Low Dry Den and Retest Failed	
13	09/09/25	02.01.05	02.01.05	2	1	6.0 in	125.60 pcf	27.20 pcf	98.4 pcf	27.6%	96.2%	FAIL	HighMC Retest Passed	
14	09/09/25	02.01.05.1	02.01.05.1	2	1	4.0 in	119.30 pcf	20.90 pcf	98.4 pcf	21.2%	96.2%	P		
15	09/09/25	05.01.06	05.01.06	2	1	6.0 in	124.80 pcf	17.90 pcf	106.7 pcf	16.7%	104.5%	P		
16	09/09/25	05.01.07	05.01.07	2	1	6.0 in	120.30 pcf	19.60 pcf	99.6 pcf	20.8%	97.4%	P		
17	09/09/25	05.01.08	05.01.08	2	1	6.0 in	123.60 pcf	19.40 pcf	104.2 pcf	18.6%	101.9%	P		
18	09/09/25	05.01.09	05.01.09	2	1	6.0 in	122.80 pcf	20.00 pcf	102.8 pcf	19.5%	100.5%	P		
19	09/09/25	05.01.10	05.01.10	2	1	6.0 in	126.20 pcf	25.70 pcf	100.5 pcf	25.6%	98.2%	P		
20	09/09/25	05.01.10.1	05.01.10.1	2	1	4.0 in	123.90 pcf	18.30 pcf	103.6 pcf	17.3%	103.2%	P	Retest Passed	
21	09/09/25	05.01.11	05.01.11	2	1	6.0 in	120.50 pcf	19.60 pcf	100.9 pcf	19.4%	99.5%	P		
22	09/09/25	05.01.11.1	05.01.11.1	2	1	4.0 in	118.20 pcf	16.40 pcf	101.8 pcf	16.1%	98.5%	FAIL	Low MC and Retest Failed	
23	09/10/25	05.01.01	05.01.01	2	1	4.0 in	121.30 pcf	18.00 pcf	103.3 pcf	17.4%	101.0%	P		
24	09/10/25	05.01.02	05.01.02	2	1	4.0 in	116.70 pcf	18.10 pcf	98.6 pcf	18.4%	96.4%	P		
25	09/10/25	05.01.03	05.01.03	2	1	4.0 in	112.60 pcf	16.50 pcf	96.1 pcf	17.2%	93.9%	FAIL	Low Dry Den	
26	09/10/25	05.01.04	05.01.04	2	1	6.0 in	123.10 pcf	19.80 pcf	103.3 pcf	19.2%	101.0%	P		
27	09/10/25	05.01.04.1	05.01.04.1	2	1	4.0 in	126.30 pcf	19.60 pcf	104.7 pcf	18.4%	104.3%	P	Retest Passed	
28	09/10/25	05.01.05	05.01.05	2	1	6.0 in	124.90 pcf	20.20 pcf	104.2 pcf	19.3%	102.3%	P		
29	09/10/25	05.02.01	05.02.01	2	2	8.0 in	118.90 pcf	20.30 pcf	98.7 pcf	20.5%	94.5%	P		
30	09/10/25	05.02.02	05.02.02	2	2	8.0 in	124.30 pcf	20.70 pcf	103.0 pcf	19.9%	101.5%	P		
31	09/10/25	05.02.03	05.02.03	2	2	8.0 in	118.10 pcf	20.10 pcf	98.0 pcf	20.5%	93.8%	P		
32	09/10/25	05.02.04	05.02.04	2	2	8.0 in	119.40 pcf	21.10 pcf	98.3 pcf	21.5%	96.1%	P		
33	09/10/25	05.02.05	05.02.05	2	2	8.0 in	122.70 pcf	20.40 pcf	102.3 pcf	19.9%	100.0%	P		
34	09/10/25	05.02.06	05.02.06	2	2	8.0 in	120.20 pcf	21.30 pcf	98.9 pcf	21.5%	96.7%	P		
35	09/10/25	05.02.07	05.02.07	2	2	8.0 in	115.70 pcf	18.20 pcf	97.5 pcf	18.7%	95.3%	P		
36	09/10/25	05.02.08	05.02.08	2	2	8.0 in	124.50 pcf	19.80 pcf	104.7 pcf	18.9%	102.3%	P		
37	09/11/25	05.03.01	05.03.01	2	3	8.0 in	122.90 pcf	17.40 pcf	105.5 pcf	16.5%	103.1%	P		
38	09/11/25	05.03.02	05.03.02	2	3	8.0 in	123.70 pcf	18.00 pcf	105.7 pcf	17.0%	103.3%	P	Retest Passed	
39	09/11/25	05.03.01.1	05.03.01.1	2	3	6.0 in	116.90 pcf	19.30 pcf	97.6 pcf	19.8%	95.4%	P		
40	09/11/25	05.03.02.1	05.03.02.1	2	3	6.0 in	115.60 pcf	15.90 pcf	99.7 pcf	15.9%	97.5%	FAIL	Low MC and Retest Failed	
41	09/11/25	04.01.01	04.01.01	2	1	8.0 in	129.10 pcf	18.30 pcf	110.8 pcf	16.5%	108.3%	P		
42	09/11/25	04.01.02	04.01.02	2	1	8.0 in	127.40 pcf	18.50 pcf	108.9 pcf	17.0%	106.5%	P		
43	09/11/25	04.01.03	04.01.03	2	1	6.0 in	115.90 pcf	17.90 pcf	97.9 pcf	18.3%	95.7%	P		
44	09/11/25	03.01.01	03.01.01	2	1	6.0 in	118.70 pcf	17.70 pcf	101.0 pcf	17.5%	98.7%	P		
45	09/11/25	03.01.02	03.01.02	2	1	6.0 in	116.20 pcf	18.20 pcf	98.0 pcf	18.6%	95.8%	P		
46	09/11/25	03.01.03	03.01.03	2	1	6.0 in	119.80 pcf	17.40 pcf	102.4 pcf	17.0%	100.1%	P		
47	09/11/25	03.01.04	03.01.04	2	1	6.0 in	113.60 pcf	18.30 pcf	95.3 pcf	19.2%	93.2%	FAIL	Low Dry Den	
48	09/08/25	01.01.05	01.01.05	2	1	6.0 in	126.10 pcf	20.30 pcf	105.8 pcf	19.2%	103.4%	P		
49	09/22/25	04.02.01	04.02.01	2	2	8.0 in	121.30 pcf	19.80 pcf	101.5 pcf	19.5%	99.2%	P		
50	09/22/25	04.02.02	04.02.02	2	2	8.0 in	127.80 pcf	20.20 pcf	107.6 pcf	18.8%	105.2%	P		
51	09/22/25	04.02.03	04.02.03	2	2	8.0 in	120.60 pcf	17.40 pcf	103.2 pcf	16.9%	100.9%	P		
52	09/22/25	03.02.01	03.02.01	2	2	8.0 in	124.20 pcf	19.10 pcf	105.1 pcf	18.2%	102.7%	P		
53	09/22/25	03.02.02	03.02.02	2	2	8.0 in	119.60 pcf	18.80 pcf	100.8 pcf	18.7%	98.5%	P		
54	09/22/25	03.02.03	03.02.03	2	2	8.0 in	123.80 pcf	18.80 pcf	102.6 pcf	17.9%	102.6%	P		
55	09/22/25	03.02.04	03.02.04	2	2	8.0 in	114.80 pcf	20.60 pcf	94.2 pcf	21.9%	92.1%	FAIL	Low Dry Den	

Item	Date	Numeric Input	Test Number	Rebtest #	Material Designation	Lift (6-inch Indirect)	Probe Depth (in)	Wat Density (pcf)	Water Weight (pcf)	Dry Density (pcf)	Moisture Content (%)	Percent Compaction (%)	Pass / Fail	Comments: (Automatic and Manual)			
	MM/DD/YYYY	GG-LLTTR				1 to 99								MC or DD	Rebtest	Manual comments here	ET cover
56	09/22/25	GG-LLTTR	03.02.04.1		2	2	8.0 in	121.40 pcf	19.10 pcf	102.3 pcf	18.7%	100.0%	P		Rebtest Passed		
57	09/22/25	03.02.05.	03.02.05.	R1 OK	2	2	8.0 in	127.10 pcf	18.40 pcf	108.7 pcf	16.9%	106.3%	P				
58	09/22/25	04.03.01.	04.03.01.		2	3	8.0 in	125.90 pcf	20.50 pcf	105.4 pcf	19.4%	103.0%	P				
59	09/22/25	04.03.02.	04.03.02.		2	3	8.0 in	124.30 pcf	21.40 pcf	102.9 pcf	20.8%	100.6%	P				
60	09/22/25	04.03.03.	04.03.03.		2	3	8.0 in	119.20 pcf	17.20 pcf	102.0 pcf	16.9%	99.7%	P				
61	09/22/25	04.03.04.	04.03.04.		2	3	8.0 in	118.30 pcf	18.00 pcf	100.3 pcf	17.9%	98.0%	P				
62	09/24/25	03.03.01.	03.03.01.		2	3	8.0 in	117.50 pcf	18.50 pcf	99.0 pcf	18.7%	96.8%	P				
63	09/24/25	03.03.02.	03.03.02.		2	3	8.0 in	115.90 pcf	18.60 pcf	97.3 pcf	19.1%	95.1%	P				
64	09/24/25	03.03.03.	03.03.03.		2	3	8.0 in	121.10 pcf	20.70 pcf	100.4 pcf	20.6%	98.1%	P				
65	09/24/25	02.02.01.	02.02.01.		2	2	8.0 in	126.80 pcf	17.90 pcf	108.9 pcf	16.4%	106.5%	P				
66	09/24/25	02.02.02.	02.02.02.		2	2	8.0 in	124.00 pcf	20.50 pcf	103.5 pcf	19.8%	101.2%	P				
67	09/24/25	02.02.03.	02.02.03.		2	2	8.0 in	123.20 pcf	21.10 pcf	102.1 pcf	20.7%	99.8%	P				
68	09/24/25	02.02.04.	02.02.04.		2	2	8.0 in	118.70 pcf	18.20 pcf	100.5 pcf	18.1%	98.2%	P				
69	09/24/25	02.02.05.	02.02.05.		2	2	8.0 in	118.00 pcf	17.00 pcf	101.0 pcf	16.8%	98.7%	P				
70	09/24/25	01.02.01.	01.02.01.		2	2	8.0 in	124.80 pcf	20.30 pcf	104.5 pcf	19.4%	102.2%	P				
71	09/24/25	01.02.02.	01.02.02.		2	2	8.0 in	124.10 pcf	21.20 pcf	102.9 pcf	20.6%	100.6%	P				
72	09/24/25	01.02.03.	01.02.03.		2	2	8.0 in	120.80 pcf	19.80 pcf	101.0 pcf	19.6%	98.7%	P				
73	09/24/25	01.02.04.	01.02.04.		2	2	8.0 in	119.70 pcf	17.20 pcf	102.5 pcf	16.8%	100.2%	P				
74	09/24/25	02.03.01.	02.03.01.		2	3	8.0 in	122.30 pcf	17.90 pcf	104.4 pcf	17.1%	102.1%	P				
75	09/24/25	02.03.02.	02.03.02.		2	3	8.0 in	120.50 pcf	18.30 pcf	102.2 pcf	17.9%	99.9%	P				
76	09/24/25	02.03.03.	02.03.03.		2	3	8.0 in	118.10 pcf	18.90 pcf	99.2 pcf	19.1%	97.0%	P				
77	09/24/25	02.03.04.	02.03.04.		2	3	8.0 in	117.80 pcf	17.60 pcf	100.2 pcf	17.6%	97.9%	P				
78	09/24/25	01.03.01.	01.03.01.		2	3	8.0 in	117.90 pcf	16.20 pcf	101.2 pcf	15.9%	99.4%	FAIL	Low MC			
79	09/24/25	01.03.01.1	01.03.01.1	R1 OK	2	3	8.0 in	122.20 pcf	19.90 pcf	102.3 pcf	19.5%	100.0%	P		Rebtest Passed		
80	09/24/25	01.03.02.	01.03.02.		2	3	8.0 in	125.00 pcf	16.60 pcf	108.4 pcf	15.3%	104.0%	FAIL	Low MC			
81	09/24/25	01.03.02.1	01.03.02.1	R1 OK	2	3	8.0 in	124.70 pcf	17.50 pcf	107.2 pcf	16.3%	104.6%	P		Rebtest Passed		
82	09/24/25	01.03.03.	01.03.03.		2	3	8.0 in	114.70 pcf	20.20 pcf	94.5 pcf	21.4%	92.4%	FAIL	Low Dry Den	Rebtest Passed		
83	09/24/25	01.03.03.1	01.03.03.1	R1 OK	2	3	8.0 in	116.40 pcf	18.20 pcf	98.2 pcf	18.5%	96.0%	P				
84	09/24/25	01.03.04.	01.03.04.		2	3	8.0 in	118.00 pcf	20.30 pcf	97.7 pcf	20.8%	95.5%	P				
85	09/24/25	01.03.05.	01.03.05.		2	3	8.0 in	126.70 pcf	23.90 pcf	102.8 pcf	23.2%	100.5%	P				
86	09/24/25	01.03.06.	01.03.06.		2	3	8.0 in	127.10 pcf	22.70 pcf	104.4 pcf	21.7%	102.1%	P				
87	09/24/25	01.03.07.	01.03.07.		2	3	8.0 in	117.60 pcf	19.60 pcf	98.0 pcf	20.0%	95.8%	P				



Appendix C3

Shelby Tube Laboratory Reports

LABORATORY SERVICES REPORT

Report Number: 06251229.0003
Service Date: 09/12/25
Report Date: 09/19/25
Task: Laboratory Testing



2640 12th St SW
Cedar Rapids, IA 52404-3440
319-366-8321

Client

Steger Construction
Attn: Paul Steger
3297 Vine Rd
Dyersville, IA 52040-8714

Project

Climax Molybdenum Industrial Landfill Phase 4-6 Construction
2598 Highway 61
Fort Madison, IA 52627

Project Number: 06251229

As requested, a Terracon representative performed permeability testing on four (4) Shelby tube soil samples. The samples were delivered to our laboratory on September 11, 2025 by a representative with Steger Construction. The samples were tested in general accordance with ASTM 5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter. See test results below.

Services:

Terracon Rep.:

Reported To: NA
Contractor: Steger Construction

Report Distribution:

(1) Steger Construction, Paul Steger

Reviewed By:

Eric Puls
Department Manager I

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 16 METHOD C TEST WITH INCREASING TAILWATER LEVEL



PROJECT NAME: Climax Molybdenum Industrial Landfill				PROJECT NO.: 62551229				CITY, STATE: Fort Madison, IA			
SAMPLE ID: S-1				TEST DATE: 9/16/2025				PROJECT LOCATION: Fort Madison, IA			
DESCRIPTION: Sandy lean clay, trace gravel, brown				Cross Sectional Area: 0.852 cm ²							
LIQUID LIMIT:		PLASTIC LIMIT:		PERCENT FINES:							

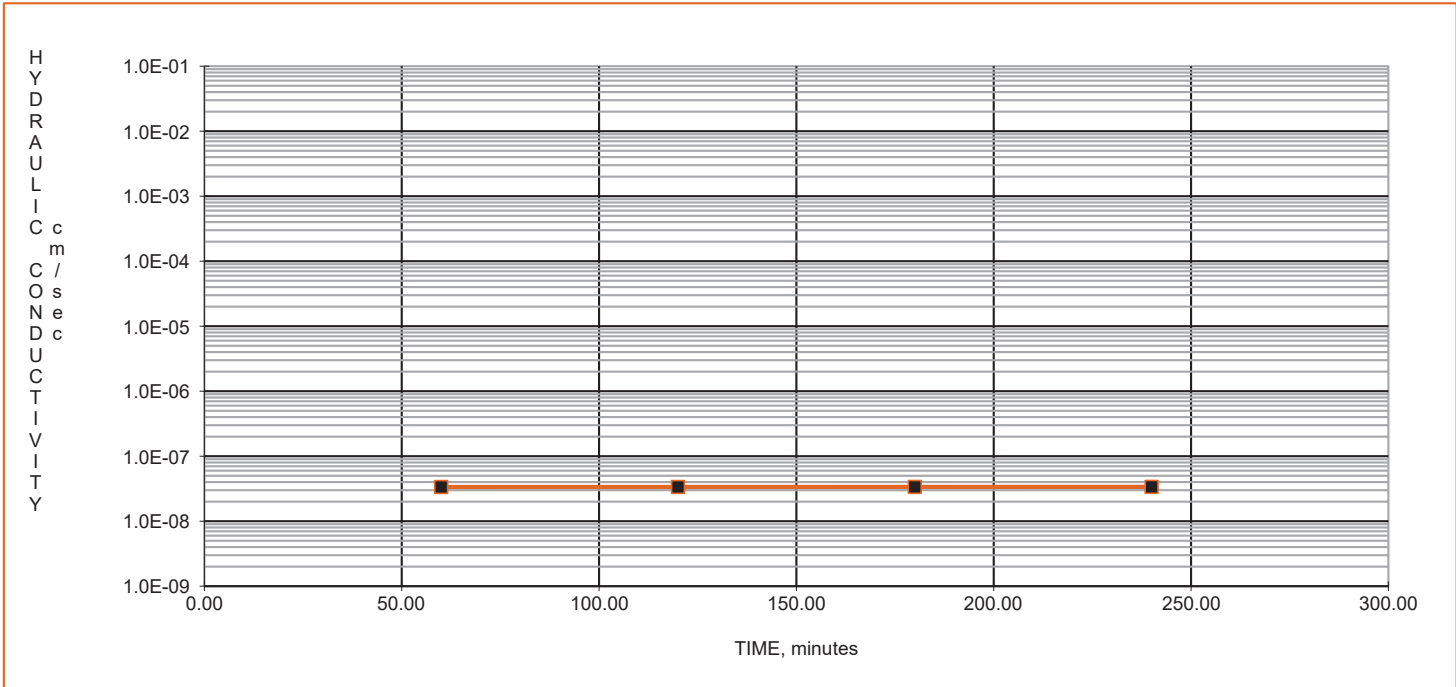
MOISTURE%		DENSITY									
WET + TARE, g:	107.51	WET WT, g:	673.1	SPEC GRAV (G _s):		2.75	REMOLD (Y/N):		N		
DRY + TARE, g:	97.17	DIA, in:	2.84	7	cm	ASSUMED G _s (Y/N):	Y	PROCTOR:		-	
TARE, g:	23.23	HT, in:	3.00	7.63	cm	POROSITY, %:	31.3	OPTIMUM:		-	
MOISTURE %:	14.0	AREA, in ² :	6.350	40.96	cm ²	SATURATION, %:	84.5	COMPACTION, %:		N/A	
		WET DENSITY:	134.5	PCF	VOID RATIO:		0.46	OVER OPTIMUM, %:		N/A	
		DRY DENSITY:	118.0	PCF							

SATURATION:		CHAMBER PRESS.: 40.0 psi		BACK PRESSURE (=UPPER=LOWER): 35.0 psi		B VALUE: 99%	
TEST:		CHAMBER PRESS.: 40.0 psi		UPPER: 35.0 psi		LOWER: 36.5 psi	
		EFFECT. CONSOL. STRESS: 5.0 psi		BIAS PRESSURE (=LOWER-UPPER)		1.5 psi	

ELAPSED		DELTA		OUT		IN							
Upper	Lower	TIME,	H	Ln	HYD CON	FLOW	FLOW	OUT/IN	HYD	% FROM	TEMP.:	TEMP.	
cm	cm	min	cm	H1/H2	k, cm/sec	cm ³	cm ³	RATIO	GRAD	MEAN k	C	CORR.:	
1.0	22.4		21.4										
1.1	22.3	60.00	21.2	0.001537	3.36E-08	0.1	0.1	1.00	16.6	0	20.5	0.992	
1.2	22.2	120.00	21.0	0.001539	3.37E-08	0.1	0.1	1.00	16.6	0	20.5	0.992	
1.3	22.1	180.00	20.8	0.001541	3.37E-08	0.1	0.1	1.00	16.6	0	20.5	0.992	
1.4	22.0	240.00	20.7	0.001544	3.38E-08	0.1	0.1	1.00	16.5	0	20.5	0.992	

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 3.4E-08 cm/sec** 0.001

FINAL MOISTURE%		FINAL DENSITY									
WET + TARE, g:	1087.10	WET WT, g:	679.1			SPEC GRAV (G _S):		2.70			
DRY + TARE, g:	989.00	DIA, in:	2.84	7	cm	ASSUMED G _S (Y/N):		Y			
TARE, g:	382.50	HT, in:	3.00	7.62	cm	POROSITY, %:		30.5			
MOISTURE %:	16.2	AREA, in ² :	6.335	40.87	cm ²	SATURATION, %:		99.6			
		WET DENSITY:	136.1	PCF			VOID RATIO:		0.44		
		DRY DENSITY:	117.2	PCF							



MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 16 METHOD C TEST WITH INCREASING TAILWATER LEVEL



PROJECT NAME: Climax Molybdenum Industrial Landfill				PROJECT NO.: 62551229				CITY, STATE: Fort Madison, IA			
SAMPLE ID: S-2				TEST DATE: 9/16/2025				PROJECT LOCATION: Fort Madison, IA			
DESCRIPTION: Sandy lean clay, trace gravel, brown								Cross Sectional Area:		0.852	cm ²
LIQUID LIMIT:		PLASTIC LIMIT:		PERCENT FINES:							

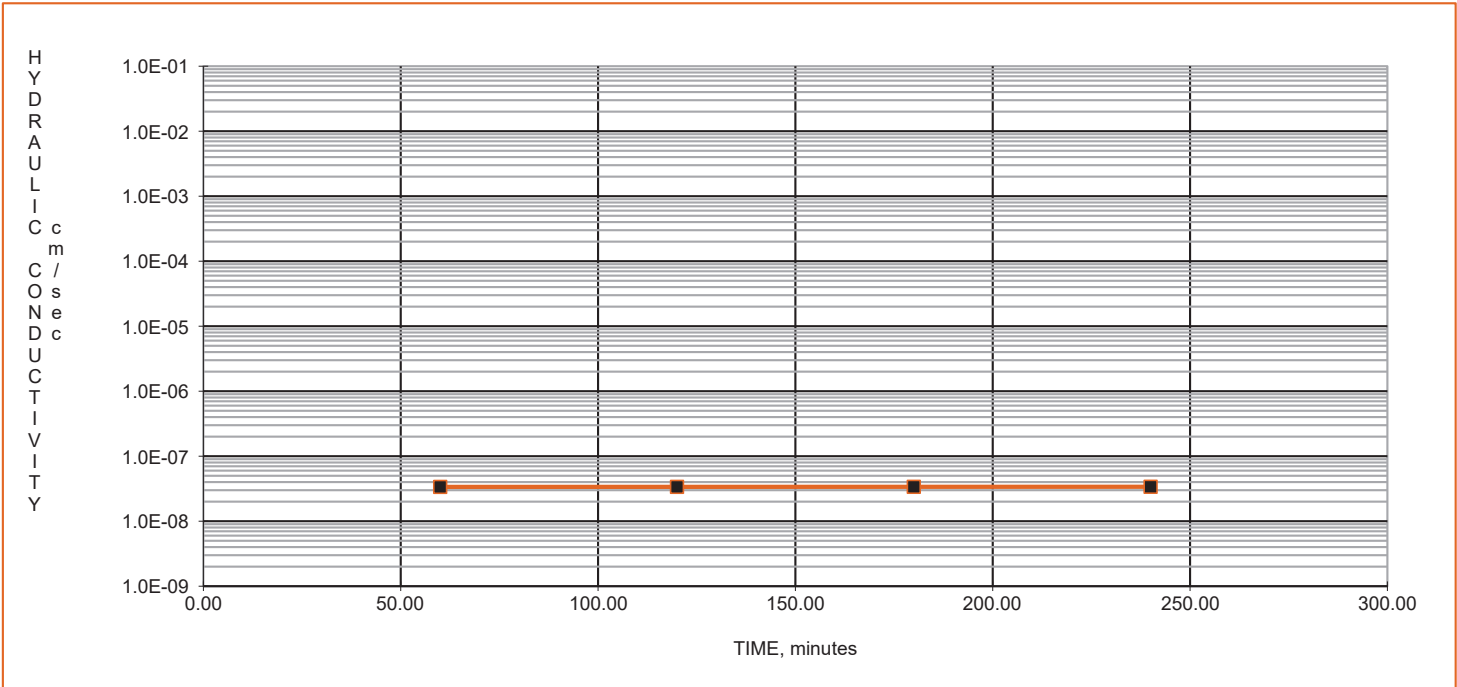
<u>MOISTURE%</u>		<u>DENSITY</u>									
WET + TARE, g:	87.25	WET WT, g:	655.7			SPEC 3 RAG ∇ s(:		2.)0	REMOLD W/N(:		N
DRY + TARE, g:	) 5.4)	DIA, in:	2.84	)	cm	ASSUMED 3 s W/N(:		Y	PROCTOR:		-
TARE, g:	27.96	HT, in:	7.00	) .62	cm	POROSITY, %:		72.1	OPTIMUM:		-
MOISTURE %:	15.1	AREA, in ² :	6.720	40.))	cm ²	SATURATION, %:		86.1	COMPACTION, %:		N/A
		WET DENSITY:	171.)	PCF			GOID RATIO:	0.4)	OGER OPTIMUM, %:		N/A
		DRY DENSITY:	114.4	PCF							

SATURATION:		CHAMBER PRESS.:		40.0	psi	BACK PRESSURE ∇ UPPER=LOWER(:		75.0	psi	B VALUE:		99%	
TEST:		CHAMBER PRESS.:		40.0	psi	UPPER:		75.0	psi	LOWER:		76.5	psi
		EFFECT. CONSOL. STRESS:		5.0	psi	BIAS PRESSURE ∇ LOWER-UPPER(		1.5	psi				

<u>ELAPSED</u>		<u>DELTA</u>				<u>OUT</u>		<u>IN</u>					
<u>Upper</u>	<u>Lower</u>	<u>TIME,</u>	<u>H</u>	<u>Ln</u>	<u>HYD CON</u>	<u>FLOW</u>	<u>FLOW</u>	<u>OUT/IN</u>	<u>HYD</u>	<u>% FROM</u>	<u>TEMP.:</u>	<u>TEMP.</u>	
cm	cm	min	cm	H1/H2	k, cm/sec	cm ³	cm ³	RATIO	GRAD	MEAN k	C	CORR.:	
1.0	22.4		21.4										
1.1	22.7	60.00	21.2	0.00157)	7.7)E-08	0.1	0.1	1.00	16.6	0	20.5	0.992	
1.2	22.2	120.00	21.0	0.001579	7.78E-08	0.1	0.1	1.00	16.6	0	20.5	0.992	
1.7	22.1	180.00	20.8	0.001541	7.78E-08	0.1	0.1	1.00	16.6	0	20.5	0.992	
1.4	22.0	240.00	20.)	0.001544	7.79E-08	0.1	0.1	1.00	16.5	0	20.5	0.992	

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 3.4E-08 cm/sec** 0.001

FINAL MOISTURE%		FINAL DENSITY		SPEC 3 RAG ∇s (:		2.)0
WET + TARE, g:	1058.00	WET WT, g:	6)6.4		ASSUMED s W/N(:	Y
DRY + TARE, g:	946.90	DIA, in:	2.8)	)	POROSITY, %:	74.0
TARE, g:	762.70	HT, in:	7.01	) .65	SATURATION, %:	99.5
MOISTURE %:	19.0	AREA, in ² :	6.469	41.)4	GOID RATIO:	0.52
		WET DENSITY:	172.7	PCF		
		DRY DENSITY:	111.2	PCF		



MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 16 METHOD C TEST WITH INCREASING TAILWATER LEVEL



PROJECT NAME: Climax Molybdenum Industrial Landfill	PROJECT NO.: 62551229	CITY, STATE: Fort Madison, IA
SAMPLE ID: S-/	TEST DATE: 9/16/25	PROJECT LOCATION: Fort Madison, IA
DESCRIPTION: Sandy lean to fat clay trace gravel, bro8 n	Cross Sectional Area: c.052 gm ²	
LIUWD LIMIT:	PLASTIC LIMIT:	PERCENT FINES:

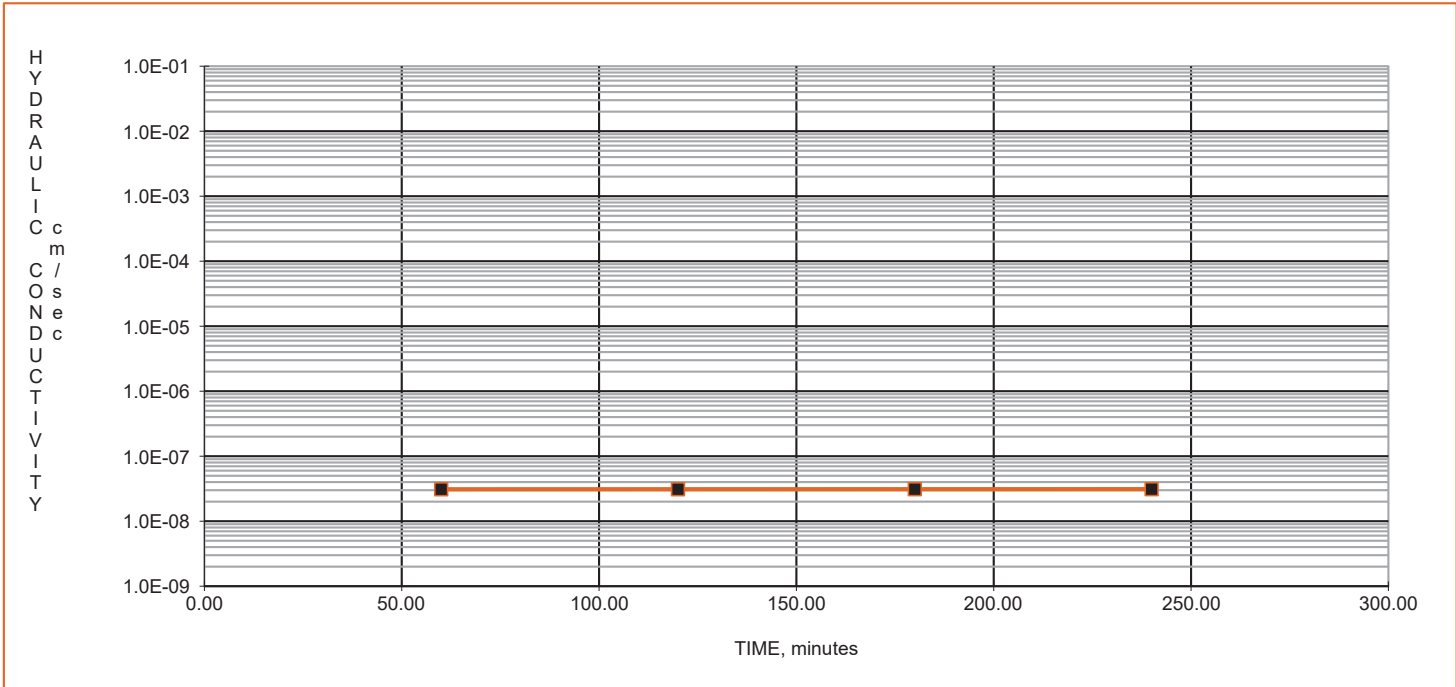
MOISTURE%		DENSITY									
+ ET 7 TARE, v:	113./ 1	+ ET + T, v:	G 2.2			SPEC VRA()V _s 4	2.G	REMOLD)Y0N4	N		
DRY 7 TARE, v:	99.53	DIA, in:	2.Q8	G	gm	ASSUMED V _s)Y0N4	Y	PROCTOR:	-		
TARE, v:	2/.16	HT, in:	/.5c	Q09	gm	POROSITY, %:	/ G/	OPTIMWM:	-		
MOISTWRE %:	19./	AREA, in ² :	6./ 2c	3c.GG	gm ²	SATWRATION, %:	QGG	COMPACTION, %:	N0A		
		+ ET DENSITY:	126.1	PCF		(OI0 RATIO:	c.6c	O(ER OPTIMWM, %:	N0A		
		DRY DENSITY:	1c5.G	PCF							

SATURATION:	CHAMBER PRESS.:	3c.c	psi	BACK PRESSWRE)=WPPER=LO+ ER4				/ 5.c	psi	B VALUE:	99%
TEST:	CHAMBER PRESS.:	3c.c	psi	WPPER:	/ 5.c	psi	LO+ ER:	/ Gc	psi		
	EFFECT. CONSOL. STRESS:	5.0	psi	BIAS PRESSWRE)=LO+ ER-WPPER4				2.c	psi		

ELAPSED		DELTA		OUT		IN							
Upper	Lower	TIME,	H	Ln	HYD CON	FLOW	FLOW	OUT/IN	HYD	% FROM	TEMP.:	TEMP.	
cm	cm	min	cm	H1/H2	k, cm/sec	cm ³	cm ³	RATIO	GRAD	MEAN k	C	CORR.:	
1.9	22.3		2c.5										
2.c	22./	6c.cc	2c./	c.cc121c	/ .1cE-cQ	c.1	c.1	1.cc	1Q1	c	2c.5	c.992	
2.1	22.2	12c.cc	2c.1	c.cc1212	/ .1cE-cQ	c.1	c.1	1.cc	1Q1	c	2c.5	c.992	
2.2	22.1	1Qc.cc	19.9	c.cc121/	/ .11E-cQ	c.1	c.1	1.cc	1Q1	c	2c.5	c.992	
2./	22.c	23c.cc	19.G	c.cc1215	/ .11E-cQ	c.1	c.1	1.cc	1Qc	c	2c.5	c.992	

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 3.1E-08 cm/sec** c.cc1

FINAL MOISTURE%		FINAL DENSITY									
+ ET 7 TARE, v:	11cc.5c	+ ET + T, v:	G2.5			SPEC VRA()V _s 4	2.G				
DRY 7 TARE, v:	9Q .2c	DIA, in:	2.Q8	G	gm	ASSUMED V _s)Y0N4	Y				
TARE, v:	/ G6.3c	HT, in:	/.5c	Q09	gm	POROSITY, %:	/ 3.5				
MOISTWRE %:	19./	AREA, in ² :	6./ G	31.16	gm ²	SATWRATION, %:	99.2				
		+ ET DENSITY:	1/ 1.Q	PCF		(OI0 RATIO:	c.5/				
		DRY DENSITY:	11c.5	PCF							



**MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS
USING A FLEXIBLE WALL PERMEAMETER
ASTM D 5084 - 16 METHOD C TEST WITH INCREASING TAILWATER LEVEL**



PROJECT NAME: Climax Molybdenum Industrial Landfill	PROJECT NO.: 62551229	CITY, STATE: Fort Madison, IA
SAMPLE ID: S-/	TEST DATE: 9/16/25	PROJECT LOCATION: Fort Madison, IA
DESCRIPTION: Sandy lean clay, trace gravel, broken		Cross Sectional Area: 0.052 m ²
LIQUID LIMIT: PLASTIC LIMIT:	PERCENT FINES:	

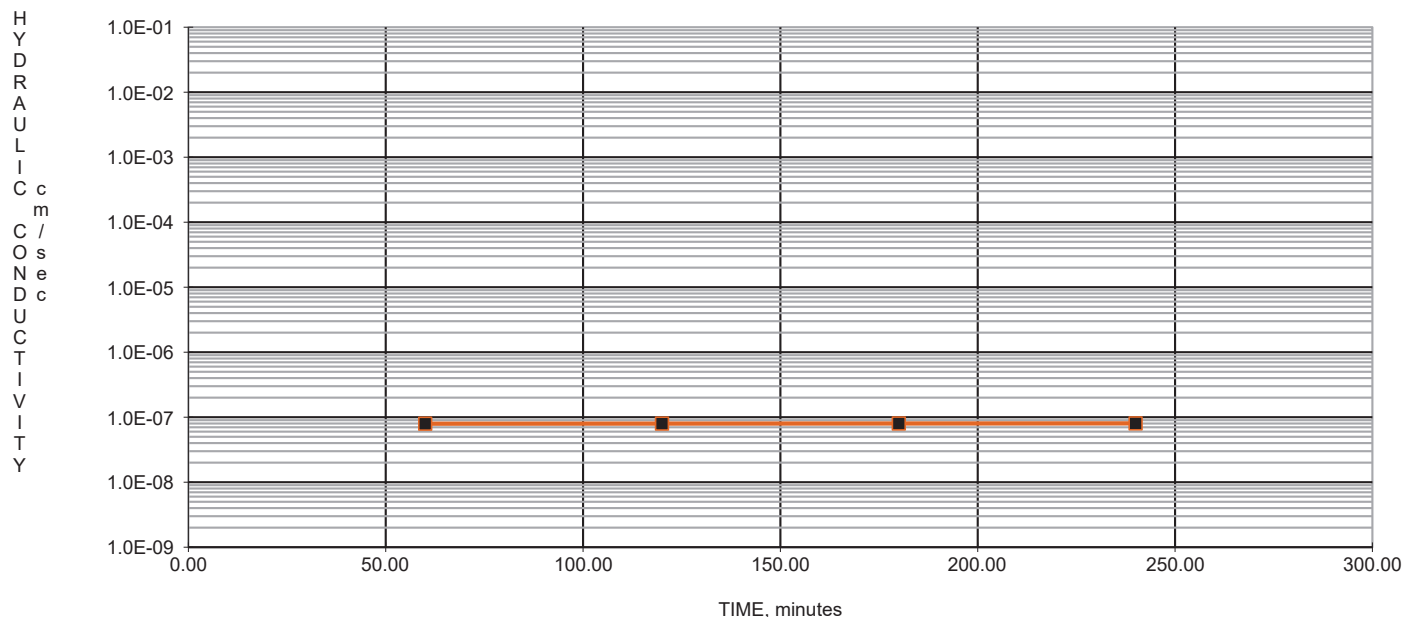
MOISTURE%				DENSITY							
+ ET 7 TARE, v:	100.06	+ ET + T, v:	669.3					SPEC GRAV (G _s):	2.40	REMOLD (Y _N):	N
DRY 7 TARE, v:	91.6/	DIA, in:	2.0	4	gm			ASSUMED G _s (Y _N):	Y	PROCTOR:	-
TARE, v:	2/ / 6	HT, in:	3.01	4.6/	gm			POROSITY, %:	29.3	OPTIMUM:	-
MOISTURE %:	12.5	AREA, in ² :	6.320	/ 0.44	gm ²			SATURATION, %:	0.0	COMPACTION, %:	N/A
		+ ET DENSITY:	13/ 2	PCF				VOID RATIO:	0.1	OVER OPTIMUM, %:	N/A
		DRY DENSITY:	119.2	PCF							

SATURATION:	CHAMBER PRESS.: / 0.0 psi	BACK PRESSURE (=WPPER=LO+ ER):	35.0 psi	B VALUE:	99%
TEST:	CHAMBER PRESS.: / 0.0 psi	WPPER:	35.0 psi	LO+ ER:	34.0 psi
	EFFECT. CONSOL. STRESS:	5.0 psi	BIAS PRESSURE (=LO+ ER-WPPER)	2.0 psi	

Upper	Lower	ELAPSED	DELTA			OUT	IN						
cm	cm	TIME,	H	L _n	HYD CON	FLOW	FLOW	OUT/IN	HYD	% FROM	TEMP.:	TEMP.	
		min	cm	H1/H2	k, cm/sec	cm ³	cm ³	RATIO	GRAD	MEAN k	°C	°C	CORR.:
1.0	22.1	60.00	21.1	0.003613	4.95E-08	0.2	0.2	1.00	21.1	1	20.5	20.5	0.992
1.3	21.0	120.00	20.3	0.003626	4.90E-08	0.2	0.2	1.00	21.1	0	20.5	20.5	0.992
1.6	21.5	180.00	19.4	0.0036/ 0	4.91E-08	0.2	0.2	1.00	21.0	0	20.5	20.5	0.992
2.1	21.2	240.00	19.1	0.003653	4.93E-08	0.2	0.2	1.00	20.9	1	20.5	20.5	0.992

HYDRAULIC CONDUCTIVITY (k) = **AVERAGE 8.0E-08 cm/sec** 0.003

FINAL MOISTURE%				FINAL DENSITY							
+ ET 7 TARE, v:	90.090	+ ET + T, v:	642.3					SPEC GRAV (G _s):	2.40		
DRY 7 TARE, v:	89.10	DIA, in:	2.0	4	gm			ASSUMED G _s (Y _N):	Y		
TARE, v:	206.90	HT, in:	3.05	4.45	gm			POROSITY, %:	33.2		
MOISTURE %:	10.5	AREA, in ² :	6.290	/ 0.50	gm ²			SATURATION, %:	100.0		
		+ ET DENSITY:	133.5	PCF				VOID RATIO:	0.50		
		DRY DENSITY:	112.6	PCF							





Appendix D

Geosynthetics Installation Documentation



Appendix D1

Geomembrane Material Inventory Results



PROJECT NUMBER: 25086

SALES ORDER: SO-098985

PACKING SLIP NUMBER: Pre-SO-098985-1

PROJECT NAME : CLIMAX MOLYBDENUM LF

ROLL NUMBER	RESIN LOT NUMBER	MANUFACT. DATE	RESIN MELT INDEX 190/2.16 g/10 min D1238	RESIN DENSITY g/cc D1505	OIT min D8117	HPOIT min D5885	ESCR SP-NCTL hours D5397
Product Code : 1101547							
<u>GSE HD 60mil/1.50mm G Black TEX</u>			1.0	> 0.932	100		500
0107-187011	D250420847	2025-07-05	0.09	0.937	203		>500 Certified 0107-186986
0107-187012	D250420847	2025-07-05	0.09	0.937	203		>500 Certified 0107-186986
0107-187013	D250420847	2025-07-05	0.09	0.937	203		>500 Certified 0107-186986
0107-187018	D250420847	2025-07-06	0.09	0.937	203		>500 Certified 0107-186986
0107-187020	D250420847	2025-07-06	0.09	0.937	203		>500 Certified 0107-186986
0107-187023	D250420847	2025-07-06	0.09	0.937	203		>500 Certified 0107-186986

QUANTITY (ROLLS): 6

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

Solmax Geosynthetics LLC
19103 GUNDLE RD., HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM



SOLMAX

MANUFACTURING QUALITY CONTROL



TEST RESULTS

PROJECT NUMBER: 25086

SALES ORDER: SO-098985

PACKING SLIP NUMBER: Pre-SO-098985-1

PROJECT NAME : CLIMAX MOLYBDENUM LF

PRODUCT: 1101547

GSE HD 60mil/1.50mm G Black TEX

Properties	Thickness ave/min.	GeoM Density	Carbon Black Content	Carbon Black Dispersion	Tensile				Tear Resist.	Puncture Resist.	Dimension Stability	Asperity Height In/Out
					Yield Strength	Elong.	Break Strength	Elong.				
Unit	mils	g/cc	%	Cat 1 and 2	ppi	%	ppi	%	lbs	lbs	%	mils
Test Method	D5994	D792	D4218	D5596	D6693				D1004	D4833	D1204	D7466
Frequency	Each roll	Every 10 rolls	Every 2 rolls	Every 10 rolls	Every 2 rolls				Every 5 rolls	Every 5 rolls		Every roll
Specification	57.0 / 51.0	≥ 0.940	2.0 - 3.0	Cat. 1 & Cat. 2	132	13	132	150	45	120		16 / 16
0107-187011 MD XD	61.2 / 57.2	0.946	2.59	10/10 views	156.9 164.0	17.4 17.1	213 209	568 593	55 59	144		20.1 / 20.4
0107-187012 MD XD	61.5 / 59.3	0.946	2.51	10/10 views	147.8 153.4	17.4 16.9	196 192	560 578	55 59	144		20.4 / 21.1
0107-187013 MD XD	61.0 / 58.3	0.946	2.51	10/10 views	147.8 153.4	17.4 16.9	196 192	560 578	50 52	137		21.0 / 20.1
0107-187018 MD XD	60.0 / 56.6	0.945	2.27	10/10 views	141.8 154.7	18.2 15.9	189 164	546 500	50 52	139		21.6 / 21.4
0107-187020 MD XD	58.3 / 55.5	0.945	2.27	10/10 views	134.9 148.9	18.6 16.6	188 176	537 529	50 52	139		22.7 / 21.4
0107-187023 MD XD	58.2 / 56.5	0.945	2.37	10/10 views	145.0 151.5	18.3 16.1	211 186	588 557	50 54	139		21.7 / 22.3

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

Solmax Geosynthetics LLC

19103 GUNDEL RD., HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM



Bayport Polymers LLC
12212 Port Road
Pasadena, TX 77507

ENRIQUE GARZA
HOUSTON 77073

SHIPPED TO:
SOLMAX GEOSYNTHETICS
19103 GUNDLE ROAD
WESTFIELD TX 77073

Material: Our / Your reference
MDPE 37120 (441840) /

Please find below test data and pertinent information on Bayport Polymers LLC.
Polyethylene material shipped to your plant.

Batch D250420847 **Quantity** 185,850 LB **Railcar** FUNX900841

Quality certificate

Date

06/04/2025

Purchase order item/date

615182-2 / 05/20/2025

Delivery item/date

88342915 000001 / 06/04/2025

Order item

33584744 000001

Customer number

81132745

Characteristic	Unit	Value
Density	g/cc	0.937
Melt Index 21.6/190	g/10 min	10.9
Railcar Prefix	-	FUNX
Railcar Number	-	900841
Melt Index 2.16/190	g/10 min	0.090

ENRIQUE GARZA
HOUSTON 77073

Delivery item/date	Page
88342915 000001 / 06/11/2025	2



Jeremy Gasper
Laboratory Superintendent
12212 Port Road, Pasadena, Texas 77507
P.O. Box 5010, LaPorte, Texas 77572-5010



Appendix D2

Geomembrane Panel Placement Records

GEOSYNTHETIC PANEL PLACEMENT RECORDSCS Engineers CQA Technician: Lena Sengphachanh

Client Name: Climax Molybdenum
 Project Location: 2749 Highway 27
Argyle, Iowa 52619

SCS Engineers Project Name: Phases 4-6
 SCS Engineers Project Number: 27224513.00

Date dd-mmm-yy	Time hhmm (24)	Panel Number	Roll Number	Panel Length (feet)	Panel Width (feet)	Panel Location/Comments (Tech #)
26-Sep-25	1025	1	0107-187023	134	22	West Leachate Trench
26-Sep-25	1050	2	0107-187023	132	22	West of P1
26-Sep-25	1115	3	0107-187023	131	22	West of P2
26-Sep-25	1330	4	0107-187012	135	22	West of P3
26-Sep-25	1345	5	0107-187012	136	22	West of P4
26-Sep-25	1357	6	0107-187012	135	22	West of P5
26-Sep-25	1430	7	0107-187012	82	22	West of P6
26-Sep-25	1455	8	0107-187023	41	12	West of P7
26-Sep-25	1651	9	0107-187011	138	22	East Leachate Trench
26-Sep-25	1710	10	0107-187011	136	22	East of P9
27-Sep-25	0755	11	0107-187011	136	22	East of P10
27-Sep-25	0835	12	0107-187013	138	22	East of P11
27-Sep-25	0900	13	0107-187013	139	22	East of P12
27-Sep-25	0922	14	0107-187013	64	22	NE Corner (East Slope)
27-Sep-25	0940	15	0107-187013	64	22	South of P14 (East Slope)
27-Sep-25	1000	16	0107-187013	65	22	South of P15 (East Slope)
27-Sep-25	1007	17	0107-187011	65	22	South of P16 (East Slope)
27-Sep-25	1100	18	0107-187018	64	22	South of P17 (East Slope)
27-Sep-25	1113	19	0107-187018	65	22	SE Corner (East Slope)
27-Sep-25	1135	20	0107-187018	136	22	East of P13
27-Sep-25	1624	21	0107-187018	131	22	West of P9
27-Sep-25	1645	22	0107-187018	129	22	West of P21
27-Sep-25	1715	23	0107-187020	131	22	West of P22
27-Sep-25	1731	24	0107-187020	131	22	Between P1 & P23



Appendix D3

Geomembrane Trial Weld Records

TRIAL WELD RECORD

Client Name: Climax Molybdenum

SCS Engineers Project Name: Phases 4-6

SCS Engineers Project Number: 27 224513.00

Project Location: 27 49 Highway 27
Argyle, Iowa 52619

SCS Engineers
CQA Technician:

Lena Sengphachanh

Specifications: 60 mil
Material Type: HDPE

	Fusion	Extrusion
Peel (P)	≥ 91 lb/in	≥ 78 lb/in
Shear (S)	≥ 120 lb/in	≥ 120 lb/in

Max # of Failing Tests Allowed per P/S Set: 0 ea

Trial Weld Number	Date dd-mm-yy	Time hhmm (24)	Ambient Temp (F°)	Installer QC	Seamers Initials	Machine Number	Machine Properties	Weld Type	Test Values (lbs/in)					Pass/ Fail	Material (Top 1st)	Comments	(Tech #)
									Coupon 1	Coupon 2	Coupon 3	Coupon 4	Coupon 5				
1	26-Sep-25	1240	84	GRC	BRM	290	860/600	Fusion	P 126 119 S 141	116 115 140	126 113 146	117 120 144	107 117 146	Pass	S/S		
2	26-Sep-25	1240	84	GRC	CP	363	860/600	Fusion	P 98 108 S 144	116 110 150	116 104 145	111 111 147	109 108 149	Pass	S/S		
3	26-Sep-25	1230	84	GRC	GRC	513	550/300	Extrusion	P 127 S 144	93 139	124 137	112 139	122 142	Pass	T/T		
4	26-Sep-25	1245	84	GRC	CP	363	860/450	Fusion	P 126 116 S 141	103 112 141	98 119 145	101 122 145	141 99 146	Pass	S/T		
5	26-Sep-25	1245	84	GRC	GRC	215	550/300	Extrusion	P 122 S 136	116 134 134	94 136 136	119 133 133	93 135 135	Pass	T/T		
6	27-Sep-25	0745	57	GRC	GR	363	860/600	Fusion	P 121 110 S 156	113 123 146	123 129 154	110 110 157	129 117 153	Pass	S/S		
7	27-Sep-25	0746	57	GRC	GR	363	860/450	Fusion	P 112 109 S 152	111 117 146	110 113 154	115 113 157	110 114 153	Pass	S/T		
8	27-Sep-25	0748	57	GRC	GR	363	860/450	Fusion	P 116 123 S 145	121 127 150	129 133 142	139 138 143	127 136 145	Pass	T/T		
9	27-Sep-25	0945	70	GRC	GRC	215	550/300	Extrusion	P 120 S 141	120 141	134 138	123 145	134 145	Pass	T/T		
10	27-Sep-25	1250	82	GRC	GR	363	860/600	Fusion	P 100 105 S 129	103 100 134	112 98 128	102 99 130	97 98 133	Pass	S/S		
11	27-Sep-25	1252	82	GRC	GR	363	860/450	Fusion	P 117 107 S 133	115 1098 135	99 103 133	119 111 130	109 107 131	Pass	S/T		
12	27-Sep-25	1246	82	GRC	GRC	215	550/300	Extrusion	P 120 S 127	125 130 130	89 153 153	116 155 155	130 142 142	Pass	T/T		
13	28-Sep-25	0840	64	GRC	GRC	215	550/300	Extrusion	P 106 S 145	99 143 143	106 139 139	109 147 147	109 140 140	Pass	T/T		



Appendix D4

Geomembrane Panel Seam Records



Appendix D5

Geomembrane Non-Destructive Test Records

ADDITIONAL NON-DESTRUCTIVE TEST RECORD

SCS Engineers CQA Technician: Lena Sengphachanh

Client Name: Climax Molybdenum
Project Location: 2749 Highway 27
Argyle, Iowa 52619

SCS Engineers Project Name: Phases 4-6

SCS Engineers Project Number: 27224513.00

Max Pressure Drop: 4.0 psi
Test Standard Elapsed Time: 5 min

Test Number	Test Date dd-mm-yy	Seam Number			Tester Initials	Pressure			Time (hhmm 0 to 24 hr)		Pressure Test P/F	Vacuum Box P/F	Location/Comments	(Tech #)
						Start	End	+/-	Start	End				
1	28-Sep-25	13	20		JF	30 psi	30 psi	0 psi	0824	0829	Pass		Retest at 0-60' N	
2	28-Sep-25	13	20		JF	30 psi	30 psi	0 psi	0823	0828	Pass		Retest 64'-EOS	



Appendix D6

Geomembrane Field Destructive Test Records

DESTRUCTIVE TEST RECORD

Client Name: Climax Molybdenum

SCS Engineers Project Name: Phases 4-6

SCS Engineers Project Number: 27224513.00

SCS Engineers Project Location: 27 49 Highway 27
Argyle, Iowa 52619

Specifications: 60 mil

Material Type: HDPE

Peel (P) ≥ 91

Shear (S) ≥ 120

Extrusion ≥ 78

lb/in

lb/in

SCS Engineers CQA Technician: Lena Sengphachanh

Number of Passing Tests: 5 Tests

Number of Failing Tests Allowed per P/S Set: 0 ea

Max # of Failing Tests Allowed per P/S Set: 0 ea

See on Trial Weld Worksheet

Min Req'd Destruct Tests

1 Tests

#VALUE!

Net # of Test above Req'd

#VALUE!

Sample ID	Date dd-mm-yy	Time hh:mm (24)	Installer's QC	Seam Number	Seamers Initials	Machine Number	Weld Type	Field Test Values (lbs/in)					Field Pass/Fail	Lab Pass/Fail	Repair Number	Location	(Tech #)
								Coupon 1	Coupon 2	Coupon 3	Coupon 4	Coupon 5					
DS-1	26-Sep-25	1515	GRC	7 6	CP	363	Fusion	P 117 S 131	97 101 115 130	102 139	99 118	106 96	Pass		R-6		
DS-2	27-Sep-25	1425	GRC	9 10	CP	363	Fusion	P 106 S 130	99 104 128	103 113 127	105 114 130	107 104 128	Pass		R-12		
DS-X1	27-Sep-25	1409	GRC	9 10	GRC	215	Extrusion	P 126 S 135	126 131 135	126 135	124 137	124 126	Pass		R-14		
DS-3	27-Sep-25	1534	GRC	13 20	GR	363	Fusion	P 111 S 127	96 110 112 127	97 98 132	104 101 128	99 114 132	Pass		R-15		
DS-4	28-Sep-25	0935	GRC	23 24	GR	363	Fusion	P 122 S 142	107 113 151	104 106 142	108 107 142	115 113 140	Pass		R-34	@ 109' N	



Appendix D7

Laboratory Geomembrane Destructive Test Records



Date: 2025-10-01

Mail To:

Matt Sondrol

Clean Air and Water Systems (seams)

1323 Poplar Drive

Waukesha , Wi , 53118

Bill To:

Clean Air and Water Systems (seams)

e-mail:

msondrol@caawsystems.com gcassett@caawsystems.com lkrabel@caawsystems.com

Dear Mr. Sondrol,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:

Climax Molybdenum Industrial LF Ph 4-6 25086

TRI Job Reference Number:

84218

Material(s) Tested:

(4) Heat Fusion Weld Seam(s)

(1) Single Extrusion Weld Seam(s)

Test(s) Requested:

SAME DAY Peel and Shear

(ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:

AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

sigfile

geolab

Geosynthetic Services Division

<http://www.geosyntheticstestinc.com>



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Clean Air and Water Systems (seams)

Project: Climax Molybdenum Industrial LF Ph 4-6 25086

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 84218

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DS-1 Weld: Heat Fusion						
Side: A						Peel A
Peel Strength (ppi)	105	136	109	142	116	122
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						Peel B
Peel Strength (ppi)	117	147	128	137	151	136
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	164	171	166	167	171	168
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-2 Weld: Heat Fusion						
Side: A						Peel A
Peel Strength (ppi)	115	120	122	115	120	118
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						Peel B
Peel Strength (ppi)	109	125	138	116	125	123
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	161	162	161	163	165	162
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

TRI ENVIRONMENTAL, INC.

9063 BEE CAVES RD. - AUSTIN, TX 78733 - USA | PH: 800.880.TEST OR 512.263.2101



DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Clean Air and Water Systems (seams)

Project: Climax Molybdenum Industrial LF Ph 4-6 25086

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 84218

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DS-3 Weld: Heat Fusion						
Side: A						Peel A
Peel Strength (ppi)	126	120	123	120	114	121
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						Peel B
Peel Strength (ppi)	129	129	125	116	105	121
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	162	160	161	165	161	162
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DS-4 Weld: Heat Fusion						
Side: A						Peel A
Peel Strength (ppi)	126	126	124	126	128	126
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						Peel B
Peel Strength (ppi)	123	117	111	123	119	119
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	163	161	162	167	163	163
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

TRI ENVIRONMENTAL, INC.

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK

TRI Client: Clean Air and Water Systems (seams)

Project: Climax Molybdenum Industrial LF Ph 4-6 25086

Material: 60 mil. HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

TRI Log#: 84218

PARAMETER	TEST REPLICATE NUMBER					MEAN
	1	2	3	4	5	
Sample ID: DSX-1 Weld: Single Extrusion						
Side: Peel						Peel
Peel Strength (ppi)	149	105	101	108	114	115
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						Shear
Shear Strength (ppi)	162	160	161	165	169	163
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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Appendix D8

Geomembrane Repair Records

REPAIR RECORD

Client Name: Climax Molybdenum

Project Location: 27 49 Highway 27

Argyle, Iowa 52619

Phases 4-6

SCS Engineers Project Name:

SCS Engineers Project Number: 27224513.00

SCS Engineers CQA Technician: Lena Sengphachanh

Date of Interest
enter mm-dd-yy

Note if blank
will consider
all dates.

"x" indicates criteria applies to this project

Population:
Destruct Test Frequency (1 per)

Number of Required Destructs

x			
Total Seam	Machine	Welder	
750 ft	750 ft	750 ft	

1 ea1 ea0 ea

Minimum # of Destructs Required

For Project Period

Repair Number	Panel/Seam	Repaire Initials	Machine Number	Repair Type	Repair size Length (ft)	Width (ft)	Trial Weld Number	Test Date dd-mm-yy	Tester Initials	Test P/F	Location/Comments (Tech #)	Time hhmm (24)
R-1	1	GRC	215	Patch	8.0 ft	x 2.0 ft	5	26-Sep-25	LJ	Pass	Pipe Boot - 41' S, 12' E from SOS	
R-2	1	GRC	215	Patch	9.0 ft	x 2.0 ft	5	26-Sep-25	LJ	Pass	Pipe Boot - 105' S, 14' E from SOS	
R-3	1 2	GRC	215	Patch	11.0 ft	x 2.0 ft	5	26-Sep-25	LJ	Pass	98' South	
R-4	1 2	GRC	215	Patch	10.0 ft	x 2.0 ft	5	26-Sep-25	LJ	Pass	43' South	
R-5	2 3	GRC	215	Patch	5.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	33' South	
R-6	6 7	GRC	215	Patch	5.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	54' South, DS-1	
R-7	7 8	GRC	215	Patch	2.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	49' South	
R-8	9	GRC	215	Patch	5.0 ft	x 2.0 ft	5	26-Sep-25	LJ	Pass	Pipe Boot - 96' N, 13' W	
R-9	9	GRC	215	Patch	5.0 ft	x 2.0 ft	9	27-Sep-25	LJ	Pass	Pipe Boot - 29' N, 10' W	
R-10	9 10	GRC	215	Patch	10.0 ft	x 2.0 ft	9	27-Sep-25	LJ	Pass	28' N', Connects R9	
R-11	9	GRC	215	Patch	2.0 ft	x 1.0 ft	9	27-Sep-25	LJ	Pass	31' N, 7' E, Wrinkle	
R-12	9 10	GRC	215	Patch	6.0 ft	x 2.0 ft	9	27-Sep-25	LJ	Pass	92' N, DS-2	
R-13	9 R12 10	GRC	215	Patch	8.0 ft	x 2.0 ft	9	27-Sep-25	LJ	Pass	94' N 8' W	
R-14	9 R10 10	GRC	215	Patch	6.0 ft	x 2.0 ft	9	27-Sep-25	LJ	Pass	DS-X1	
R-15	13 20	GRC	215	Patch	5.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	62' N, DS-3	
R-16	14 20	GRC	215	Patch	3.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	Crest of North Anchor Trench	
R-17	14 15 20	GRC	215	Patch	2.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	T-Joint	
R-18	15 16 20	GRC	215	Patch	2.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	T-Joint	
R-19	16 17 20	GRC	215	Patch	2.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	T-Joint	
R-20	17 18 20	GRC	215	Patch	2.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	T-Joint	
R-21	18 19 20	GRC	215	Patch	2.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	T-Joint	
R-22	19 20	GRC	215	Patch	5.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	Cap	
R-23	16 17	GRC	215	Patch	2.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	Crest of East Anchor Trench	
R-24	18 19	GRC	215	Patch	3.0 ft	x 2.0 ft	12	27-Sep-25	LJ	Pass	Crest of East Anchor Trench	
R-25	10 11	GRC	215	Patch	2.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	Crest of North Anchor Trench	
R-26	9 21	GRC	215	Patch	5.0 ft	x 4.0 ft	13	28-Sep-25	LJ	Pass	Wrinkle	
R-27	9 21	GRC	215	Patch	2.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	103' S	
R-28	22 23	GRC	215	Patch	2.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	Crest of North Anchor Trench	
R-29	23	GRC	215	Patch	2.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	109' N, 8' W	
R-30	23	GRC	215	Patch	2.0 ft	x 2.0 ft	13	28-Sep-25	LJ	Pass	115' N, 8' W	

REPAIR RECORD

Client Name: Climax Molybdenum

Project Location: 27 49 Highway 27

Argyle, Iowa 52619

Phases 4-6

SCS Engineers Project Name:

SCS Engineers Project Number: 27224513.00

SCS Engineers CQA Technician: Lena Sengphachanh

Date of Interest

enter mm-dd-yy

Note if blank will consider all dates.

"x" indicates criteria applies to this project

Population:

Destruct Test Frequency (1 per)

Number of Required Destructs

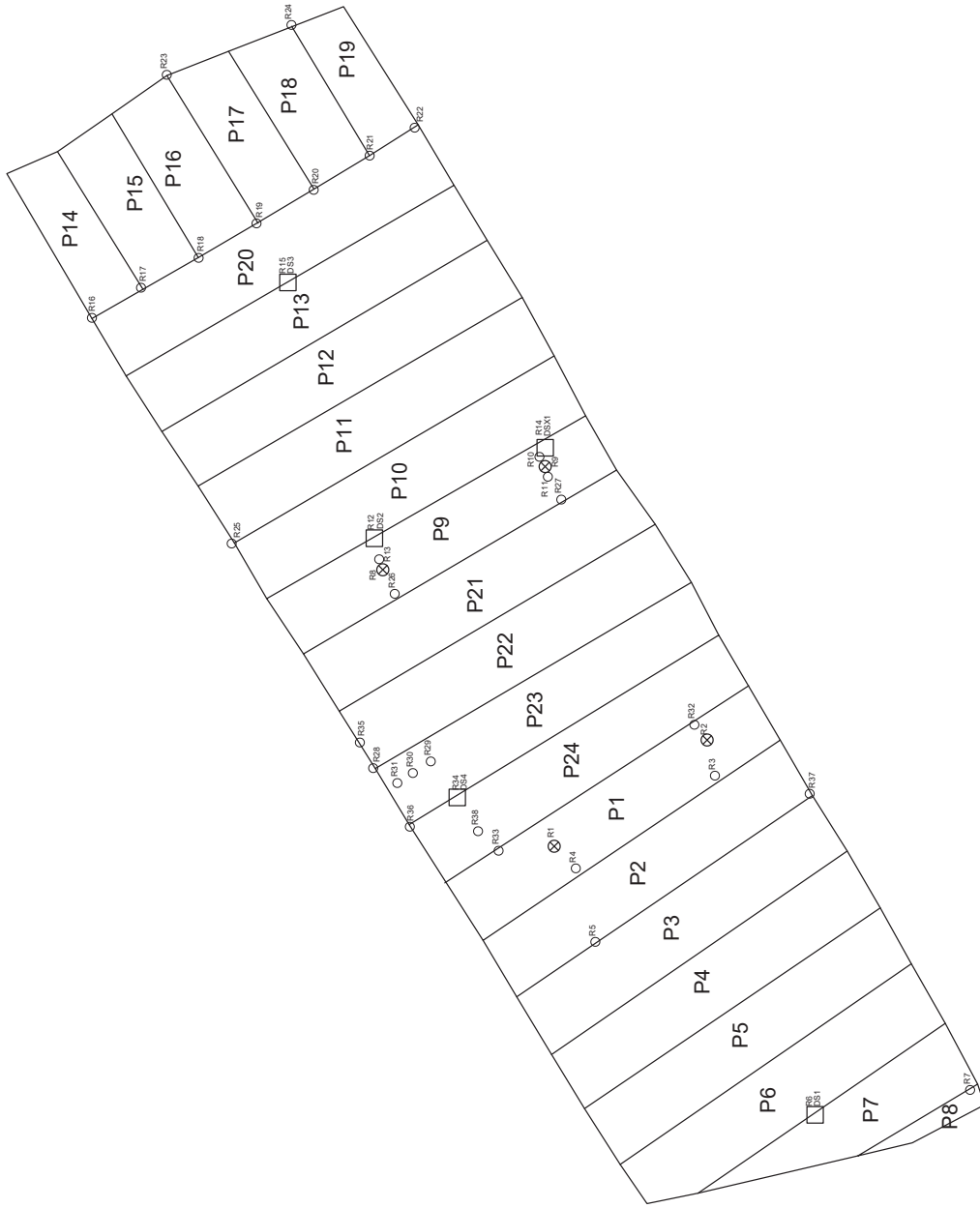
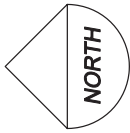
x				all dates.
Total Seam	Machine	Welder		
750 ft	750 ft	750 ft		
1 ea	1 ea	0 ea		
Minimum # of Destructs Required				1 ea

Repair Number	Panel/Seam	Repairer Initials	Machine Number	Repair Type	Repair size Length (ft)	Width (ft)	Trial Weld Number	Test Date dd-mm-yy	Tester Initials	Test P/F	Location/Comments (Tech #)	Time hhmm (24)
R-31	23	GRC	215	Patch	2.0 ft	x	13	28-Sep-25	LJ	Pass	123' N 8' W	
R-32	24	GRC	215	Patch	2.0 ft	x	13	28-Sep-25	LJ	Pass	26' N	
R-33	1	GRC	215	Patch	4.0 ft	x	13	28-Sep-25	LJ	Pass	104' N	
R-34	23	GRC	215	Patch	5.0 ft	x	13	28-Sep-25	LJ	Pass	DS-4 @ 109' N	
R-35	22	GRC	215	Patch	20.0 ft	x	13	28-Sep-25	LJ	Pass	Panel extension in anchor trench	
R-36	23	GRC	215	Patch	9.0 ft	x	13	28-Sep-25	LJ	Pass	Air Test, No Lap @ 120' - EOS	
R-37	2	GRC	215	Patch	3.0 ft	x	13	28-Sep-25	LJ	Pass	Air Test Tab @ Crest of Anchor Trench	



Appendix D9

Geomembrane Panel Map



LEGEND

- R## REPAIR - PATCH
- DS# DESTRUCTIVE TEST
- P### PANEL NUMBER
- R## REPAIR - CAP
- ⊗ PIPE BOOT
- PANEL EDGE / FIELD SEAM



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Appendix E

Leachate Collection System Test Results



Appendix E1

Leachate Drainage Material Gradation Reports

PERMEABILITY TEST REPORT**ASTM D 2434-68(2006)**PROJECT No. **25-2044 (2252)**PROJECT **Ideal Permeability Testing**
CLIENT **Ideal Ready Mix**LOCATION
DATE **8/20/2025**SAMPLE **Poorly Graded Sand (SP), Light Brown, Fine to Medium**
DESCRIPTIONBORING NO. SAMPLE NO. **Sample #2**SAMPLE TYPE **Bulk** DEPTHSPECIFIC GRAVITY, G_s TEST METHOD **ASTM D 2434**

Q	L	A	Δt	h	k	k ₂₀
2409	19.45	102.43	60	111.13	6.86E-02	6.21E-02
2340	19.45	102.43	60	111.13	6.66E-02	6.04E-02
2385	19.45	102.43	60	111.13	6.79E-02	6.15E-02
2441	19.45	102.43	60	111.13	6.95E-02	6.30E-02
						6.17E-02

COEFFICIENT OF VERTICAL PERMEABILITY**K₂₀ = 6.17 E-02 CM/SEC**REMARKS: **Received 8/15/2025**TESTED
BY: **DJS**COMPUTED
BY: **DJS****GEOTECHNICS**
Soil & Material Testing4510 Paris Gravel Road
Hannibal, MO 63401
573-221-7714 Fax 573-221-7762

PERMEABILITY TEST REPORT**ASTM D 2434-68(2006)**PROJECT No. **25-1044 (2252)**PROJECT **Ideal Permeability Testing**
CLIENT **Ideal Ready Mix**LOCATION
DATE **8/21/2025**SAMPLE **Poorly Graded Sand (SP), Light Brown, Fine to Medium**
DESCRIPTIONBORING NO. SAMPLE NO. **Sample #1**SAMPLE TYPE **Bulk** DEPTHSPECIFIC GRAVITY, G_s TEST METHOD **ASTM D 2434**

Q	L	A	Δt	h	k	k ₂₀
2350	19.73	102.43	60	111.5	6.77E-02	6.16E-02
2514	19.73	102.43	60	111.5	7.24E-02	6.59E-02
2547	19.73	102.43	60	111.5	7.33E-02	6.67E-02
2676	19.73	102.43	60	111.5	7.70E-02	7.01E-02
2692	19.73	102.43	60	111.5	7.75E-02	7.05E-02
						<u>6.70E-02</u>

COEFFICIENT OF VERTICAL PERMEABILITY**K₂₀= 6.70 E-02 CM/SEC**REMARKS: **Received 8/15/2025**TESTED
BY: **DJS**COMPUTED
BY: **DJS****GEOTECHNICS**
Soil & Material Testing4510 Paris Gravel Road
Hannibal, MO 63401
573-221-7714 Fax 573-221-7762

Proj. No.:

IDEAL SAND River Rock 08/13/25				COARSE SAMPLE			
Sample ID:	3,556.0	Enter Grad # on Proj Info lab	100.0 %	Sieve Accuracy=	% Retd.	% Pass	% Final Specs
Orig. Dry Weight:	0.0				0.0	100.0	100
1.5" (37.5mm) Sieve	1,103.4	Sieve Type=	12		31.1	68.9	69
1" (25mm) Sieve	1,388.2				39.1	29.8	30
3/4" (19mm) Sieve	887.2				24.9	4.9	4.9
1/2" (12.5mm) Sieve	51.0				1.4	3.5	3.5
3/8" (9.5mm) Sieve	73.6				2.1	1.4	1.4
#4 (4.75mm) Sieve	7.0				0.2	1.2	1.2
#8 (2.36mm) Sieve	44.4				1.2		
Pan					100.0		
Orig. Dry Weight:	3,506.2					#200	1.8 0.25
Dry Wt. Washed:	3,455.8						
Pan	12.6						
Wash Loss	50.4						
Total	63.0						
Complies (Y/N)	Y						

INTERMEDIATE SAMPLE			
Sample ID:		Sieve Accuracy=	0.0 %
Orig. Dry Weight:			
1.5" (37.5mm) Sieve			0.1 0.0 0
1" (25mm) Sieve			0.1 0.0 0
3/4" (19mm) Sieve			0.1 0.0 0
1/2" (12.5mm) Sieve			0.1 0.0 0
3/8" (9.5mm) Sieve			0.1 0.0 0
#4 (4.75mm) Sieve			0.1 0.0 0
#8 (2.36mm) Sieve			0.1 0.0 0
Pan			0.1
Orig. Dry Weight:			0.8
Dry Wt. Washed:			#200 0.0 N/A
Pan			
Wash Loss	0.0		
Total	0.0		
Complies (Y/N)	Y		

FINE SAMPLE			
Sample ID:		Sieve Accuracy=	0.0 %
Orig. Dry Weight:			
Dry Wt. Washed:			
1/2" (12.5mm) Sieve			0.1 0.0 0
3/8" (9.5mm) Sieve			0.1 0.0 0
#4 (4.75mm) Sieve			0.1 0.0 0
#8 (2.36mm) Sieve			0.1 0.0 0
#16 (1.18mm) Sieve			0.1 0.0 0
#30 (600 µm) Sieve			0.1 0.0 0
#50 (300 µm) Sieve			0.1 0.0 0
#100 (150 µm) Sieve			0.1 0.0 0
#200 (75 µm) Sieve			0.1 0.0 0
Pan			0.1
Wash	0.0		1.0
Complies (Y/N)	Y		

Test 1

Form 820180

Lab. No.:		
Material:	sand	Grad. No.: 1
Co. & Proj. #:		
Producer:	ideal sand	
Contractor:		
Sampled By:	J HORNER	8/13/2025
Sample Loc.:	WAYLAND SAND	

Original Dry Weight:	520.4	Total Minus No. 4 (W1):	
Dry Weight Washed:	519.6	Reduced Minus No. 4 (W2)	
Washing Loss:	0.8	Conversion Factor: W1 / W2	
Calculated Weight (A) = Conversion Factor X (B)			

Sieve Size	Reduced Minus No. 4	Total or Calc. Weight Retd.	% Retained	% Passing	Grad. No.	
					State	Comm
1 1/2"						
1"						
3/4"						
1/2"						
3/8"		0.0				
No. 4		0.0	0.0	100.0	90-100	95-100
No. 8	(B)	2.2 (A)	0.4	99.6	70-100	80-100
No. 16	(B)	17.0 (A)	3.3	96.3	80	50-85
No. 30	(B)	123.0 (A)	23.6 (23.7)	72.6	10-60	25-60
No. 50	(B)	278.0 (A)	53.4 (53.5)	19.1		10-30
No. 100	(B)	91.0 (A)	17.5	1.6		2-10
No. 200	(B)	7.4 (A)	1.4	0.2	0-1.5	
Washing Loss		0.8	0.2			
Pan	(B)	0.4 (A)				
Total			99.8 (100.0)			
Accuracy Check						

#4	0.0	0.0
#8	0.4	0.4
#16	3.3	3.7
#30	23.7	27.4
#50	53.5	80.5
#100	17.5	98.0
Total Cumulative Percent =		210
Fineness Modulus =		2.10

2.80-3.25

Test 2

Form 820180

Lab. No.:		
Material:	sand	Grad. No.: 1
Co. & Proj. #:		
Producer:	ideal sand	
Contractor:		
Sampled By:	J HORNER	8/13/2025
Sample Loc.:	WAYLAND SAND	

Original Dry Weight:	527.8	Total Minus No. 4 (W1):	
Dry Weight Washed:	527.0	Reduced Minus No. 4 (W2)	
Washing Loss:	0.8	Conversion Factor: W1 / W2	
		Calculated Weight (A) = Conversion Factor X (B)	

Sieve Size	Reduced Minus No. 4	Total or Calc. Weight Retd.	% Retained	% Passing	Grad. No.	
					State	Comm
1½"						
1"						
¾"						
½"						
⅜"		0.0				
No. 4		0.0	0.0	100.0	90-100	95-100
No. 8	(B)	3.0 (A)	0.6	99.4	70-100	80-100
No. 16	(B)	17.4 (A)	3.3	96.1	80	50-85
No. 30	(B)	122.4 (A)	23.2 (23.1)	73.0	10-60	25-60
No. 50	(B)	279.2 (A)	52.9 (52.8)	20.2		10-30
No. 100	(B)	97.0 (A)	18.4	1.8		2-10
No. 200	(B)	7.8 (A)	1.5	0.3	0-1.5	
Washing Loss		0.8	0.3			
Pan	(B)	0.6 (A)				
Total			100.2 (100.0)			
Accuracy Check						

#4	0.0	0.0
#8	0.6	0.6
#16	3.3	3.9
#30	23.1	27.0
#50	52.9	79.9
#100	18.4	98.3
Total Cumulative Percent =		209.7
Fineness Modulus =		2.10 2.80-3.25



Appendix E2

Leachate Drainage Material Permeability Reports

PERMEABILITY TEST REPORT**ASTM D 2434-68(2006)**PROJECT No. **25-2044 (2252)**PROJECT **Ideal Permeability Testing**
CLIENT **Ideal Ready Mix**LOCATION
DATE **09/08/2025**SAMPLE DESCRIPTION **Poorly Graded Gravel (GP), Yellow Brown/Light Brown (River Rock)**

BORING NO.

SAMPLE NO. **Sample #3**SAMPLE TYPE **Bulk**

DEPTH

SPECIFIC GRAVITY, G_sTEST METHOD **ASTM D 2434**

Q	L	A	Δt	h	k	k ₂₀
2517	19.43	102.43	45	88.5	1.20E-01	1.15E-01
2434	19.43	102.43	45	88.5	1.16E-01	1.11E-01
2491	19.43	102.43	45	88.5	1.19E-01	1.14E-01
2435	19.43	102.43	45	88.5	1.16E-01	1.11E-01
						1.13E-01

COEFFICIENT OF VERTICAL PERMEABILITY**K₂₀ = 1.13 E-01 CM/SEC**REMARKS: **Received 09/04/2025**TESTED
BY: **DJS**COMPUTED
BY: **DJS****GEOTECHNICS**
Soil & Material Testing4510 Paris Gravel Road
Hannibal, MO 63401
573-221-7714 Fax 573-221-7762



Appendix F

Daily Field Activities Reports

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 8, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	8:00
SCS Engineers Project No:	27224513.00	Stop Time:	18:30
Project Location:	Climax Molybdenum Industrial Landfill Fort Madison, Iowa		

Weather Information

AM: 55 F, Mostly Cloudy, Wind 10-15 SSW
PM: 75 F, Clear, Wind 10-15 SSE

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (8)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

NE end of Phase 4-6 cell.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuclear Density Gauge, Standard Counts documented in Compaction Spreadsheet and field book.

Tests Completed/Observed

Subgrade has been proof rolled before arrival. Klingner to survey points. Density/Moisture tests performed on first lift at east end of cell.

Work Comments/Observations and Timeline of Notable Events

0800 - Arrive on site. Begin JSA tailgate meeting with Steger crew.
0830 - Tour site with Kevin and Mandy.
0930 - Klingner arrive on site to begin surveying. Klingner has troubles with controls points.
1430 - Klingner begins surveying points in cell. Steger begins watering subgrade at the east end of the cell starting at the north end to previous cell.
1530 - First load of soil from the borrow area was discarded at the NE slope of the cell.
1600 - Begin density testing at the NE slope after compaction.
1630 - Continue to install first lift in grid 1 of cell with same procedure of operations.
1730 - Steger ask to recalibrate/check standard count. Resume density testing on floor of grid 1 of cell.
1630 - SCS and Steger left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 9, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	9:30
SCS Engineers Project No:	27224513.00	Stop Time:	19:30
Project Location:	Climax Molybdenum Industrial Landfill Fort Madison, Iowa		

Weather Information

AM: 64 F, Clear, Wind 10-15 SSW
PM: 77 F, Clear, Wind 5-10 SSW-SSE

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (8)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

NE end of Phase 4-6 cell.
Relocate to West end of cell.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuclear Density Gauge, Standard Counts documented in Compaction Spreadsheet and field book.

Tests Completed/Observed

Nuke density tests in grid 1. Steger rework clay liner in grid 1 after failed tests.

Work Comments/Observations and Timeline of Notable Events

0930 - Arrive on site. JSA tailgate meeting with Steger crew.
1030 - Begins discing first lift in grid 1, east end of the cell.
1200 - Perform density testing after discing, watering and compacting lift. Use loaded haul truck to compact the south end of grid 1. Perform more density tests and failed.
1230 - On standby to figure solutions for failed tests.
1300 - HDPE pipe were delivered on site.
1400 - Perform density tests at borrow pit. Collect sample 1 in one area of borrow pit within 2' - 10' depth.
1500 - Continue testing borrow pit until found passing results in one location.
1600 - Steger begins relocating stockpiled soil on the north end of the borrow pit to excavate for passing material to use. Pipe fusion begins.
1730 - Passing material from borrow pit are transporting by haul truck to the west end of the cell and to be installed as first lift.
1830 - After first lift installation, perform density testing in grid 5 of the cell with one or two passing tests and more failing. Steger begins to shut down for the day.
1900 - SCS and Steger left site.

Material(s) Delivered to Site

HDPE Pipes

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 10, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	7:00
SCS Engineers Project No:	27224513.00	Stop Time:	19:00
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 55 F, Clear, Wind 0-5 S-N
PM: 84 F, Clear, Wind 0-5 S

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (8)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

West end of cell

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuclear Density Gauge, Standard Counts documented in Compaction Spreadsheet and field book.

Tests Completed/Observed

Nuke density tests for the installation of lift 2 and 3 in grid 5 at the west end of the cell.

Work Comments/Observations and Timeline of Notable Events

0700 - Arrive on site, JSA tailgate meeting.
0800 - Begin performing density testing on second lift. Tests failed. Paul ask for recalibrate nuke gauge.
0830 - Begin performing standard counts in different locations of the site. Borrow pit, near pond, north haul road of the cell. Phone Jason Franks for advice/help.
0930 - Resume density testing at the same general area on the west end of the cell. Continuously receive failing tests.
1000 - Collect sample 2 in the cell at the west end of lift 2. Steger proceed to disc, water and compact lift 2.
1115 - Resume density testing on lift 2.
1300 - Continue reworking lift 2 in grid 5 at the west end of the cell.
1400 - Perform density tests on lift 2. Density tests continue to fluctuate in results. Steger proceed to disc, water and compact for retests.
1500 - Retest lift 2 at the west end of the cell.
1545 - Steger proceeded to install lift 3.
1700 - Perform density testing on lift 3.
1730 - Steger rework lift 3 until end of shift.
1900 - SCS and Steger left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 11, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	16:30
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 60 F, Clear, Wind 5-10mph ESE
PM: 86 F, Clear, Wind 5-10mph ENE

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (8)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Grid 5, west end of the cell.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuclear Density Gauge, Standard Counts documented in Compaction Spreadsheet and field book.

Tests Completed/Observed

Nuke density tests for the installation of lifts 1, 2, and 3. Shelby Tube samples

Work Comments/Observations and Timeline of Notable Events

0630 - Arrive on site. JSA tailgate meeting then resume to start density testing.
0730 - Begin density testing lift 3 on the west end of the cell.
0830 - Steger begins discing and watering lift to get moisture. Begin installing lift 1 in grid 4 at the west "V" ditch to middle of cell.
0945 - Retest lift 3 after compaction.
1045 - Operations for installing lift 1 continues.
1115 - Proceed to perform density testing on lift one in grid 4, west and east of the "V" ditch.
1145 - Terracon tech arrive on site with a nuke gauge.
1200 - Begin performing density tests between Terracon and SCS for comparison. Tests were performed in middle grid of the cell. 1400 - Complete lift 1 in grid 3 and 4 of the cell.
1500 - Haul trucks went park and shut down. Steger collected shelly tube samples (4) at the west end of the cell. Filled holes with bentonite powder.
1600 - Steger begins to park and shut down all equipment and tools to prepare to exit site.
1630 - SCS left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 22, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	8:00
SCS Engineers Project No:	27224513.00	Stop Time:	19:00
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 65 F, Cloudy, Wind 10-15mph SSW
PM: 83F, Clear, Wind 10-15mph WSW

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (8)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Lifts 2 and 3 of the bottom half of the west slope and center of the cell.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuclear Density Gauge, Standard Counts documented in Compaction Spreadsheet and field book.

Tests Completed/Observed

Nuke density testing in grid 03.02, 04.02 and 04.03. All density tests passed in field.

Work Comments/Observations and Timeline of Notable Events

0800 - Arrive on site. Begin tailgate JSA meeting. Discuss start up plans with Paul due to over the weekend rain received on site. Plans are to blade haul roads on site and shave surface of the east installed material for it to dry. It will take Steger crew all morning to get ready for any density testing.

0830 - SCS RPR left site until Steger crew is ready.

1230 - RPR returned on site. Steger crew continues installing and compaction of lift 2 on bottom half of the west slope and center of the cell.

1300 - RPR begin nuke gauge start-up.

1400 - Steger continue to install second lift at bottom half of the west slope and west "V" ditch.

1430 - RPR begin to test the second lift on the bottom half of the west slope after compaction has been completed. Steger crew proceed to install lift 2 in grid 3, center of the cell between both "V" ditches.

1500 - RPR tested the second lift of the center of the cell between both "V" ditches.

1600 - Steger crew proceed to install lift 3 on the bottom half of the west slope.

1630 - RPR performed density tests on grid 3, center of the cell between "V" ditches.

1700 - Compaction is completed on the third lift of the bottom half of the west slope. Mini-x blade areas for density testing.

1730 - RPR performed density tests on lift 3 of the bottom half of the west cell Steger crew proceed to install lift 3 in grid 3, the center of the cell.

1800 - Steger crew continues to complete lift 3 in the center of the cell with compaction. Lift 2 begins in grid 2 at the east "V" ditch. 1830 - Steger crew stop installing and begin shut down and servicing equipment.

1900 - SCS and Steger left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 23, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	14:30
Project Location:	Climax Molybdenum Industrial Landfill Fort Madison, Iowa		

Weather Information

AM: 60 F, Partly Cloudy, Wind 5-10mph NNE
PM: 74 F, Cloudy, Wind 0-5 NE

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (7)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Borrow Pit. Haul Roads

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

NA

Tests Completed/Observed

No nuke density testing performed.

Work Comments/Observations and Timeline of Notable Events

0630 - Arrive on site.
0700 - Begin morning tailgate JSA meeting. Plans to dewater cell, blade haul roads and dress up borrow area until material dries up to proceed with clay liner installation.
0730 - Steger crew begins cleaning/dressing areas at the borrow pit with D6T dozer. Begin dewatering cell. Blade and dress haul roads.
0800 - Rolls of geotextile were delivered on site.
0900 - Relocate to borrow pit for dewatering.
1000 - Excavator begins loading stockpiled material removed from cell near road entrance to the borrow pit onto haul trucks to stockpile closer to the borrow pit.
1100 - 1400 - All operations continue.
1430 - SCS and Steger left site.

Material(s) Delivered to Site

3 Rolls of Geotextile

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 24, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	19:30
Project Location:	Climax Molybdenum Industrial Landfill Fort Madison, Iowa		

Weather Information

AM: 63 F, Partly Cloudy, Wind 10-15mph NNE
PM: 75 F, Clear, Wind 10-15mph NNE

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (7)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Lift 2 and 3 from center to east end of cell. West "V" ditch.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuclear Density Gauge, Standard Counts documented in Compaction Spreadsheet and field book.

Tests Completed/Observed

Nuke Density testing lift 2 and 3 on east half of the cell. Observed trimming/grading after installation and testing completion. Observed HDPE pipe tie-in by blind flange at the west "V" ditch.

Work Comments/Observations and Timeline of Notable Events

0630 - Arrived on site. Begin tailgate JSA meeting.
0700 - Begin equipment start-up. Dewater the standing water in the west "V" ditch.
0800 - Excavator begins loading shaved wet material onto haul trucks to discard back to the borrow pit.
0900 - Excavator relocated to the borrow pit to begin loading good dry material onto haul trucks to transport for lift installation.
1100 - Begin density testing on lift 3 in grid 3 and proceeded to test lift 2 in grid 2.
1200 - Lift installation to the east half of the cell continues. Trimming and grading begins at the west end of the cell. Tractor with box grade and roller begins smoothing out haul truck tracks in the cell and roads.
1300 - Complete lift 2 installation in east half of the cell, proceed to install lift 3 in grid 2. Perform testing on lift 2 in grid 1.
1400 - All operations continue. One load of gravel arrived on site and was unloaded south of the haul road on the southwest end of the cell.
1500 - Grading operation continues. Lift 3 installation continues.
1615 - Complete lift 3 installation at the east half of the cell. Excavator relocates to cell and stage at the access road to load trimmed material onto haul trucks to return to borrow pit. Compaction continues at east half of cell.
1645 - Perform density tests on lift 3 on the east half of the cell.
1715 - Steger crew begin installing stakes by survey points for HDPE pipe installation at the west "V" ditch and location of anchor trench near exposed pipe.
1730 - Begin excavation for pipe installation at the west "V" ditch.
1800 - Install gravel in trench before installing pipe. Both dozers continue to trim and grade east half of the cell.
1845 - Begin installing flange connector onto existing pipe for valve. Installed approximately 15' of pipe with flange to the north end of the west pipe line.
1915 - Install valve to new pipe. Installed "Y" with flange connectors to existing pipe.
1930 - SCS and Steger left site.

Material(s) Delivered to Site

1 load of gravel

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 25, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	18:30
Project Location:	Climax Molybdenum Industrial Landfill Fort Madison, Iowa		

Weather Information

AM: 50 F, Clear, Wind 5-10mph E
PM: 79 F, Clear, Wind 5-10mph E

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (6)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Upkeep/dress the borrow pit. West and East "V" ditch. Trimming/grading at east end of cell.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Nuke gauge density testing completed as of 9/24/25.

Tests Completed/Observed

HDPE pipe installation. Grading.

Work Comments/Observations and Timeline of Notable Events

0630 - Arrive on site.
0700 - Begin morning tailgate JSA meeting. Steger crew begins cleaning/dressing areas at the borrow pit with D6T dozer. Begin trimming/grading the remainder of the east end of the cell. Begin valve connection to "Y" at the west "V" ditch.
0800 - Complete valve and cleanout installation along with approximately 20' of pipe.
0830 - Install aquablok and gravel over flanges.
0900 - Relocate to the east ditch and begin excavation. Semi arrive with two heavy equipment. Unload near the borrow pit.
0945 - One load of gravel arrive on site and unloaded at stockpile. One load of sand was delivered and unloaded at the staging area near rolls of geomembrane.
1000 - Steger crew begin installing "Y" with flange to existing pipe on south end. Install valve to 20' pipe. Tighten bolts and nuts to the flanges. Transport truck arrive on site with a mini-x and skid steer, unloaded near the borrow pit.
1100 - Begin installing aquablok over flanges and gravel over solid pipe leaving leading end exposed. Deere skid steer begins backdragging bucket to smooth subgrade and remove clumps. Cat skid steer with hydraulic smooth drum roller follow behind Deere skid steer for smoothing surface.
1200 - Steger complete valve and cleanout installation at the east leachate ditch. Skid steers continue operations. Install clay liner around pipe at the north end of the west and east ditch.
1300 - Progress meeting. Deere 50G Mini-X with hydraulic jackhammer begins compacting surface around pipes.
1830 - SCS and Steger left site.

Material(s) Delivered to Site

Load of gravel

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 26, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	18:30
Project Location:	Climax Molybdenum Industrial Landfill Fort Madison, Iowa		

Weather Information

AM: 55 F, Clear, Wind 5-10mph W
PM: 83 F, Clear, Wind 5-10mph S

Contractors, Personnel, and Equipment On Site

Steger Construction Crew (4), CAAW Crew (9)
Komatsu Dozer, Cat D6T Dozer, Deere 350 Excavator, (2) Cat Haul Trucks, Cat 299D Skid Steer, Deere 333G Skid Steer, Deere 50G Mini-X, Cat 308 Mini-X

Work Areas/Boundaries

West Slope. West Leachate Ditch. West, North and South anchor trench.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tensiometer. Geomembrane trial tests.

Tests Completed/Observed

Trial welds for fusion welder and extrusion welder.

Work Comments/Observations and Timeline of Notable Events

0630 - Arrive on site with Steger crew (4) and superintendent for CAAW waiting for the rest of CAAW crew to arrive.
0700 - Begin tailgate JSA meeting. CAAW begin measurements and deployment planning. Load tools and equipment. Steger crew (2) resume trenching from previous day.
0800 - CAAW begin unloading tools and equipment into the cell. Steger begins stockpiling spoils at the southeast end outside of the cell boundaries. Meet with Mandy, Paul and Gerald and discuss plans and activities.
0900 - CAAW begin boot repair on the north end of the west leachate ditch. CAAW begins staging sandbags near anchor trench on the west end of the cell.
0945 - Test trial welds before any welding begins.
1000 - Begin panel deployment on the west leachate ditch. Steger crew continues operations.
1100 - Test more trial welds for the fusion welder. Continue panel placement on the west slope. CAAW takes one hour lunch.
1200 - Continue boot repairs for the west leachate line. Steger crew begin prepping for geotextile installation. CAAW return from lunch and continues liner deployment.
1300 - Begin extrusion welding boot repair. Begin fusion welding seams. Continue deployment on the west slope.
1400 - Complete deployment and fusion seaming on the west slope.
1500 - Complete pipe boot for the west leachate line. Begin installing double bands for each pipe boot. Begin air testing seam P-1/P-2 then proceeded to repairs then vacuum testing so Steger can install geotextile, gravel and pipe.
1600 - Steger installs aquablok around the north end of the east leachate pipe. Relocated to the west ditch to install geotextile and gravel.
1700 - Complete west leachate line. CAAW deploy panel in the east ditch and begin pipe boot repair on the north end of ditch. Steger use electrofusion coupling to bind the pipes together then proceeded to install gravel over pipe. Open existing valve for the west leachate line. CAAW deploy one more panel east of the panel in the east leachate ditch and fusion weld seam.
1800 - CAAW complete pipe boot repair. Both crews begin picking up tools and shutting down equipment.
1830 - SCS and Steger left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh

Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 27, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	19:30
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 56 F, Clear, Wind 5-10mph WSW
PM: 85 F, Clear, Wind 5-10mph WSW

Contractors, Personnel, and Equipment On Site

Steger Construction Crew (4), CAAW Crew (9)
Komatsu Dozer, Cat D6T Dozer, Deere 350 Excavator, (2) Cat Haul Trucks, Cat 299D Skid Steer, Deere 333G Skid Steer, Deere 50G Mini-X, Cat 308 Mini-X

Work Areas/Boundaries

East half of the north and south anchor trench, East anchor trench. East end of cell and in-between leachate lines.

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tensiometer. Geomembrane trial tests.

Tests Completed/Observed

Trial welds for fusion welder and extrusion welder.

Work Comments/Observations and Timeline of Notable Events

0630 - Arrive on site with Steger crew (4) and CAAW crew. Begin tailgate JSA meeting.
0700 - CAAW begin start-ups and loading tools and equipment to take into the cell.
0745 - Welders make trial welds and liner deployment begins.
0800 - Install bands for the pipe boot at the north end of the east leachate line. Observe and test trial welds for fusion welder. Begin fusion seaming after trial test pass.
0900 - Begin south pipe boot of the east leachate line. Deployment begins running from east to west on the east slope starting at the northeast corner and proceed south. Steger crew begin excavation to find collapse leachate line.
1030 - Observe and test trial weld for extrusion welder.
1045 - Begin air testing seams at the east end.
1100 - CAAW takes one hour lunch while superintendent begin extrusion welding pipe boot repair on the south end of the east leachate line.
1200 - CAAW returns from lunch and resume deployment and finish repairs near east leachate line along with vacuum testing for Steger crew to install geotextile, gravel and pipe.
1300 - CAAW begins cutting out destructive samples. Steger crew installs the geotextile and gravel in the east leachate line.
1400 - Steger crew then proceed to install pipe with electrofusion couplings then gravel over pipe. CAAW complete liner installation at the east end and resume air testing and proceed with repairs in east anchor trench.
1500 - Steger continue with operations. CAAW also continues with their operations.
1600 - Steger begins excavation for the rest of the south trench for liner crew to deploy in between leachate lines.
1615 - CAAW begins liner deployment from high-point going west to P-1.
1745 - CAAW installs the last panel. Begin housekeeping and stowing away unneeded tools and equipment.
1845 - Finish fusion welding seams and stow away machine in the trailer and exits site.
1930 - SCS and Steger left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 28, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	6:30
SCS Engineers Project No:	27224513.00	Stop Time:	13:30
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 57 F, Clear, Wind 5-10mph SSW
PM: 87 F, Clear, Wind 5-10mph SSE

Contractors, Personnel, and Equipment On Site

Steger Construction Crew (4), CAAW Crew (9)
Komatsu Dozer, Cat D6T Dozer, Deere 350 Excavator, (2) Cat Haul Trucks, Cat 299D Skid Steer, Deere 333G Skid Steer, Deere 50G Mini-X, Cat 308 Mini-X

Work Areas/Boundaries

Entire cell. Anchor trenches

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

Tensiometer. Geomembrane trial tests.

Tests Completed/Observed

Trial welds for fusion welder and extrusion welder.

Work Comments/Observations and Timeline of Notable Events

0630 - Arrived on site. Steger was waiting on site.
0700 - CAAW superintendent arrive on site. JSA tailgate meeting and discussions. Steger begins backfilling anchor trench on the east end and works around to the north. I mark DS.4 proceed to double check and seek for missing information on the installed geomembrane.
0800 - Rest of CAAW crew arrive on site. They have a JSA tailgate meeting. Observe and test trial welds and destructive samples. CAAW begin housekeeping in and around the cell. Perform air tests and repairs and vacuum testing.
0900 - All operations continue.
1000 - Operations and procedures continue for next few hours.
1100 - CAAW begins loading trailer with tools and equipment.
1230 - CAAW complete tasks and proceed to finish packing trailer.
1300 - CAAW exits site. Steger continues backfilling.
1330 - SCS and Steger left site.

Material(s) Delivered to Site

N/A

Lena Sengphachanh
Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	September 30, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	8:00
SCS Engineers Project No:	27224513.00	Stop Time:	17:15
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 61 F, Cloudy, Wind 1-10mph
PM: 84 F, Cloudy, Wind 1-10mph

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (3)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Entire cell

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Tests Completed/Observed

N/A

Work Comments/Observations and Timeline of Notable Events

0800: SCS onsite, JSA and Safety plan reviewed and signed
0815: Site and broken leachate line observed and photographed
0830: Contractor began using the Cat 299D with fork attachment to move the plywood and Nate assisted with placing the plywood along the southern edge of the liner.
0900: Contractor provided new leachate Y-pipe and couplers
0910: Plywood placement continued until the contractor ran out of plywood
0930: Contractor began excavating leachate contaminated soil around the pipe with the 308 excavator
0945: The new pipe was short about 10 inches, contractor began fused 10 inch extension
0955: Paul began placing berm on top of the placed plywood with 350 excavator and compacting it slightly with the bucket
1025: A pickup truck arrived with more plywood
1030: 10 inch extension on the Y-pipe fused
1040: Contractor used the 308 excavator to dig underneath where the pipe will be placed, Paul continued placing the berm along the southwest and western edges of the liner
1050: Contractor began cleaning off the soil on the pre-existing pipe, attaching the couplers then placing the Y-pipe.
1100: New leachate pipe installed
1105: Contractor hauled the leachate contaminated soil to the top of the active cell using the Cat 333G
1130: Contractor began backfilling the excavated leachate pipe pit with aggregate at the level of the pipe using the 350 excavator, Paul began tamping the anchor trench in the north
1135: Contractor began using soil to backfill after aggregate was placed and compacting each soil lift
1235: Backfilling of the excavated pit complete, contractor used the 51px dozer to grade and level the area
1300: Placement of plywood along the southern edge of liner continued
1310: Plywood placed along entire southern edge of liner, Liner test results delayed, may cause a delay filling the following day
1320: Contractor began placing berm on the southern edge of the liner using the 350, and Paul returned to tamping the northern anchor trench
1340: Tamping of the northern anchor trench continued
1400: Contractor began installing leachate valves, using the 308 excavator to fill in area around leachate valves and cleanouts
1450: Contractor began fusing 4ft leachate cleanout extensions
1600: Contractor began fusing piezometer
1650: Contractor placed piezometer and used the 350 excavator to place aggregate around the piezometer
1715: SCS left site.

Material(s) Delivered to Site

Semir Omerovic

Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	October 1, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	7:00
SCS Engineers Project No:	27224513.00	Stop Time:	18:15
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: 57 F, Sunny, Wind 1-10mph
PM: 88 F, Sunny, Wind 1-10mph

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (3)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Entire site

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Tests Completed/Observed

Lab conformance testing for sand drainage layer and leachate collection system aggregate

Work Comments/Observations and Timeline of Notable Events

0700: SCS onsite
0730: First trucking hauling sand arrived, Contractor directed truckers to dump on the active cell until test results were received. Hauling continued for several hours
1200: Contractor began tamping the soil around the leachate valve and cleanout
1235: Lab test results passed, contractor began preparing to spread sand on the northwest portion of the fill area
1250: Contractor began spreading sand onto the fill area using the D6T Dozer
1315: While haul trucks continued to transport sand, contractor began hauling the sand piled on the active face to the northwestern portion of fill area using the CAT haul trucks onsite and the 350 excavator to load the sand
1450: Contractor placed geotextile fabric over western pipe and aggregate
1500: Contractor began using the 350 excavator to assist with spreading sand in addition to the D6T Dozer
1520: Contractor began adding dirt to berm and shaping the berm using the 51px Dozer
1630: Last haul truck arrived, the contractor continued hauling sand stored on top of the active cell until pile was exhausted
1815: SCS left site.

Material(s) Delivered to Site

Sand for drainage layer

Semir Omerovic

Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	October 2, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	7:00
SCS Engineers Project No:	27224513.00	Stop Time:	16:40
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: Partly Cloudy, 59 F, wind: 1-5 mph
PM: Sunny, 87 F, wind 1-5 mph

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (3)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Entire site

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Tests Completed/Observed

N/A

Work Comments/Observations and Timeline of Notable Events

0700: SCS onsite
0715: First haul truck arrived
0720: Contractor began spreading sand across the eastern portion of the fill area using the D6T Dozer for the next several hours
0930: Contractor grabbed three sand samples
1005: Contractor covered eastern leachate pipe and aggregate with geotextile fabric
1200: CCS landfill operating crew arrived to look at the site
1400: Contractor moved the northern terrace forward using the 350 excavator to move out of the way of CCS landfill crew for when they begin work
1440: Contractor began shaping and finalizing the berms using the 51px dozer
1545: Contractor began pushing small amount of sand on the central portion of the fill area using the 333G
1555: The last haul truck arrived
1640: SCS and Steger left site.

Material(s) Delivered to Site

Sand for drainage layer

Semir Omerovic

Construction Observer

SCS ENGINEERS

DAILY FIELD ACTIVITIES REPORT

Client Name:	Climax Molybdenum Company	Date:	October 2, 2025
SCS Engineers Project Name:	Phases 4-6	Start Time:	7:00
SCS Engineers Project No:	27224513.00	Stop Time:	13:30
Project Location:	Climax Molybdenum Industrial Landfill		
	Fort Madison, Iowa		

Weather Information

AM: Sunny, 61 F, wind: 1-5 mph
PM: Sunny, 88 F, wind 1-5 mph

Contractors, Personnel, and Equipment On Site

Steger Construction Inc. Crew (3)
Deere 350 Excavator, Cat D6T Dozer, Komatsu 51PX Dozer, Cat 740 Haul Truck (2), Cat CP-563C Compactor, Deere 50G Mini-X, Case III 7240 Tractor w/ disc attachment, Water Truck

Work Areas/Boundaries

Entire site

Testing Equipment Used/Observed and Calibration/Re-Calibration Documentation

N/A

Tests Completed/Observed

N/A

Work Comments/Observations and Timeline of Notable Events

0700: SCS onsite
0720: First haul truck arrived
0720: Contractor began spreading sand across the central portion using the 51px Dozer
0940 Contractor used the 350 Excavator to place a small amount of sand on the leachate pipe and aggregate
1130: Contractor began hauling equipment offsite, 350 Excavator was hauled offsite
1240: Surveyor arrived at site
1315: Sand filling complete
1330: SCS and Steger left site.

Material(s) Delivered to Site

Sand for drainage layer

Semir Omerovic

Construction Observer

SCS ENGINEERS

Appendix G

Photo Log



Photo #1:

Date: 9/4/2025

Direction (facing): East

Description: Excavation of subgrade.



Photo #2:

Date: 9/5/2025

Direction (facing): East

Description: Continued subgrade preparation.



Photo #3:

Date: 9/8/2025

Direction (facing): Northwest

Description: Staking the existing leachate line during subgrade preparation.



Photo #4:

Date: 9/8/2025

Direction (facing): Northeast

Description: Water truck conditioning the subgrade at east end of the Phases 4-6.



Photo #5:

Date: 9/8/2025

Direction (facing): Northeast

Description: Placement and compaction of soil for compacted soil liner along east portion of cell for first lift.



Photo #6:

Date: 9/9/2025

Direction (facing): Northeast

Description: Using haul truck to compact eastern portion of cell.



Photo #7:

Date: 9/9/2025

Direction (facing): South

Description: Placement and compaction of soil for compacted soil liner along west portion of cell.



Photo #8:

Date: 9/10/2025

Direction (facing): Southeast

Description: Second lift placement in west portion.



Photo #9:

Date: 9/10/2025

Direction (facing): Southeast

Description: Placement and compaction of third lift on west portion.



Photo #10:

Date: 9/11/2025

Direction (facing): South

Description: Shelby tube sample collection.



Photo #11:

Date: 9/22/2025

Direction (facing): Northeast

Description: Placement and compaction on the third lift of the bottom half of the west portion.



Photo #12:

Date: 9/23/2025

Direction (facing): North

Description: Dewatering western portion of Phases 4-6.



Photo #13:

Date: 9/24/2025

Direction (facing): Northeast

Description: Connecting the leachate collection line and cleanouts to the existing line along the southern boundary.



Photo #14:

Date: 9/25/2025

Direction (facing): North

Description: Continuing the HDPE pipe installation for the leachate collection line.



Photo #15:

Date: 9/26/2025

Direction (facing): Southeast

Description: Installation of the flexible membrane liner along the west slope.



Photo #16:

Date: 9/27/2025

Direction (facing): South

Description: Installation of the geotextile and gravel in the leachate lines.



Photo #17:

Date: 9/28/2025

Direction (facing): West

Description: Backfilling anchor trench.



Photo #18:

Date: 9/30/2025

Direction (facing): East

Description: Installation of the plywood boards for the liner tie-in location and protection along the southern boundary.



Photo #19:

Date: 10/1/2025

Direction (facing): East

Description: Sand drainage layer placement.



Photo #20:

Date: 10/2/2025

Direction (facing): Southeast

Description: Sand drainage layer placement continued.



Photo #21:

Date: 10/3/2025

Direction (facing): Southwest

Description: Sand drainage layer completion.