DOF DALTON OLMSTED FUGLEVAND

To: Brian Cape, Clean Earth

From: Patrick Hsieh, DOF

Cc:

Date: July 24, 2025

Subject: Evaporation Pond Completion Documentation
Clean Earth Fernley, Nevada – RCRA Permit NEVHW0033
Permit Section 10.8.4.1 Reporting

Dalton, Olmsted, and Fuglevand (DOF) prepared this memorandum on behalf of Clean Earth regarding the replacement of the stormwater evaporation pond at the Clean Earth Nevada Facility (Figure 1).

Construction began on June 16, 2025 and was completed on June 25, 2025. There were no indications of staining or discoloration of soils under the secondary liner upon inspection on June 17, 2025. Grading and pond construction specifications were based on design requirements from the original pond construction drawings provided by Clean Earth with modifications to meet existing site conditions and material availability (details provided in Attachment 1 Contractor Submittal Backup Documentation and Attachment 2 Photo Log).

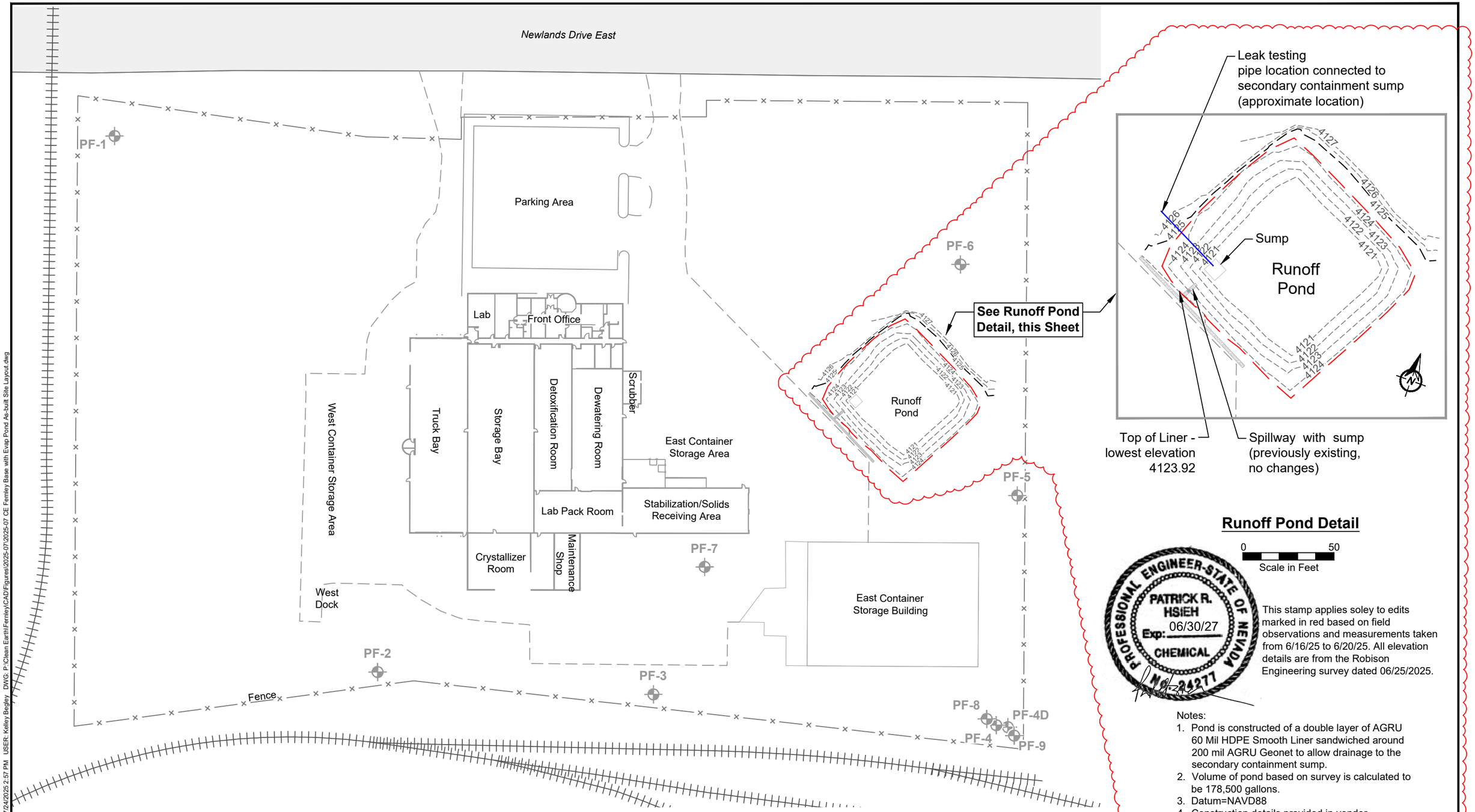
If you have questions, please contact Patrick Hsieh at (206) 731-7550 (phsieh@dofnw.com).

Attachments:

Figure 1	Site Layout- with pond As-built
Attachment 1	Contractor Submittal Backup Documentation
Attachment 2	Photo Log

Figures

Clean Earth
Fernley, Nevada



Runoff Pond Detail

0 50
Scale in Feet

PROFESSIONAL ENGINEER-STATE OF NEVADA
PATRICK R. HSIEH
Exp: 06/30/27
CHEMICAL
No. 24277

This stamp applies soley to edits marked in red based on field observations and measurements taken from 6/16/25 to 6/20/25. All elevation details are from the Robison Engineering survey dated 06/25/2025.

Notes:

1. Pond is constructed of a double layer of AGRU 60 Mil HDPE Smooth Liner sandwiched around 200 mil AGRU Geonet to allow drainage to the secondary containment sump.
2. Volume of pond based on survey is calculated to be 178,500 gallons.
3. Datum=NAVD88
4. Construction details provided in vendor submittals.

Clean Earth Fernley Facility
Fernley, Nevada
Evaporation Pond Replacement As-built

Stormwater Pond Replacement As-built

DALTON OLMSTED FUGLEVAND

Figure 1

07/24/2025

ATTACHMENT 1

Contractor Submittal Backup Documentation

Clean Earth Fernley, Nevada

ECApplications

Preweld Test Report

Project Name: PSC Fernley Pond **Job #** 253041 **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth **Primary** X **Pond** X **Peel Test Extrusion Minimum** 78 **PPI**

Job Description: **Secondary** **Cell** **Peel Test Fusion Minimum** 91 **PPI**

Reported By : Roberto Aguilar **Pad** **Shear Test Minimum** 120 **PPI**

Weld Date	Weld Time	Operator Name / ID	Mach No	Mach Speed	Mach Temp	Preheat Temp	Amb Temp	Peel Extrusion 1	2	3	4	5		Peel Wedge 1	2	3	4	5	Shear 1	2	3	4	5	Test Results
6/24/25	6:56	Eduardo del Valle	19	13	800		73						A	128	109	153	108	116	155	147	149	154	151	Pass
													B	141	117	134	133	123						
6/24/25	10:25	Javier Celaya	119		480	350	79	128	116	118	123	128	A						140	139	138	142	142	Pass
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											

Panel Placement Log

Project Name: PSC Fernley Pond
Job # 253041
Superintendent: Marco Burgueno
Material Type: 60 Mil HDPE Smooth
Description:

Primary X
Secondary

Cell
Pond X
Pad
Depth & Width of AT 3.5

						Totals to Date			**12,105.00**	**1,260.00**	**13,365.00**
Panel #	**Roll Stock #**	**Deploy Date**	**Width 1 (Angle)**	**Side 1 Length (Angle)**	**Width 2**	**Side 2 Length**	**Circle (Dia)**	**LF in Trench**	**Panel Total SF**	**SF In Trench**	**Total SF (Pay Area)**
1	FNB0151960003	6/24/25	22.50	106.00	22.50	106.00		45.00	2,385.00	157.50	2,542.50
2	FNB0151960003	6/24/25	22.50	106.00	22.50	106.00		45.00	2,385.00	157.50	2,542.50
3	FNB0151960003	6/24/25	22.50	106.00	22.50	106.00		45.00	2,385.00	157.50	2,542.50
4	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
5	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
6	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
7	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
8	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
9	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
10	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
11	FNB0151960003	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
12	FNB0151960005	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
13	FNB0151960005	6/24/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-

ECApplications
Seam Control Form

Project Name: PSC Fernley Pond | **Job #** 253041 | **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth | **Primary** X | **Pond** X | **Air Pressure Test** 30 PSI

Job Description: | **Secondary** | **Cell** - | **Air Pressure Hold Time** 3 Minutes

Reported By Roberto Aguilar | **Pad** - | **Allowable Air Pressure Loss** 3 PSI

603 **Total LF of Welding to Date Combined** | **Extrusion LF Weld To Date** - | **Fusion LF Weld To Date** 603

Weld Date	Seam Number		Seam Length	Weld Time	Operator Name / ID	Mach Number	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp	Test Date	Test Type	PSI IN	Time (Mins)	PSI OUT	PSI Loss	Test Results
6/24/25	1	2	106	7:27	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	2	3	106	7:47	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	4	5	22	8:38	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	5	6	22	8:46	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	6	7	22	8:55	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	7	8	22	9:02	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	9	10	22	9:08	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	10	11	22	9:14	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	11	12	22	9:20	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	12	13	22	9:26	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	3	4	20	9:33	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	3	5	22.5	9:35	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	3	6	22.5	9:37	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	3	7	22.5	9:39	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	3	8	20	9:41	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	1	9	20	9:52	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass
6/24/25	1	10	22.5	9:54	Eduardo del Valle	19	13	800			6/24/25	Air Test	30	3	30		Pass

ECApplications
Seam Control Form

Project Name: PSC Fernley Pond | **Job #** 253041 | **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth | **Primary** X | **Pond** X | **Air Pressure Test** 30 PSI

Job Description: | **Secondary** | **Cell** - | **Air Pressure Hold Time** 3 Minutes

Reported By Roberto Aguilar | **Pad** - | **Allowable Air Pressure Loss** 3 PSI

603 **Total LF of Welding to Date Combined** | **Extrusion LF Weld To Date** - | **Fusion LF Weld To Date** 603

Weld Date	Seam Number	Seam Length	Weld Time	Operator Name / ID	Mach Number	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp
6/24/25	1 11	22.5	9:56	Eduardo del Valle	19	13	800		
6/24/25	1 12	22.5	9:58	Eduardo del Valle	19	13	800		
6/24/25	1 13	20	10:00	Eduardo del Valle	19	13	800		

Test Date	Test Type	PSI IN	Time (Mins)	PSI OUT	PSI Loss	Test Results
6/24/25	Air Test	30	3	30		Pass
6/24/25	Air Test	30	3	30		Pass
6/24/25	Air Test	30	3	30		Pass

ECApplications

Destructive Sample Information

Project Name: PSC Fernley Pond **Job #** 253041 **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth

Job Description:

Reported By : Roberto Aguilar

Primary ☒ **Pond** ☒

Secondary ☐ **Cell** ☐

Pad ☐

Peel Test Extrusion Minimum 78 **PPI**

Peel Test Fusion Minimum 91 **PPI**

Shear Test Minimum 120 **PPI**

DS No	Seam Number		Weld Date	Operator Name / ID	Mach No	Mach Speed	Mach Temp	Preheat Temp	Amb Temp	Peel Extrusion						Peel Wedge					Shear					Test Result
										1	2	3	4	5		1	2	3	4	5	1	2	3	4	5	
1	1	10	6/24/25	Eduardo del Valle	19	13	800		79						**A**	117	132	138	129	136	151	146	144	155	156	Pass
															B	128	133	130	116	137						
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											

ECApplications
Repair Report

Project Name PSC Fernley Pond | **Job # :** 253041 | **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth | **Primary** X | **Pond** X | **SF Patch Material** 50

Job Description: | **Secondary** | **Cell** | **LF Welded** 90.00

Reported by : Roberto Aguilar | **Pad**

Damage Codes

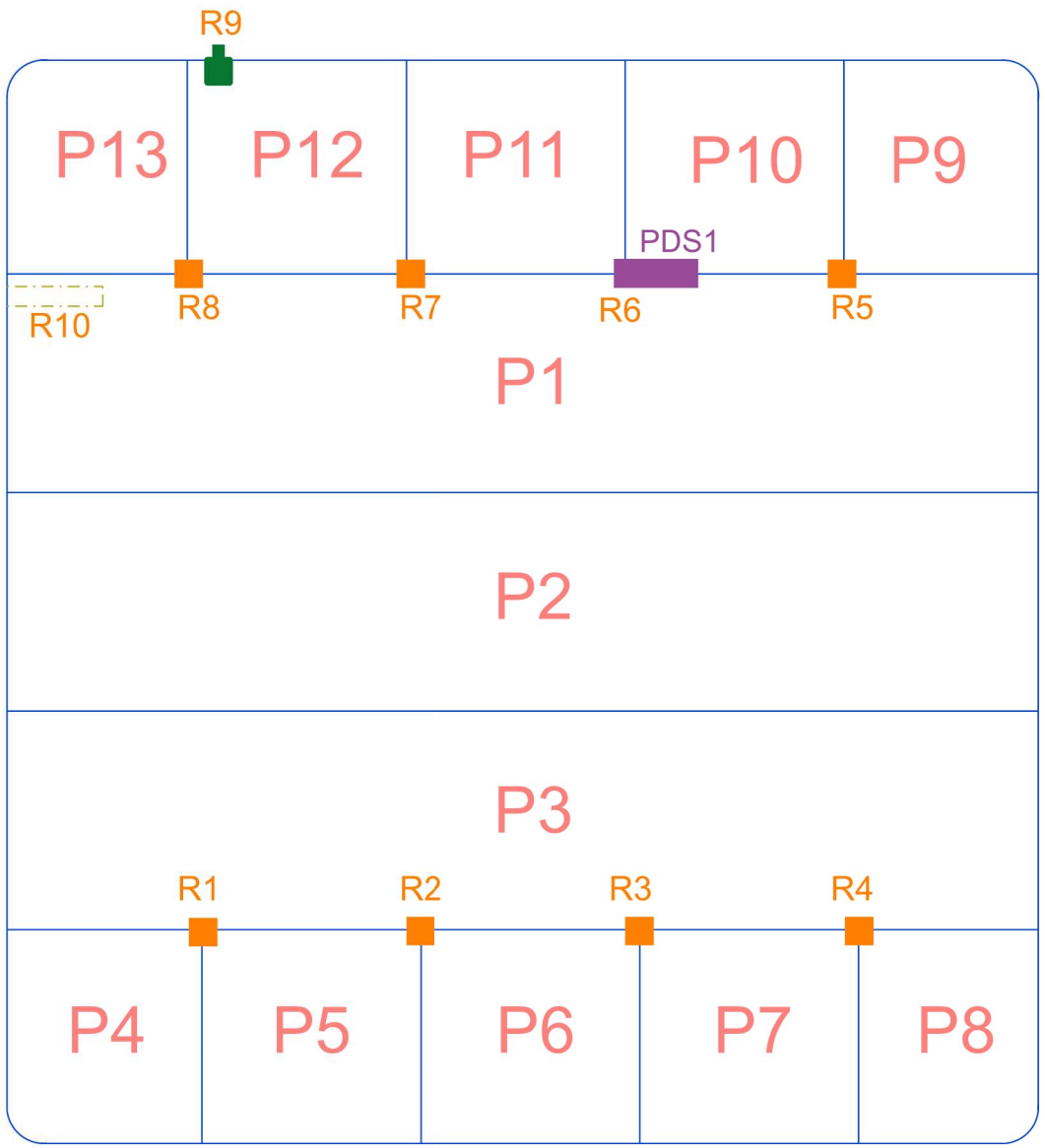
CR --Crease	FS --Failed Seam	MatD --Material Defect	LL --Lost Lap	CF --Custom Fit
DS --Destruct Sample	WR --Wrinkle	WS --Welder Restart	MD --Mechanical Damage	PB --Pipe Boot
SI --Subgrade Irregularity	AV --Airvent	RW --Roller Wrinkle	DO --Damage By Others	BO --Burn Out
SJ --Seam Joint	AO --Add On	CS --Concrete Structure		AT -Air Test

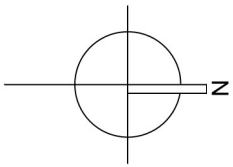
Location Abbreviations

BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

Test Type	Abbrv.	Repair Types
Vacuum	*S=South	C--Cap Strip
Air Test	*N=North	P--Patch
Spark	*W=West	B--Extrusion Bead
Air Lance	*E=East	

Repair Number	Damage Code	Seam Number	Panel Number	Location	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
1	SJ			3-4-5	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
2	SJ			3-5-6	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
3	SJ			3-6-7	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
4	SJ			3-7-8	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
5	SJ			1-9-10	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
6	DS1			1-10-11	P	2	x	7		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
7	SJ			1-11-12	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
8	SJ			1-12-13	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
9	PB		12	4'N	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25
10	CS		1	2' E - 2' N	P	2	x	2		6/24/25	Javier Celaya	119	Vacuum	Pass	6/24/25





Liner

Destructive

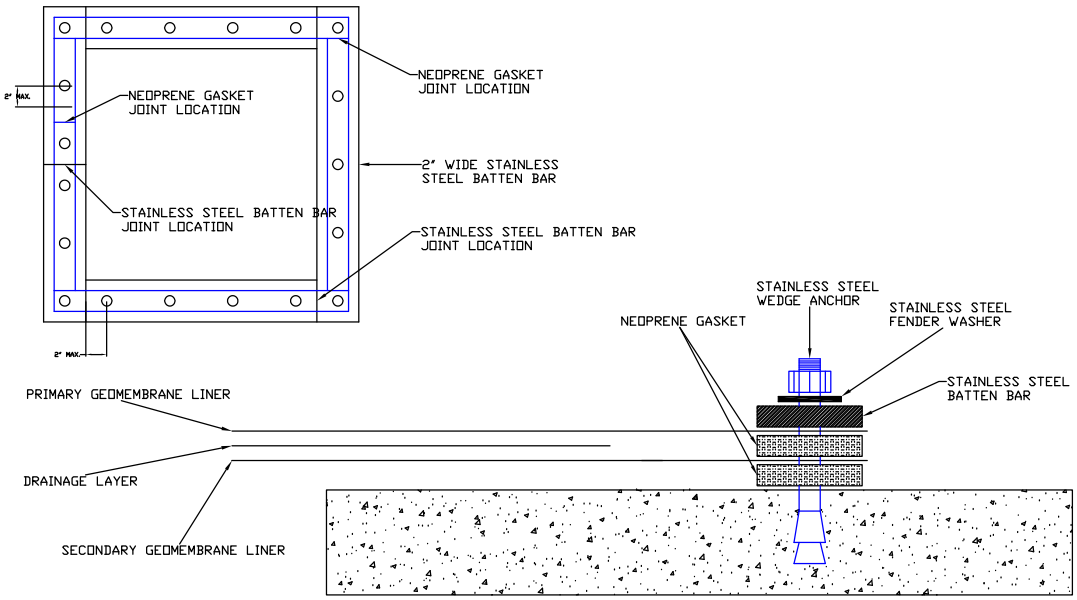
Repairs

REV	DATE	DESCRIPTION

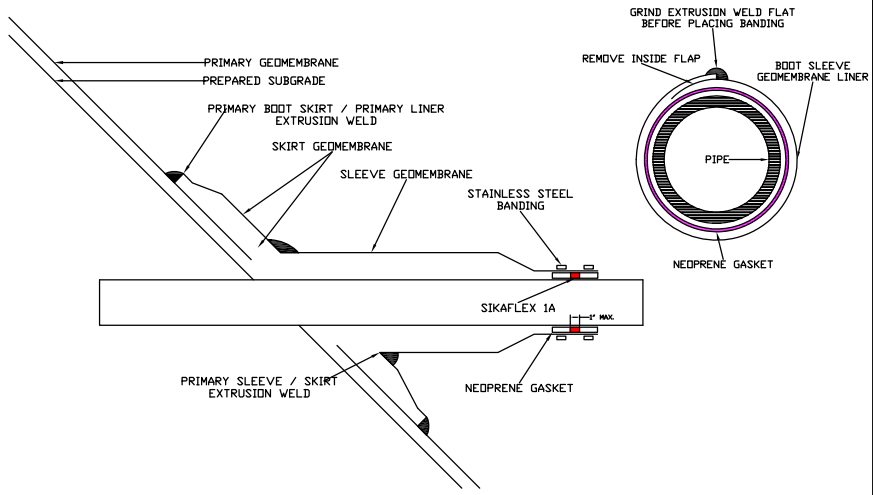
ECApplications
901 E. Orangethorpe Ave.
Anaheim, CA 92801
Phone: (714) 921-9848
Fax: (866) 475-1225

PROJECT NO:	253041
DRAWN BY:	RL
CHECKED BY:	
APPROVED BY:	
DATE:	
SCALE:	

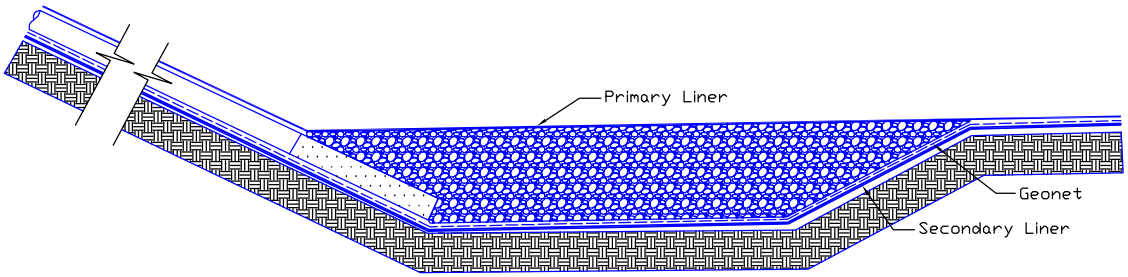
PROJECT NAME	SHEET TITLE	DRAWING NO.
PSC FERNLEY POND	60 MIL HDPE PRIMARY LINER AS-BUILT	1/2
		REVISION N/A



Detail A Mechanical Attachment

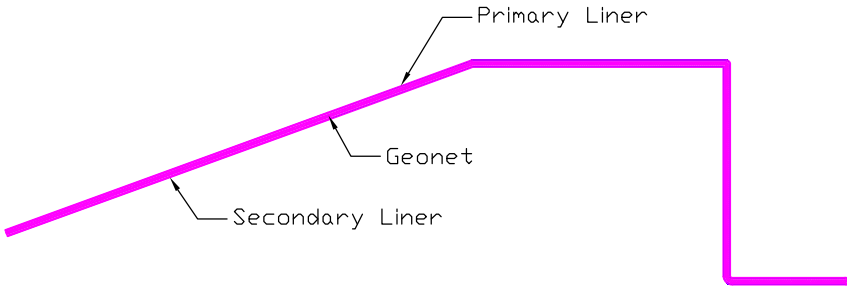


Detail B Pipe Penetration Boot



*** Riser Pipe and Drainage Gravel By Others

Detail C Sump Layout



Anchor Trench

REVISIONS/NOTES

PHILLIPS SERVICES
STORMWATER RETENTION BASIN

HDPE GEOMEMBRANE DETAILS

ECApplications INC.
901. ORANGETHORPE AVE
ORANGE, CA 92865
TELEPHONE: (714) 921-9848
FAX: (866) 475-1225

DRAWN BY: RB	CHKD. BY: CF	DWG. NO:
DATE: 5/15/25	APPRVD. BY: CF	1
PLOT SCALE: 1" =NST	PHILLIPS SERVICES	
PROJECT NO.: 253041		

ECApplications

Preweld Test Report

Project Name: PSC Fernley Pond **Job #** 253041 **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth **Primary** [ ] **Pond** [X] **Peel Test Extrusion Minimum** 78 **PPI**

Job Description: Pond **Secondary** [X] **Cell** [ ] **Peel Test Fusion Minimum** 91 **PPI**

Reported By : Roberto Aguilar **Pad** [ ] **Shear Test Minimum** 120 **PPI**

Weld Date	Weld Time	Operator Name / ID	Mach No	Mach Speed	Mach Temp	Preheat Temp	Amb Temp	Peel Extrusion 1	2	3	4	5		Peel Wedge 1	2	3	4	5	Shear 1	2	3	4	5	Test Results
6/23/25	6:50	Eduardo Del Valle	19	13	800		67						A	130	125	137	135	128	156	142	147	150	148	Pass
													B	141	127	138	120	119						
6/23/25	8:00	Javier Celaya	119		480	350	71	135	105	143	126	127	A						154	141	146	145	151	Pass
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											

Panel Placement Log

Project Name: PSC Fernley Pond
Job # 253041
Superintendent: Marco Burgueno
Material Type: 60 Mil HDPE Smooth
Description: Pond

Primary ☐
Secondary X
Cell ☐
Pond X
Pad ☐
Depth & Width of AT 3.5

						Totals to Date			**12,105.00**	**1,260.00**	**13,365.00**
Panel #	**Roll Stock #**	**Deploy Date**	**Width 1 (Angle)**	**Side 1 Length (Angle)**	**Width 2**	**Side 2 Length**	**Circle (Dia)**	**LF in Trench**	**Panel Total SF**	**SF In Trench**	**Total SF (Pay Area)**
1	FNB0151960004	6/23/25	22.50	106.00	22.50	106.00		45.00	2,385.00	157.50	2,542.50
2	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
3	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
4	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
5	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
6	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
7	FNB0151960004	6/23/25	22.50	106.00	22.50	106.00		45.00	2,385.00	157.50	2,542.50
8	FNB0151960004	6/23/25	22.50	106.00	22.50	106.00		45.00	2,385.00	157.50	2,542.50
9	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
10	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
11	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
12	FNB0151960004	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
13	FNB0151960003	6/23/25	22.50	22.00	22.50	22.00		22.50	495.00	78.75	573.75
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-
					-	-		-	-	-	-

ECApplications
Seam Control Form

Project Name: PSC Fernley Pond | **Job #** 253041 | **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth | **Primary** | | **Pond** X | **Air Pressure Test** 30 PSI

Job Description: Pond | **Secondary** X | **Cell** - | **Air Pressure Hold Time** 3 Minutes

Reported By Roberto Aguilar | **Pad** - | **Allowable Air Pressure Loss** 3 PSI

595 **Total LF of Welding to Date Combined** | **Extrusion LF Weld To Date** - | **Fusion LF Weld To Date** 595

Weld Date	Seam Number		Seam Length	Weld Time	Operator Name / ID	Mach Number	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp	Test Date	Test Type	PSI IN	Time (Mins)	PSI OUT	PSI Loss	Test Results
6/23/25	2	3	22	7:27	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	3	4	22	7:34	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	4	5	22	7:40	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	5	6	22	7:55	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	1	2	12	8:11	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	1	3	22.5	8:12	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	1	4	22.5	8:14	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	1	5	22.5	8:16	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	1	6	20	8:18	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	1	7	106	10:20	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	7	8	106	10:43	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	9	10	22	11:03	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	10	11	22	11:09	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	11	12	22	11:15	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	12	13	22	11:26	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	8	9	20	11:47	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass
6/23/25	8	10	22.5	11:49	Eduardo del Valle	19	13	800			6/23/25	Air Test	30	3	30		Pass

ECApplications
Seam Control Form

Project Name: PSC Fernley Pond | **Job #** 253041 | **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth | **Primary** | | **Pond** X | **Air Pressure Test** 30 PSI

Job Description: Pond | **Secondary** X | **Cell** - | **Air Pressure Hold Time** 3 Minutes

Reported By Roberto Aguilar | **Pad** - | **Allowable Air Pressure Loss** 3 PSI

595 **Total LF of Welding to Date Combined** | **Extrusion LF Weld To Date** - | **Fusion LF Weld To Date** 595

Weld Date	Seam Number	Seam Length	Weld Time	Operator Name / ID	Mach Number	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp
6/23/25	8 11	22.5	11:51	Eduardo del Valle	19	13	800		
6/23/25	8 12	22.5	11:53	Eduardo del Valle	19	13	800		
6/23/25	8 13	20	11:55	Eduardo del Valle	19	13	800		

Test Date	Test Type	PSI IN	Time (Mins)	PSI OUT	PSI Loss	Test Results
6/23/25	Air Test	30	3	30		Pass
6/23/25	Air Test	30	3	30		Pass
6/23/25	Air Test	30	3	30		Pass

ECApplications

Destructive Sample Information

Project Name: PSC Fernley Pond **Job #** 253041 **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth

Job Description: Pond

Reported By : Roberto Aguilar

Primary		**Pond**	X
Secondary	X	**Cell**	
		Pad	

Peel Test Extrusion Minimum	78	**PPI**
Peel Test Fusion Minimum	91	**PPI**
Shear Test Minimum	120	**PPI**

DS No	Seam Number		Weld Date	Operator Name / ID	Mach No	Mach Speed	Mach Temp	Preheat Temp	Amb Temp	Peel Extrusion 1	2	3	4	5		Peel Wedge 1	2	3	4	5	Shear 1	2	3	4	5	Test Result
1	8	10	6/23/25	Eduardo del Valle	19	13	800		70						A	123	126	131	123	132	156	148	144	151	148	Pass
															B	128	129	119	122	127						
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											
															A											
															B											

ECApplications
Repair Report

Project Name PSC Fernley Pond | **Job # :** 253041 | **Superintendent:** Marco Burgueno

Material Type: 60 Mil HDPE Smooth | **Primary** | **Pond** X | **SF Patch Material** 42

Job Description: Pond | **Secondary** X | **Cell** | **LF Welded** 74.00

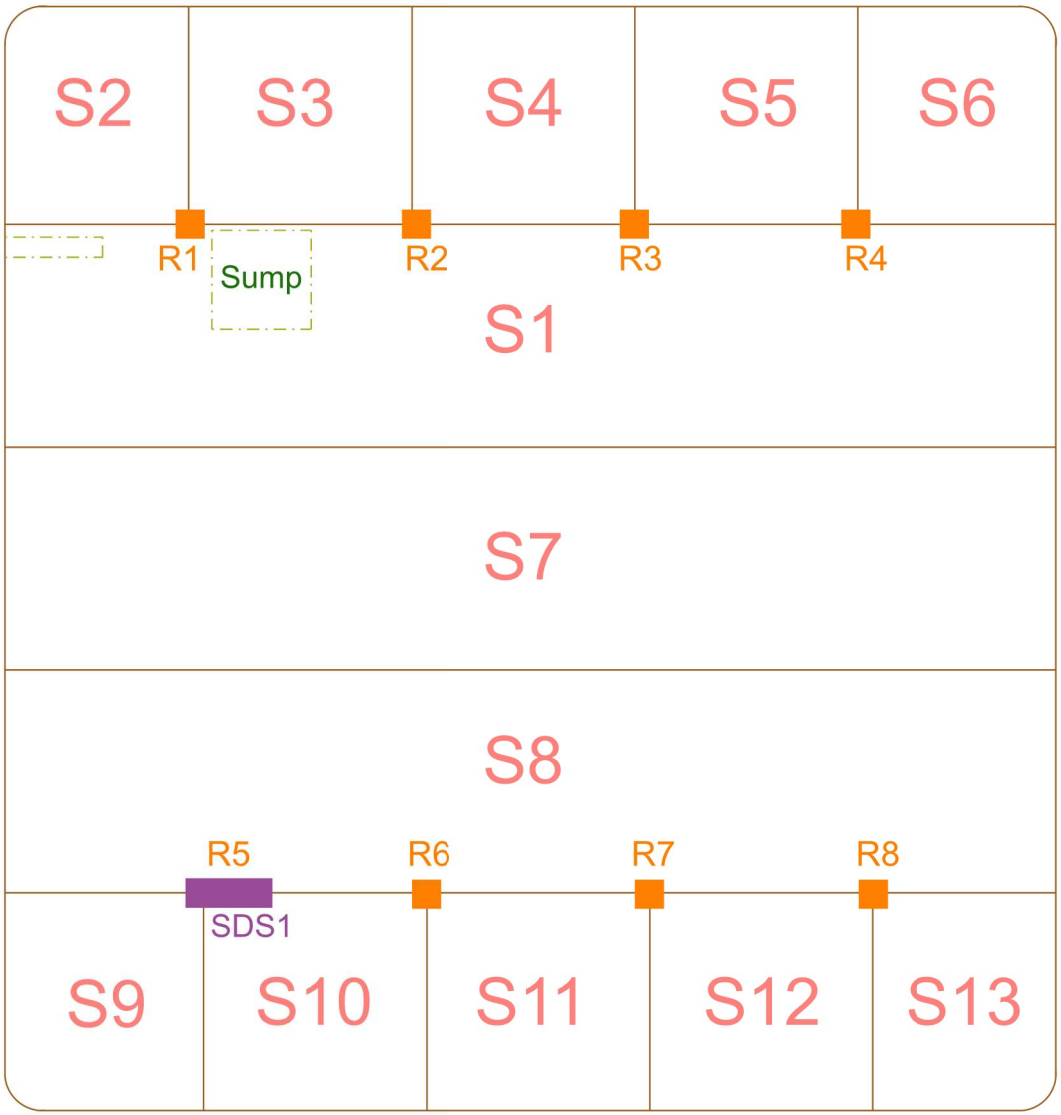
Reported by : Roberto Aguilar | **Pad**

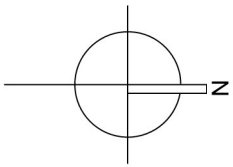
Damage Codes				
CR --Crease	FS --Failed Seam	MatD --Material Defect	LL --Lost Lap	CF --Custom Fit
DS --Destruct Sample	WR --Wrinkle	WS --Welder Restart	MD --Mechanical Damage	PB --Pipe Boot
SI --Subgrade Irregularity	AV --Airvent	RW --Roller Wrinkle	DO --Damage By Others	BO --Burn Out
SJ --Seam Joint	AO --Add On	CS --Concrete Structure		AT -Air Test

Location Abbreviations
BOS - Beginning of Seam
EOS - End of Seam
TOS - Toe of Seam
SJ - Seam Joint
ANT - Anchor Trench

Test Type	Abbrv.	Repair Types
Vacuum	*S=South	C--Cap Strip
Air Test	*N=North	P--Patch
Spark	*W=West	B--Extrusion Bead
Air Lance	*E=East	

Repair Number	Damage Code	Seam Number	Panel Number	Location	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
1	SJ			2-3-1	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
2	SJ			3-4-1	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
3	SJ			1-4-5	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
4	SJ			1-5-6	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
5	DS1			8-9-10	P	2	x	7		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
6	SJ			8-10-11	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
7	SJ			8-11-12	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25
8	SJ			8-12-13	P	2	x	2		6/23/25	Javier Celaya	119	Vacuum	Pass	6/23/25





Liner

Destructive

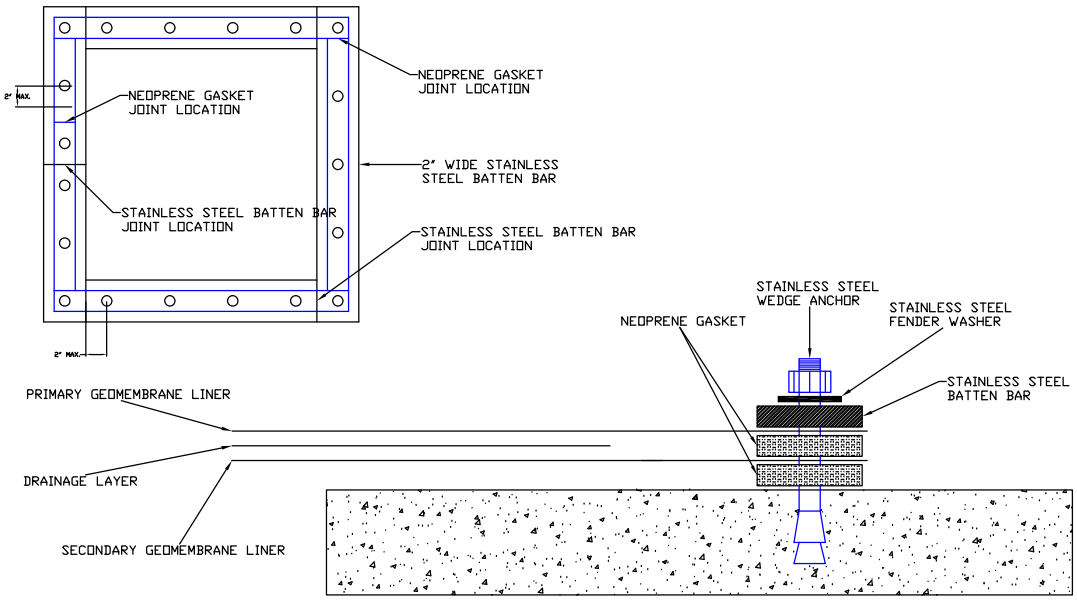
Repairs

REV	DATE	DESCRIPTION

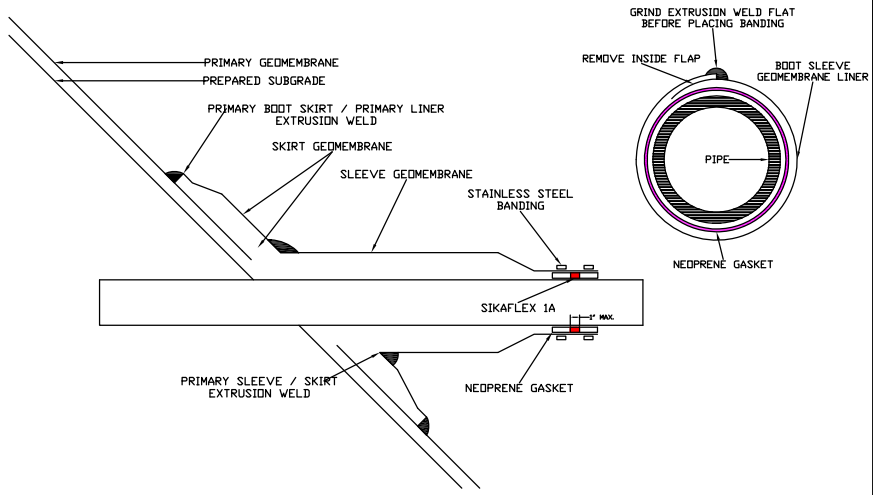
ECApplications
901 E. Orangethorpe Ave.
Anaheim, CA 92801
Phone: (714) 921-9848
Fax: (866) 475-1225

PROJECT NO:	253041
DRAWN BY:	RL
CHECKED BY:	
APPROVED BY:	
DATE:	
SCALE:	

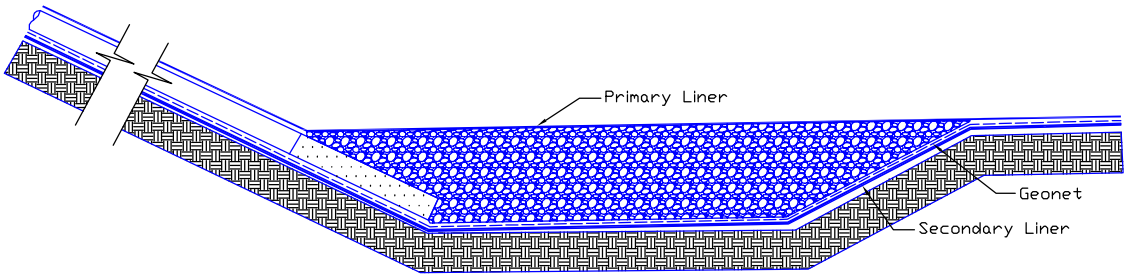
PROJECT NAME	SHEET TITLE	DRAWING NO.
PSC FERNLEY POND	60 MIL HDPE SECONDARY LINER AS-BUILT	1/2
		REVISION N/A



Detail A Mechanical Attachment

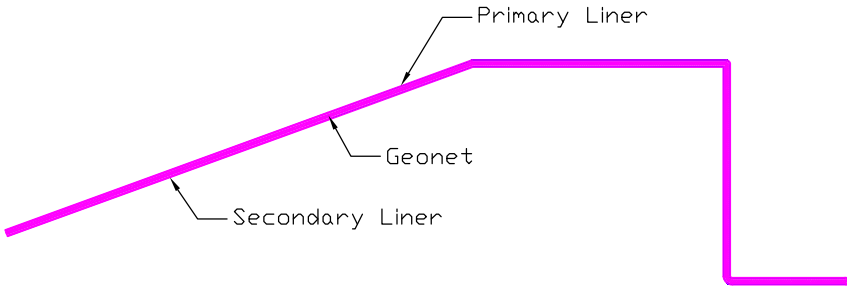


Detail B Pipe Penetration Boot



*** Riser Pipe and Drainage Gravel By Others

Detail C Sump Layout



Anchor Trench

REVISIONS/NOTES

PHILLIPS SERVICES
STORMWATER RETENTION BASIN

HDPE GEOMEMBRANE DETAILS

ECApplications INC.
901. ORANGETHORPE AVE
ORANGE, CA 92865
TELEPHONE: (714) 921-9848
FAX: (866) 475-1225

DRAWN BY: RB	CHKD. BY: CF	DWG. NO:
DATE: 5/15/25	APPRVD. BY: CF	1
PLOT SCALE: 1" =NST	PHILLIPS SERVICES	
PROJECT NO.: 253041		

CME CONSTRUCTION MATERIALS ENGINEERS, INC.
300 Sierra Manor Dr. Suite 1
Reno, NV 89511
Phone: (775) 851-8205
Fax: (775) 851-8593

Field Report

Client:
CME, Inc.
300 Sierra Manor Drive, Suite 1
Reno, NV 89511

Project:
1058
CME Small Projects
Varies
Varies, NV

GENERAL INFORMATION

Activity Date: 06/19/2025

Contractor: Innovated Construction Soulutions

Weather: Sunny

Temperature: 90

Location Details:
2095 E. Newlands Dr. Fernley, Nv. retaining pond

THE FOLLOWING WAS NOTED

Arrived onsite at the request of the client to perform compaction testing on the native subgrade at the retaining pond floor elevation. Three compaction tests were conducted on the brown fine silty sand using a Troxler 3430 nuclear density gauge. The contractor indicated that a minimum compaction of 90% dry density was required; however, initial test results did not meet this specification when evaluated against the supplied curve. It was observed that the moisture content of the material was very low and not within optimal conditions for compaction. The contractor informed me that they planned to soak the material to allow water to percolate through the sand and would implement additional compaction efforts using a smooth drum compactor, requesting CME to return the following day for retesting. It was later determined that the original curve provided was incorrect, and upon recalculating the results with the revised curve, the previously tested material met the required 90% dry density specification. The updated curve was applied to the three tests performed, and results were recorded accordingly. Refer to the density section for detailed test results and locations.

Photos

Photo Description:
Smooth drum compactor used for compaction efforts

Photo Description: Retaining pond looking south west

Reviewed By: Seymour, Ben

CME Representative: Hicks, Sean

CME CONSTRUCTION MATERIALS ENGINEERS, INC.
300 Sierra Manor Dr. Suite 1
Reno, NV 89511
Phone: (775) 851-8205
Fax: (775) 851-8593

Field Report

Client:	Project:
CME, Inc. 300 Sierra Manor Drive, Suite 1 Reno, NV 89511	1058 CME Small Projects Varies Varies, NV

Soil Nuclear Gauge - 1058_2025-06-19_Hicks, Sean

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

300 Sierra Manor Dr. Suite 1
Reno, NV 89511
Phone: (775) 851-8205 | Fax: (775) 851-8593

Soil Nuclear Gauge

Report Date: 06/27/2025
Test Method: ASTM D 6938

Client:
CME, Inc.
300 Sierra Manor Drive, Suite 1
Reno, NV 89511

Project:
1058
CME Small Projects
Varies
Varies, NV

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	In Place Wet Density (pcf)	Probe Depth (in)	Percent Compaction	Min/Max Comp. (%)	Remark
39		06/19/25	Fernley Pond Subgrade - Native		UN	15.0	120.8	3.8	118.7	123.2	10	98	90 / 100	DP/MF
40		06/19/25	Fernley Pond Subgrade - Native		UN	15.0	120.8	3.4	110.8	114.6	10	92	90 / 100	DP/MF
41		06/19/25	Fernley Pond Subgrade - Native		UN	15.0	120.8	4.1	108.7	113.2	10	90	90 / 100	DP/MF

Test Information

Test #	Test Location	Elevation	Reference	Gauge Specs Make / Model / SN / Calibrated	Gauge Standardization Density Standard/Moisture Standard	Field Technician
39	Subgrade Native: 2095 E. Newlands Dr. Fernley, Nv. retaining pond center of NW quadrant		FSG retaining pond floor	Troxler / 3430 / 20010 / 05/16/2024	1372 / 553	Hicks, Sean
40	Subgrade Native: 2095 E. Newlands Dr. Fernley, Nv. retaining pond center of SW quadrant		FSG retaining pond floor	Troxler / 3430 / 20010 / 05/16/2024	1372 / 553	Hicks, Sean
41	Subgrade Native: 2095 E. Newlands Dr. Fernley, Nv. retaining pond center of SE quadrant		FSG retaining pond floor	Troxler / 3430 / 20010 / 05/16/2024	1372 / 553	Hicks, Sean

Remarks	Comments
DP/MF: Density Pass / Moisture Fail	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

EL=4127.27
EL=4124.18
EL=4127.29
EL=4124.37
EL=4124.39
EL=4127.51
EL=4127.46
EL=4124.40
EL=4126.63
EL=4126.38
EL=4120.39
EL=4126.61
EL=4120.52
EL=4122.68
EL=4124.33
EL=4124.33
EL=4120.50
EL=4120.52
EL=4126.31
APPROXIMATE EDGE OF POND LINER
EL=4122.94
EL=4120.51
EL=4120.52
EL=4123.69
EL=4124.30
EL=4120.64
EL=4120.33
EL=4123.78
EL=4120.61
EL=4123.94
EL=4124.27
EL=4122.90
EL=4123.40
EL=4120.72
EL=4120.60
EL=4124.01
EL=4120.57
EL=4124.37
EL=4124.25
EL=4122.75
EL=4124.91
EL=4124.36
EL=4124.44

4127 4126 4125 4124 4123 4122 4121

RICHARD L PHELPS
PROFESSIONAL LAND SURVEYOR - STATE OF NEVADA
No. 32875
Exp: 2025-12-31

SURVEYOR'S STATEMENT

THIS PLAT IS TO ILLUSTRATE A SURVEY OF A LINED STORM WATER DETENTION BASIN AT CLEAN EARTH, A HAZARDOUS WASTE RECYCLING FACILITY, 2095 W. NEWLANDS DR E, FERNLEY, NV. 89408 CONDUCTED 2025-06-25 UNDER MY DIRECT SUPERVISION.

BASIS OF BEARINGS AND ELEVATION

ARE BASED ON THE NEVADA STATE PLANE COORDINATE SYSTEM , WEST ZONE NAD 83(2011) GRID AND GEOID 12A NV WEST.

Robison Engineering COMPANY, INC
846 VICTORIAN AVENUE
SPARKS, NV 89431
www.robisoneng.com

DRAWN:ARD
DATE:2025-06-25

PREPARED FOR:
INNOVATIVE CONSTRUCTION SERVICES
575 ANTON BLVD
STE 850
COSTA MESA, CA

N
0' 10' 20'
SCALE: 1"=20'
CI = 1'

STORMWATER POND AS-BUILT SURVEY

FERNLEY NV
PROJECT NO:1.2984.01.001

FLUSH THREAD PVC SCREEN AND CASING

- ✓ Monoflex CNC computer lathed flush threads follow ASTM F-480 recommendations for reliable, consistent results on the job site.
- ✓ Our close tolerances provide a strong connection while retaining ease of assembly.
- ✓ Manufactured from quality PVC pipe, Monoflex flush thread screens and casings are available in diameters of 1/2" through 16" with 2, 4, or 8 threads per inch in Sch. 40 & Sch. 80. Other schedules and SDR's are available in PVC and high density polyethylene.
- ✓ Lengths are measured as "laying length", (not including male thread length), in 2" and 4" diameters, Sch. 40 and Sch. 80 and 6" Sch. 80. All other diameters and schedules are measured end to end. Custom lengths are available in all diameters.
- ✓ All standard Monoflex PVC threads are compatible with other materials threaded to ASTM F-480 recommendations, with the same TPI. **Note**: Threads on 14" and 16" Monoflex screens and casings are not ASTM F-480 as the flush thread guideline does not specify pipe diameters larger than 12".
- ✓ All standard screens provide maximum net open area. A wide variety of slot sizes and spacings are available to adapt to various site conditions and applications.
- ✓ 1/2" through 6" Sch. 40 and Sch. 80 screens and casings are provided with Buna-N O-rings. O-rings may be installed or packaged separately depending on size. O-rings for all other sizes and schedules are sold separately. Please specify if O-rings are required when placing order.
- ✓ All flush thread screens and casings are Envirowrapped and hermetically sealed at both ends as a standard practice.

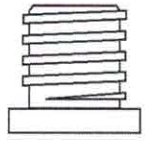
The following pages list flush thread PVC screens and casings along with the appropriate Buna-N O-rings, and flush thread caps, plugs, and points. Custom lengths, threads and adapters are available.

Please specify part number when ordering.

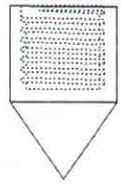
Flush Thread Casing

Flush Thread Screen

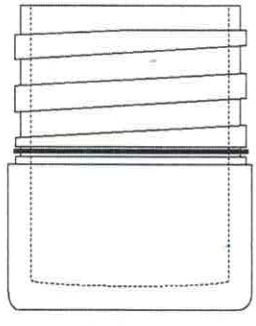
Female Cap (solid)



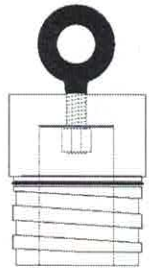
Male Plug (solid)



Female Point (solid)



Male Plug (molded)



Hoist Plug (solid)

ENGINEERING SPECIFICATIONS

PVC FLUSH THREAD MONITOR WELL SCREENS AND CASINGS

1. All PVC well screens and casings used on this project shall be manufactured by Monoflex and follow recommendations of ASTM F-480: "Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80."
2. PVC materials used to produce the raw PVC pipe shall meet ASTM Standard D-1784: "Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for PVC Normal Impact, Type I Grade I (1120), cell classification 12454-B."
3. The finished schedules 40, 80, and 120 raw pipe shall meet the requirements of ASTM Standard D-1785: "Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120." In addition, both the raw material and the finished raw pipe shall be approved by the National Sanitation Foundation (NSF) for use in potable water applications.
4. The PVC pipe used to produce the well screens and casings shall be made from virgin plastic produced by the original compounder.
5. The pipe shall be homogeneous throughout and essentially uniform in color, opacity and density. The inside and outside surfaces shall be glossy in appearance and free of chalking, sticky or tacky material and visually free of oils, grease, dust and marks imparted as a result of the manufacturing process. In addition the pipe walls shall be free of ink, cracks, holes, blisters, voids, foreign inclusions, or other defects that are visible to the naked eye and that may affect the wall integrity. Machined slots or holes deliberately placed in the pipe are acceptable.
6. The outside diameters, wall thicknesses and out of roundness tolerances shall fall within the guidelines of Tables 1 & 2 of the ASTM F-480 Standard Specification when measured in accordance with Test Method D-2122.
7. All flush thread materials must be slotted and threaded without the use of any type of liquid coolant. Air is the only acceptable coolant.
8. Well screens 1/2" through 5" are to be slotted on 1/8" spacing. Well screens 6" and larger are to be slotted on 1/4" spacing unless otherwise specified. ALL well screens .040 slot and larger will be slotted on 1/4" spacing unless otherwise specified.
9. All screens and casings shall be nominal length except for 2" and 4" sch. 40 and 6" sch. 80 which shall be laying length. The term "laying length" refers to the overall length less the length required to complete the assembly.
10. The threads per inch for the various diameters and schedules of flush thread materials shall be the same as that produced by Monoflex, Bechtelsville, Pennsylvania or approved equal.
11. All flush thread screens & casings shall be supplied in individual polyethylene bags hermetically sealed at BOTH ends. Said products shall be shipped in cardboard boxes with properly secured ends. Each box shall display a color coded label containing a full description of the product inside. Said label must indicate the number of pieces per box, the threads per inch, the date of packaging, the signatures of the packer and QC inspector and show a drawing of the product.

HDPE / LLDPE Installation Manual

ECApplications

Rev 1/2019

Table of Contents

Part 1 – General

1.1 Scope

This manual is intended to describe the requirements for the installation of High Density Polyethylene (HDPE) or Liner Low Density Polyethylene (LLDPE) geomembranes. This manual complements, does not replace, applicable project specifications.

1.2 Standard Test Methods

ASTM D 6392: Standard Test Methods for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo Fusion Methods

ASTM D 5820: Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes

ASTM D 5641: Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber

GRI Standard GM9: Standard Practice for Cold Weather Seaming of Geomembranes

GRI Standard GM14: Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes

GRI Standard GM19a: Seam Strength and Related Properties of Thermally Bonded Homogeneous Polyolefin Geomembranes

GRI Standard GM19b: Seam Strength and Related Properties of Thermally Bonded Reinforced Polyolefin Geomembranes

1.3 Submittals

Prior to installation of geomembrane, ECA shall provide the following submittals (As Required) –

A. Geomembrane Manufacturers Certificates

B. Proposed Panel Layout

C. HDPE / LLDPE Installation Manual

D. Crew Resumes
   - Superintendent(s)
   - Master Seamer(s)
   - Quality Control Technician(s)

E. Sample Material Warranty

F. Sample Installation Warranty

1.4 Material Delivery, Storage and Handling

A. Each roll of geomembrane delivered shall be labeled by the manufacturer. The label shall be firmly affixed and shall clearly state the manufacturer's name, product identification, material thickness, roll number and roll dimensions.

B. Geomembrane shall be protected from mud, dirt, dust, puncture, ponding water, cutting, traffic or any other damaging or deleterious conditions.

C. Geomembrane shall be stored on a level prepared surface that will support geomembrane rolls evenly.

D. Geomembrane delivered to the site shall be cross-referenced with Bills of Lading and approved Geomembrane Manufacturer's Certificates.

E. Any geomembrane rolls that show any visible damage shall be marked and documented. Damaged rolls shall be stored separate for further evaluation.

F. Rolls should be stored in a manner that prevents sliding or rolling which can be accomplished by the use of chock blocks or similar. Rolls should be stacked no higher than the height at which they can be safely handled (typically no higher than three layers).

1.5 Pre-Construction Meeting

A. A geomembrane pre-construction meeting shall be held at the project location prior to the installation of the geomembrane. At a minimum, the meeting shall be attended by ECA, Owner, Owner's Representative (Engineer and/or CQA Firm), and the Earthwork's Contractor.

B. Topics for the meeting:

1. Health & Safety
2. Lines of Communication and Authority
3. Schedule
4. Roles and Responsibilities of each party

Part 2 - Installation

2.1 Subgrade Preparation

A. The subgrade shall be prepared in accordance with the project specifications. The geomembrane subgrade shall be uniform and free of sharp or angular objects that may damage the geomembrane.

B. The subgrade surface shall be smooth, firm and unyielding. Providing a capable foundation for the geomembrane.

C. ECA and Owner's Representative shall provide daily written acceptance for the surface covered by the geomembrane during that day's installation.

D. It shall be the installer's responsibility to inform the Owner, Owner's Representative or Earthworks Contractor of any change in the condition of the subgrade that could cause the subgrade to be out of compliance with this section.

2.2 Deployment

A. Unroll geomembrane using methods that will not damage geomembrane and will protect underlying surface from damage.

B. In general, seams shall be oriented parallel to the line of the maximum slope. Try to minimize seams in corners or odd geometric locations. Deploy panels to minimize risk of in-place damage (EX. – High to Low).

C. Place temporary ballast on the geomembrane that will not damage the geomembrane and prevent wind uplift. The use of sandbags or equivalent ballast can be used.

D. Each panel deployed will be assigned a unique panel number along with the manufacturers roll number.

E. Personnel and Equipment shall not damage geomembrane during transportation, handling or installation.

F. Smoking is not permitted on the geomembrane.

G. Geomembrane deployment shall not take place in the presence of moisture/precipitation or excessive wind.

H. The use of low ground pressure, rubber tired ATV or tracked equipment, may be utilized and is acceptable if contact pressure is less than or equal to 8 PSI.

I. For geomembrane deployment under 32 degrees F please reference GRI Standard GM9.

2.3 Anchorage

A. As required by the project drawings or specifications, the end of the geomembrane shall be placed in an anchor trench at the top of the slope or an equivalent runout design shall be utilized.

B. When utilizing an anchor trench design, the front edge of the trench should be rounded so as to eliminate and sharp corners. Loose soil should be removed or compacted into the floor of the trench.

2.4 Seaming Methods – Equipment

Approved process for seaming are single or double wedge fusion welding for general seaming and extrusion welding for patching, repairs or detail work.

A. Fusion Welding: The seam shall be produced by a self-propelled wedge welding apparatus. The apparatus shall be equipped with gauges to monitor weld temperature. All welding surfaces shall be kept clean and dry.

B. Extrusion Welding: The seam shall be produced by extruding molten resin at the edge of two overlapped sheets of geomembrane. The extrusion apparatus shall be equipped with gauges to monitor extrudate temperature. The extruder shall be purged of all degraded or cooled extrudate prior to the commencement of each seaming sequence.

2.5 Qualification (Start-Up) Seaming

A. Qualification Seaming shall be made to verify that seaming parameters are adequate at the beginning of each seaming period and approximately every 4 hours during field seaming. (Speed, Temperature, Machine Pressure, Welding Technician)

B. Qualification Seaming shall be performed under the same conditions as field seaming will occur.

C. The qualification seam shall be approximately six (6) feet in length with the seam centered lengthwise.

D. Equipment for testing qualification seams shall consist of a coupon cutter which shall cut one (1) in wide coupons and a calibrated field tensiometer with digital readout.

E. Six one (1) in wide coupons shall be cut from the qualification seam with the seam centered perpendicular in the coupon.

F. Four (4) coupons will be tested for peel and two (2) coupons will be tested for shear on a calibrated field tensiometer.

G. The values shall meet or exceed the minimum acceptable seam strength values listed in GRI Standard GM19a or GM19b.

H. Should a qualification seam fail, additional testing shall be conducted. If additional qualification seam testing fails, welding apparatus shall be rejected until deficiencies can be corrected and a successful qualification seam can be produced.

2.6 Field Seaming

A. Fusion Welding

1. Geomembrane seams shall have an overlap of 4 – 6 inches. Excess overlap shall be trimmed prior to seaming.

2. Seam area shall be prepared by wiping with a clean dry cloth to remove any moisture and foreign matter.

3. Welding technicians shall record their initials, date, time, machine number, machine speed and machine temperature at the beginning of every seam. Machine speed and machine temperature shall also be marked periodically, approximately 100' intervals, along the seams and at the end of seams.

4. For geomembrane seaming under 32 degrees F please reference GRI Standard GM9.

B. Extrusion Welding

1. Geomembrane seams shall have an overlap of at least 6 inches.

2. Seam area shall be prepared by wiping with a clean dry cloth to remove any moisture and foreign matter.

3. Seam is properly heat tacked prior to abrading and welding.

4. Seam is properly abraded to remove any oxidation and foreign contaminants. Care should be taken not to over abrade the seam.

5. The extrusion welder shall be purged of all degraded or cooled extrudate prior to the commencement of each seam.

6. Welding technicians shall record their initials, date, time, machine number and machine temperature on each patch.

7. For geomembrane seaming under 32 degrees F please reference GRI Standard GM9.

Part 3 – Quality Control

3.1 Non-Destructive Testing

All field seam shall be non-destructively tested over their entire length using air pressure for double fusion weld or vacuum test for extrusion weld.

A. Air Pressure Test

1. Equipment shall consist of air tank or pump and sharp needle with pressure gauge.

2. Seal both ends of the seam by heating and squeezing them together.

3. Insert needle with pressure gauge at one end of the seam into air channel.

4. Pressurize air channel to approximately 30 PSI and let stabilize. Sustain pressure for a minimum of 5 minutes. If pressure drop does not exceed more than 3 PSI then test is successful.

5. Testing technician shall record their initials, date, start time, beginning pressure, end time and ending pressure next to the seam being tested.

6. At the end of the test duration, cut the opposite end of the seam from the needle with pressure gauge and listen for pressure release to verify entire length of seam was tested.

7. If the test fails, walk the seam while under pressure and listen for a leak. Once leak is located, repeat steps 2 – 6 until all sections of the seam have passed.

8. Repair faulty areas and vacuum test.

B. Vacuum Test

1. Equipment shall consist of a vacuum box with clear viewing window, vacuum pump and a soapy water solution.

2. Wet an area of the seam to be tested with the soap water solution and place vacuum box over wetted area.

3. Energize vacuum pump to generate a seal between the gasket and the geomembrane. Ensure seal before proceeding.

4. Observe the seam through the viewing window for the presence of soap bubbles.

5. If no bubbles are observed move to the next section of the seam overlapping previously tested area to ensure entire seam is tested.

6. If bubbles are observed, mark area for repair and re-test per steps 2 – 6 until seam has passed.

3.2 Destructive Testing

Destructive sampling is necessary in verifying the effectiveness of the welding process. Obtaining destructive samples from the geomembrane system is damaging, and even when done properly, may result in a geomembrane system that is weaker and less effective. Everything that can be done to remove the destructive sample locations from within the geomembrane system should be done. For example, taking destructive samples from runouts, anchor trenches or creating representative samples. Ideally destructive samples should be taken at as low a frequency as possible, within flat areas where the impact of the hole in the liner can be minimized.

A. Destructive seam testing shall be performed to evaluate bonded seam strength. The frequency of sample removal shall be one sample per 500 linear feet of welded seam or another predetermined length in accordance with GRI standard GM14.

B. Destructive sample locations will be determined by the Owner or Owner's Representative.

C. Destructive samples shall be numbered in numerical order and tested as soon as possible after seam is completed.

D. Destructive samples should be labeled with the sample number, date seam was welded, welding technician initials, welding machine number, welding temperature and seam number. Also include welding machine speed if seam was a fusion weld.

E. The size of the destructive samples shall be a minimum of three (3) feet in length and twelve (12) inches in width. The samples should be distributed as follows –

   1. 12 in x 12 in piece to ECA QC Technician for field testing.

   2. 12 in x 12 in piece to Owner or Owners Representative for third party testing.

   3. 12in x 12 in piece to project archive.

F. Equipment for testing destructive samples shall consist of a coupon cutter which shall cut one (1) in wide coupons and a calibrated field tensiometer with digital readout.

G. Ten (10) coupons shall be cut from the sample for field testing. Five (5) coupons shall be tested for peel meeting or exceeding the minimum acceptable seam strength values listed in GRI standard GM19a or GM19b. The remaining five (5) coupons shall be tested for shear which shall meet or exceed the minimum acceptable seam strength values listed in GRI Standard GM19a or GM19b.

H. Seams must exhibit film tear bond (FTB) with < 25% incursion into the weld. Exclusive of Separation in Plane (SIP).

I. When documenting fusion weld peel values on the appropriate form, indicate the outside track first followed by the inside track.

J. If a destructive sample fails, additional samples shall be cut approximately ten (10) feet on both sides of the failed test and retested. These samples shall be marked A (After) & B (Before). This procedure shall repeat itself until a destructive sample passes. The area between passing samples shall be reconstructed or replaced and non-destructively or destructively tested as appropriate.

3.3 Repairs

Any portion of the geomembrane that exhibits a defect and has been marked for repair may be repaired with one of the following methods.

A. Patch – used to repair a localized hole, T-Joint, materials defects or abrasion.

B. Spot Welding (Bead) – used to repair localized abrasion, scratch or material defects.

C. Cap – used to repair failed seams.

D. Flap Welding – used to extrusion weld flap of a fusion weld in lieu of a cap.

E. Replacement Seam – used to replace a failed seam in lieu of capping or flap welding.

Appendix A

Sample Quality Control Forms

ECApplications
Seam Control Form

Project Name: _____ Job # _____ Superintendent: _____

Material Type: _____ Primary _____ Pond -

Job Description: _____ Secondary _____ Cell -

Reported By _____ Pad -

Air Pressure Test _____ PSI

Air Pressure Hold Time _____ Minutes

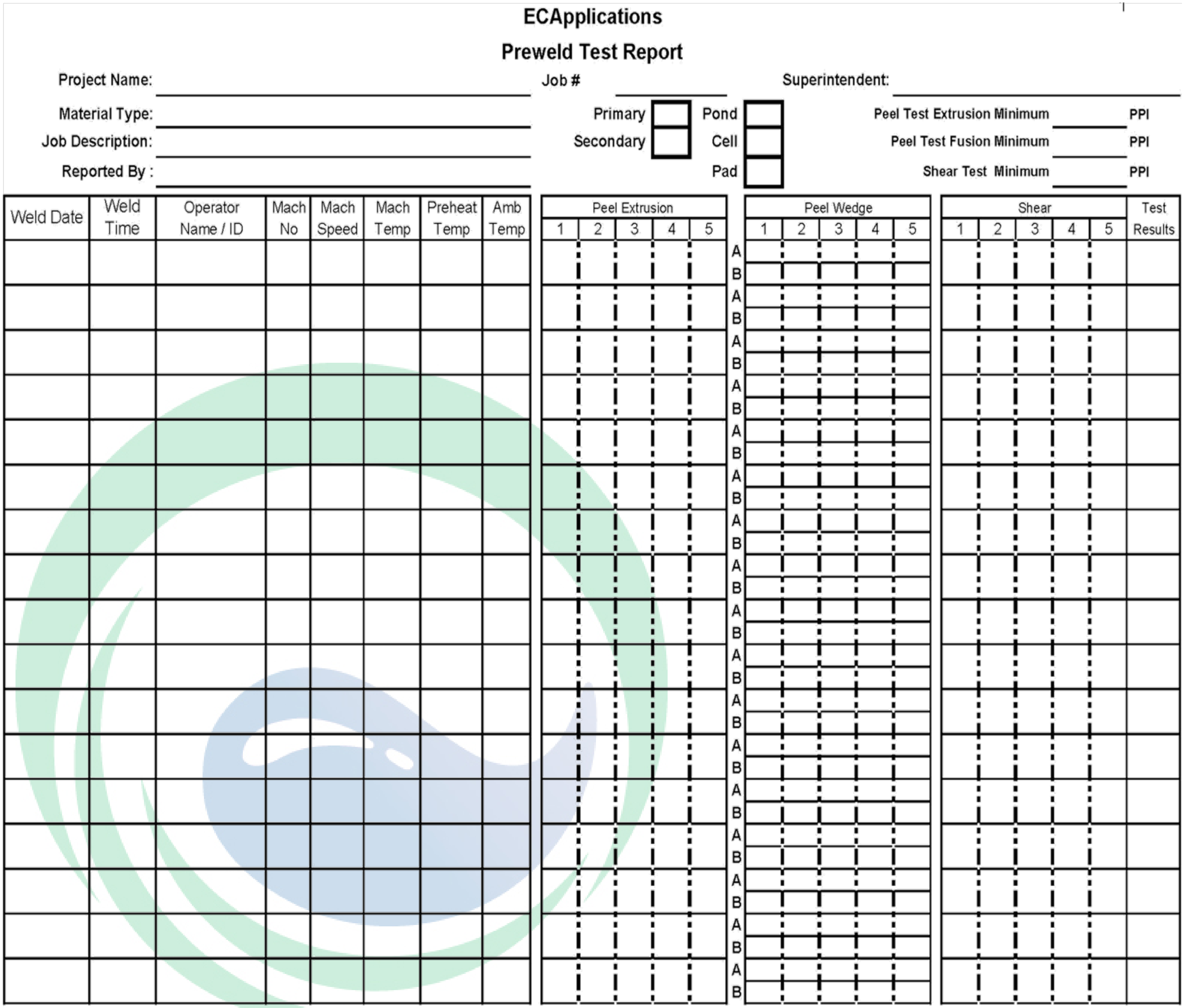
Allowable Air Pressure Loss _____ PSI

- Total LF of Welding to Date Combined

Extrusion LF Weld Total To Date -

Fusion LF Weld Total To Date -

Weld Date	Seam Number	Seam Length	Weld Time	Operator Name / ID	Mach Number	Mach Speed	Mach Temp	Preheat Temp	Ambient Temp	Test Date	Test Type	PSI IN	Time (Mins)	PSI OUT	PSI Loss	Test Results



ECApplications

Preweld Test Report

Project Name: ____________________ Job # __________ Superintendent: ____________________

Material Type: ____________________

Primary ☐ Pond ☐

Secondary ☐ Cell ☐

Pad ☐

Job Description: ____________________

Reported By : ____________________

Peel Test Extrusion Minimum ______ PPI

Peel Test Fusion Minimum ______ PPI

Shear Test Minimum ______ PPI

Weld Date	Weld Time	Operator Name / ID	Mach No	Mach Speed	Mach Temp	Preheat Temp	Amb Temp	Peel Extrusion						Peel Wedge					Shear					Test Results
								1	2	3	4	5		1	2	3	4	5	1	2	3	4	5	
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											
													A											
													B											

ECApplications

Destructive Sample Information

Project Name: ______________________ Job # __________ Superintendent: ______________

Material Type: ______________________ Primary ☐ Pond ☐ Peel Test Extrusion Minimum ________ PPI

Job Description: ______________________ Secondary ☐ Cell ☐ Peel Test Fusion Minimum ________ PPI

Reported By : ______________________ Pad ☐ Shear Test Minimum ________ PPI

DS No	Seam Number	Weld Date	Operator Name / ID	Mach No	Mach Speed	Mach Temp	Preheat Temp	Amb Temp	Peel Extrusion						Peel Wedge					Shear					Test Result
									1	2	3	4	5		1	2	3	4	5	1	2	3	4	5	
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											
														A											
														B											

ECApplications
Repair Report

Project Name - Job # : Superintendent:

Material Type: Primary Pond

Job Description: Secondary Cell

Reported by : Pad

Damage Codes				
CR --Crease	FS --Failed Seam	MatD --Material Defect	LL --Lost Lap	CF --Custom Fit
DS --Destruct Sample	WR --Wrinkle	WS --Welder Restart	MD --Mechanical Damage	PB --Pipe Boot
SI --Subgrade Irregularity	AV --Airvent	RW --Roller Wrinkle	DO --Damage By Others	BO --Burn Out
SJ --Seam Joint	AO --Add On	CS --Concrete Structure		AT --Air Test

SF Patch Material
LF Welded

Test Type	Abbrv.	Repair Types
Vacuum	*S=South	C--Cap Strip
Air Pressure	*N=North	P--Patch
Spark	*W=West	B--Extrusion Bead
Air Lance	*E=East	

Repair Number	Damage Code	Seam Number	Panel Number	Location	Repair Type	Patch (Feet)			Bead (Inches)	Date Welded	Operator Name	Machine Number	Test Type	Test Results	Date Complete
1							x								
2							x								
3							x								
4							x								
5							x								
6							x								
7							x								
8							x								
9							x								
10							x								
11							x								
12							x								
13							x								
14							x								
15							x								
16							x								
17							x								
18							x								
19							x								
20							x								
21							x								

Panel Placement Log

Project Name: _____ Job # _____

Superintendent: _____ Primary [ ] Cell [ ]

Material Type: _____ Secondary [ ] Pond [ ]

Description: _____ Pad [ ] Depth & Width of AT _____

Roll Stock Width _____

Panel #	Roll Stock #	Deploy Date	Initial Width 1 (Angle)	Initial Side 1 Length (Angle)	Initial Width 2	Initial Side 2 Length	Width 1 (Angle)	Side 1 Length (Angle)	Width 2	Side 2 Length	LF in Trench	Panel Total SF	SF In Trench	Total SF (Pay Area)
Totals to Date												-	-	-
1					-	-	-	-	-	-	-	-	-	-
2					-	-	-	-	-	-	-	-	-	-
3					-	-	-	-	-	-	-	-	-	-
4					-	-	-	-	-	-	-	-	-	-
5					-	-	-	-	-	-	-	-	-	-
6					-	-	-	-	-	-	-	-	-	-
7					-	-	-	-	-	-	-	-	-	-
8					-	-	-	-	-	-	-	-	-	-
9					-	-	-	-	-	-	-	-	-	-
10					-	-	-	-	-	-	-	-	-	-
11					-	-	-	-	-	-	-	-	-	-
12					-	-	-	-	-	-	-	-	-	-
13					-	-	-	-	-	-	-	-	-	-
14					-	-	-	-	-	-	-	-	-	-
15					-	-	-	-	-	-	-	-	-	-
16					-	-	-	-	-	-	-	-	-	-
17					-	-	-	-	-	-	-	-	-	-
18					-	-	-	-	-	-	-	-	-	-
19					-	-	-	-	-	-	-	-	-	-
20					-	-	-	-	-	-	-	-	-	-
21					-	-	-	-	-	-	-	-	-	-
22					-	-	-	-	-	-	-	-	-	-
23					-	-	-	-	-	-	-	-	-	-
24					-	-	-	-	-	-	-	-	-	-
25					-	-	-	-	-	-	-	-	-	-
26					-	-	-	-	-	-	-	-	-	-
27					-	-	-	-	-	-	-	-	-	-
28					-	-	-	-	-	-	-	-	-	-
29					-	-	-	-	-	-	-	-	-	-
30					-	-	-	-	-	-	-	-	-	-
31					-	-	-	-	-	-	-	-	-	-
32					-	-	-	-	-	-	-	-	-	-
33					-	-	-	-	-	-	-	-	-	-

Appendix B

Sample Installation Warranty

ECA STANDARD 1 YEAR LIMITED WARRANTY

PROJECT:	**SAMPLE**	**OWNER:**	**-**
LOCATION:	**-**	**CONTRACT AMOUNT:**	**-**
		COMPLETION DATE:	**-**

EROSION CONTROL APPLICATIONS, INC. ("EC Applications / ECA"), subject to the terms and conditions set forth below, warrants the above referenced installation shall be installed free from defects in workmanship for a period of one (1) year from the date the installation is completed. This LIMITED WARRANTY extends only to the proper installation of the lining system and does not include damages or defects in the installation caused by entities other than ECA or resulting from Acts of God, or casualty, or catastrophe, including but not limited to, earthquakes, fire, floods, hail, tornados, hurricanes, tropical storms, gale force winds, other events of force majeure or vandalism. Further, this LIMITED WARRANTY does not include damages or defects in the installation resulting from exposure to harmful chemicals, abuse by machinery, equipment or people, excessive pressures or stresses from any source, subsurface or overburdened soil conditions, total or differential soil settlements, or any other cause not within ECA's control.

The extent of ECA's liability for breach of this LIMITED WARRANTY shall be limited to repairing or replacing the defective installation workmanship that will result in providing the OWNER with the pro-rated performance remaining under the original period of this LIMITED WARRANTY. ECA shall have the right to inspect and determine the cause of any alleged defect in the installation and to take appropriate steps to repair or replace the installation workmanship if a defect exists and is within the terms of this LIMITED WARRANTY.

This LIMITED WARRANTY will not be effective unless ECA receives written notice, by certified mail, to the PRESIDENT of EROSION CONTROL APPLICATIONS, INC. within ninety (90) days after the alleged defect is first discovered, or should have been discovered by the OWNER. Should the required notice not be given, the defect and all warranties shall be deemed to have been waived by OWNER, and OWNER shall have no right of recovery against ECA. In the event repairs or replacement are to be effected, said repairs and/or replacements shall not become due until the area subject to repair or replacement is made available to ECA in a clean, dry and unencumbered condition. This includes, but is not limited to, the repair or replacement area being free from all water, dirt, sludge, waste, residuals, liquids, or overlying material of any kind. In no event will ECA be liable for any costs expended by any person or entity other than ECA on any defective work with respect to the installation. Any repairs, replacements or alterations which affect ECA's original installation work will VOID this LIMITED WARRANTY.

Notwithstanding anything herein to the contrary, ECA's liability under this LIMITED WARRANTY shall in no event exceed the Contract Amount above state. Further, under no circumstances shall EROSION CONTROL APPLICATIONS, INC. be liable for any special, direct, indirect or consequential damages arising from loss of production or product, or any other losses, including losses due to personal injuries and product liability owing to the failure of the material or installation. OWNER shall be deemed to have waived its rights under this LIMITED WARRANTY with respect to any repairs, replacements or alterations made by OWNER without the express written consent of EROSION CONTROL APPLICATIONS, INC.

EROSION CONTROL APPLICATIONS, INC. neither assumes nor authorizes any person other than an officer of ECA to assume for it any other or additional liability in connection with the installation. This LIMITED WARRANTY is extended to the property OWNER only. No rights against ECA will survive an attempted transfer or assignment to any party who does not own the property.

The LIMITED WARRANTY herein is given in lieu of all warranties of merchantability, fitness for purpose, or other warranties or representatives, expressed or implied. By accepting the installation, OWNER waives all other such possible warranties or representations, except those specifically given herein. Correction of nonconformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of ECA to OWNER, whether based on contract, negligence, strict liability or otherwise with respect to or arising out of the installation of the lining system. The parties hereto expressly agree that the sale hereunder is for commercial or industrial use only. Warranties, if any, concerning the materials incorporated into the lining system are covered, if at all, by separate warranties from the manufacturers or suppliers of such materials and are expressly excluded from the scope of this LIMITED WARRANTY, and OWNER acknowledges and agrees that ECA has made no warranties or representations to it concerning either the availability or sufficiency of any such warranties or representations from manufacturers or suppliers.

Except as expressly stated above, EROSION CONTROL APPLICATIONS, INC. makes no warranty of any kind and hereby disclaims all warranties with respect to the installation of the lining system, both expressed and implied, including, but not limited to, implied warranties or merchantability and fitness for a particular purpose.

No terms or conditions other than those stated herein and no agreement or understanding, oral or written, and no course of conduct or performance in any way purporting to modify this LIMITED WARRANTY or to waive ECA's rights hereunder shall be binding on ECA unless the same shall be clearly described in writing that refers to this LIMITED WARRANTY and is signed by an officer of ECA. Additional liabilities created by other documents shall have no force or effect upon this LIMITED WARRANTY or the installation performed by ECA. The laws of the STATE OF CALIFORNIA will govern the rights and duties of the parties under this LIMITED WARRANTY.

EROSION CONTROL APPLICATIONS, INC.:

BY: _____ **TITLE:** _____

SIGNED: _____ **DATED:** _____

Smooth Liner®

HIGH DENSITY POLYETHYLENE

PRODUCT DATA

Property	Test Method	Frequency	Minimum Average Values				
Thickness (minimum avg), mil (mm)	ASTM D5199	Per Roll	30 (0.75)	40 (1.0)	60 (1.5)	80 (2.0)	100 (2.5)
Thickness (minimum), mil (mm)			27 (0.68)	36 (0.9)	54 (1.35)	72 (1.8)	90 (2.25)
Density, g/cc, minimum	ASTM D792, Method B	200,000 lb	0.94	0.94	0.94	0.94	0.94
Tensile Properties (both directions)	ASTM D6693, Type IV						
Strength @ Yield, lb/in width (N/mm)	2in/minute	20,000 lb	66 (11.6)	88 (15.4)	132 (23.1)	176 (30.8)	220 (38.5)
Elongation @ Yield, % (GL=1.3 in)			12	12	12	12	12
Strength @ Break, lb/in width (N/mm)			120 (21)	160 (28)	240 (42)	320 (56)	400 (70)
Elongation @ Break, % (GL=2.0 in)			700	700	700	700	700
Tear Resistance, lbs (N)	ASTM D1004	45,000 lb	22 (98)	30 (133)	45 (200)	60 (267)	72 (320)
Puncture Resistance, lbs (N)	ASTM D4833	45,000 lb	60 (267)	80 (356)	120 (534)	160 (712)	190 (845)
Carbon Black Content, % (range)	ASTM D4218	20,000 lb	2 - 3	2 - 3	2 - 3	2 - 3	2 - 3
Carbon Black Dispersion (Category)	ASTM D5596	45,000 lb	Only near spherical agglomerates: 10 views Cat. 1 or 2				
Stress Crack Resistance (SP NCTL), hrs.	ASTM D5397 Appendix	200,000 lb	500	500	500	500	500
Oxidative Induction Time, minutes	ASTM D8117, 200°C, 1 atm O_2	200,000 lb	≥140	≥140	≥140	≥140	≥140

AGRU America's geomembranes are certified to pass Low Temp. Brittleness via ASTM D746 (-80°C), Dimensional Stability via ASTM D1204 (±2% @ 100°C). Oven Aging and UV Resistance are tested per GRI GM 13. These product specifications meet or exceed GRI's GM13.

SUPPLY INFORMATION (STANDARD ROLL DIMENSIONS)

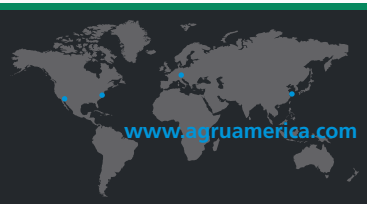
THICKNESS		WIDTH		LENGTH		AREA (APPROX.)	
mil	mm	ft	m	ft	m	ft²	m²
30	0.75	23	7	1,175	358	27,025	2,511
40	1.0	23	7	900	274	20,700	1,923
60	1.5	23	7	600	183	13,800	1,282
80	2.0	23	7	455	139	10,465	972
100	2.5	23	7	365	111	8,395	780

Note:

Average roll weight is 4,200 lbs (1,905 kg). All rolls are supplied with two slings. Rolls are wound on 6" core. Special length available upon request. Roll length and width have a tolerance of ±1%. The weight values may change due to project specifications (i.e. absolute minimum thickness or special roll length) or shipping requirments (i.e. international containerized shipments).

AGRU America, Inc.
500 Garrison Road
Georgetown, SC 29440 USA

(843) 546-0600
info@agruamerica.com
Revision Date: October 8, 2024



The Plastics Experts.

AGRU Geonet

200 MIL

AGRU America's Geonet is a high-density polyethylene drainage product that is ideal for applications such as landfill cells, detection & collection in double-lined systems, landfill caps for drainage and methane gas collection, and landscape drainage systems. AGRU's Geonet is bixial and biplanar, presenting a rib formation that allows for high flow in both machine and cross-machine directions.

GEONET COMPONENT (1)			
Property	**Test Method**	**Frequency**	**Minimum Average Values**
Thickness, mil (mm)	ASTM D5199	50,000 sf	200 (5.1)
Peak Tensile Strength MD, lbs./in. (N/mm)	ASTM D5035 / 7179	50,000 sf	45 (7.9)
Density, g/cm³	ASTM D792, Method B	50,000 sf	0.94
Carbon Black Content (%)	ASTM D4218	50,000 sf	2 - 3
Transmissivity(2), m²/sec. (gal/min/ft)	ASTM D4716	500,000 sf	2×10^{-3} (9.6)

Notes:

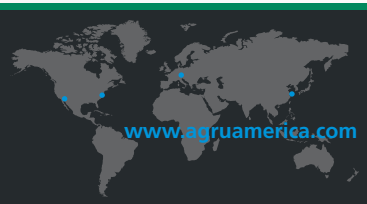
(1) Standard roll lenth is 300'.

(2) Transmissivity at 21°C, gradient of 0.1, load of 10,000 psf, seat time 15 min between steel plates.

(3) All roll widths are 14.5 feet. All roll lengths and widths have a tolerance of ±1%.

AGRU America, Inc.
500 Garrison Road
Georgetown, SC 29440 USA

(800) 373-2478 | Fax: (843) 546-0516
salesmkg@agruamerica.com
Revision Date: February 23, 2018 10:14 AM



Roll List

Customer: Erosion Control Applications Inc
Project: FERNLEY RETENTION BASIN RELINING PROJECT
Destination: PICKUP NV
Report Date: 19-May-2025 12:43 PM

S.O.# SO00026515
Item Number: FG-HDSMTH060BBBEA
Liner Type: HDPE Smooth 60mil Black Average
Roll Count: 3 (From 1 To 3) Total area 41,400 sf

#	Roll Number	Prod. Date	Width	Length	Area	Weight	Resin Lot#	3rd Party Conformance	Sample Size
1	FNB0151960003	03/20/25	23	600	13,800	4200	PRN821460	Not Required	
2	FNB0151960004	03/20/25	23	600	13,800	4170	PRN821460	Not Required	
3	FNB0151960005	03/20/25	23	600	13,800	4180	PRN821460	Not Required	

Ryan Steele, Lab Manager

For Questions, Please Contact:

Lab Manager, Fernley
Ryan Steele
775-835-8282
Ext 2015

Geomembrane Quality Certification

Customer: Erosion Control Applications Inc
Project: FERNLEY RETENTION BASIN RELINING PROJECT
Destination: PICKUP NV
Report Date: 19-May-2025 12:41 PM

S.O.# SO00026515
Item Number: FG-HDSMTH060BBBEA
Liner Type: HDPE Smooth 60mil Black Average
Roll Count: 3 (From 1 To 3)

								ASTM D5199		ASTM D8117	ASTM D792	ASTM D1238	ASTM D4218	ASTM D5596	ASTM D6693								ASTM D1004		ASTM D4833	ASTM D5397
#	Roll Number	Prod. Date	Width (ft)	Length (ft)	Area (sqft)	Weight (lb)	Resin Lot#	Thickness-Avg	Thickness-Min	OIT	Density	Melt Flow	Carbon Content	Category 1 Disp.	Tensile Yield Str (MD)	Yield Elong (MD)	Tensile Break Str (MD)	Break Elong (MD)	Tensile Yield Str (TD)	Yield Elong (TD)	Tensile Break Str (TD)	Break Elong (TD)	Tear Strength (MD)	Tear Strength (TD)	Puncture Resistance	SP-NCTL
								mil	mil	minut	g/cc	g/10	%	Categ	ppi	%	ppi	%	ppi	%	ppi	%	lb	lb	lb	hours
1	FNB0151960003	03/20/25	23	600	13800	4200	PRN821460	60	59	152	0.949	0.21	2.6	10	167	19	284	730	188	14	325	951	57	54	140	500
2	FNB0151960004	03/20/25	23	600	13800	4170	PRN821460	60	59	152	0.949	0.21	2.6	10	167	19	284	730	188	14	325	951	57	54	140	500
3	FNB0151960005	03/20/25	23	600	13800	4180	PRN821460	61	59	152	0.949	0.21	2.6	10	167	19	284	730	188	14	325	951	57	54	140	500

Ryan Steele, Lab Manager

For Questions, Please Contact:

Lab Manager, Fernley
Ryan Steele
775-835-8282
Ext 2015

CoA Date: 12/27/2024

Certificate of Analysis

Shipped To: AGRU AMERICA INC:FERNLEY
2000 Newlands Dr E
FERNLEY NV 89408-8944
USA

Recipient: PALMER
Fax:

Delivery #: 81287109
PO #: 22225
Weight: 208100.000 LB
Ship Date: 12/27/2024
Package: BULK
Mode: Hopper Car
Car #: CPCX805061
Seal No: 418458

Product:
MARLEX K307 POLYETHYLENE in Bulk

Lot Number: PRN821460

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.21	g/10min
HLMI Flow Rate	ASTM D1238	21	g/10min
Density	D1505 or D4883	0.939	g/cm3
Pellet Count	PPC-SOP-0028	23	pelet/gram
Production Date		12/22/2024	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP (CPChem).
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Steven Beck

Steven Beck
Quality Systems Coordinator

For CoA questions contact Leslie Dziamara at +1-832-813-4806-4498

Vergil H. Rhodes, PE, CPlasT - Tech Svc & App Dev Engineer, Geomembranes
Highways 60 & 123, Bartlesville Research and Technology Center, Room 103 PTC
Bartlesville, OK 74003
■ 539-529-4279 ■ rhodevh@cpchem.com ■ Fax: 918-977-7599 ■ www.cpchem.com

November 12, 2021
Filename: Agru Oven and QUV Exposure for HP-OIT Testing_2021_111221.pdf

Nathan Ivy - Corporate Quality Control/Technical Manager
Agru America, Inc.
800 Rockmead #122
Kingwood, TX 77339
281-358-4741

Dear Mr. Ivy:

Please recall your request for testing of oven-exposed and UV-exposed geomembrane samples produced primarily from Marlex® 7104 LLDPE and Marlex® K307 MDPE. Agru blended other components with each of these polyethylenes to produce the geomembrane samples for testing. Geomembrane samples have been received from Agru, and test specimens were taken from the smooth areas of the samples. Test results are reported on the following two pages. The samples were tested for HP-OIT in their as-received condition and were also tested after oven and UV exposures of 90 days and 1600 hours of irradiance, respectively, in accordance with GRI-GM13 and GRI-GM17 requirements.

The following geomembrane sheet samples were received from Agru in July 2021 and were reported to be primarily composed of each of the Chevron Phillips Chemical Company grades in the description below:

- Marlex® K307 Lot # PND821550, Agru Roll # GTC0078250016, black sheet, smooth, nominal 0.057" thick.

- Marlex® 7104 Lot # DNE810980, Agru Roll # GTA0077190117, black sheet, textured, nominal 0.055" thick.

The exposure and testing conditions along with the corresponding test results are tabulated on the next two pages. GM-13 and GM-17 require a minimum % HP-OIT retention after a 90-day oven exposure and after a 1600-hour UV irradiance exposure. These test results indicate the GM-13 and GM-17 minimum % HP-OIT retentions were exceeded by the Agru-supplied K307 and 7104 sheet samples, respectively.

If you have any questions, please feel free to contact me (contact information given above).

Sincerely,

Vergil Rhodes
Polyethylene Technical Service and Applications Development, Geomembrane

The following oven aging and UV exposure test methods were conducted in accordance with the GRI-GM13 (HDPE) and GRI-GM17 (LLDPE) requirements:

Test Name	**Exposure Conditions**	**Test Method**
Oven Aging	90 days in an oven at 85 °C	ASTM D5721
UV Exposure	1600 UV irradiance hours. Cycle: 20 hours UVA-340 at 75 °C followed by 4 hours dark with condensation at 60 °C. Irradiance was 0.78 W/m^2 at wavelength 340 nm. Note: This implies a total UV chamber residence time of 1920 hours, e.g., 1600 hours of irradiance and 320 hours of dark/condensation.	ASTM D7238
HP-OIT	150 °C in an oxygen atmosphere at 500 psi	ASTM D5885

Oven Aging Results:

Sample	Initial HP-OIT (min)	HP-OIT after 90 days of oven aging. (min)	**% HP-OIT** Retained after 90 days of oven aging.	GRI-GM13 and GRI-GM17 minimum % HP-OIT requirements after 90 days of oven aging.
K307 Lot # PND821550, Agru Roll # GTC0078250016, black sheet, smooth, nominal 0.057" thick	1313	1174	**89.4%**	GRI-GM13: % HP-OIT: 80% minimum
7104 Lot # DNE810980, Agru Roll # GTA0077190117, black sheet, textured, nominal 0.055" thick	973	802	**82.4%**	GRI-GM17: % HP-OIT: 60% minimum

Continued on Page 3 - - -

UV Aging Results:

Sample	Initial HP-OIT (min)	HP-OIT after 1600 hrs of UV exposure. (min)	**% HP-OIT** Retained after 1600 hrs of UV exposure.	GRI-GM13 and GRI-GM17 minimum % HP-OIT requirements after 1600 hours of UV exposure.
K307 Lot # PND821550, Agru Roll # GTC0078250016, black sheet, smooth, nominal 0.057" thick	1313	1053	**80.2%**	GRI-GM13: % HP-OIT: 50% minimum
7104 Lot # DNE810980, Agru Roll # GTA0077190117, black sheet, textured, nominal 0.055" thick	973	768	**78.9%**	GRI-GM17: % HP-OIT: 35% minimum

Notes:

- 1600 hours of UV exposure in accordance with ASTM D7238 implies a total UV chamber residence time of 1920 hours, e.g., 1600 hours of irradiance and 320 hours of darkness with condensation.
- Sheet samples were aged with the shiny side of the sheet facing the UV bulbs.

GEONET Quality Certification

Customer: Erosion Control Applications Inc
Project:
Destination:
Report Date: 20-May-2025 8:40 AM

S.O.# SO00026515
Item Number: FN-NET-00-200-00
Product Type: GEONET 200 MIL HD Drainage
Roll Count: 5 (From 1 To 5)

								ASTM D5199	ASTM D4218	ASTM D7179	ASTM D792	ASTM D4716
#	Roll Number	Production Date	Width (ft)	Length (ft)	Area (sqft)	Weight	Resin Lot#	Thickness	Carbon	Net Tensile	Density	Transmissivity
								mil	%	ppi	g/cc	m2/s
1	GTE0150780029	03/01/25	14.5	300	4350	785	D240922218	237	2.3	64	0.958	2.2E-3
2	GTE0150780036	03/01/25	14.5	300	4350	775	D240922218	237	2.3	64	0.958	2.2E-3
3	GTE0150780106	03/02/25	14.5	300	4350	810	D240922218	243	2.4	66	0.953	2.2E-3
4	GTE0150780131	03/03/25	14.5	300	4350	770	D240922218	243	2.2	106	0.953	2.2E-3
5	GTE0150780137	03/03/25	14.5	300	4350	750	D240922218	264	2.2	81	0.964	2.2E-3

Anthony Johnson, Vice President – Technical Services

For Questions, Please Contact:

Lab Manager, Georgetown
Serena Evans
843-546-0600
Ext 1013

Bayport Polymers LLC
12212 Port Road
Pasadena, TX 77507

DAVID HELMS
GEORGETOWN SC

SHIPPED TO:
AGRU AMERICA, INC.
C/O RJ CORMAN RAILROAD CO
171 HIGHWAY 905
MULLINS SC 29574

Quality certificate

Date
10/30/2024
Purchase order item/date
PO0000021920-5 / 09/13/2024
Delivery item/date
88183628 000001 / 09/23/2024
Order item
33509286 000001
Customer number
81136835

Material: Our / Your reference
HDPE 5502 (422107) /

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

Batch D240922218 **Quantity** 190,900 LB **Railcar** UTCX046305

Characteristic	Unit	Value
Melt Index 2.16/190	g/10 min	0.36
Density	g/cc	0.954
Railcar Prefix	-	UTCX
Railcar Number	-	046305
Railcar Seal Numbers	-	0016344

MFI 2.16/190 test method is ASTM D1238
Density test method is ASTM D792

BAYSTAR™
Bayport Polymers LLC

	Delivery item/date	Page
DAVID HELMS GEORGETOWN SC	88183628 000001 / 10/05/2024	2

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

ATTACHMENT 2
Photo Log

Clean Earth
Fernley, Nevada

=

Photo 1 – Stormwater pond pre-construction 11/11/24.

Facing northwest.

Photo 2 – Stormwater pond pre-construction 11/11/24.

Facing north.

Photo 3 – Stormwater pond pre-construction primary liner north sidewall degradation 11/11/24.

Facing north.

Photo 4 – Stormwater pond pre-construction 11/11/24.

Facing east towards the East Container Storage Area.

Photo 5 – Stormwater pond spillway 11/11/24.

Facing northeast.

Photo 6 – Stormwater pond pre-construction top of liner tear 11/11/24.

West corner near spillway.

Photo 7 – Stormwater removal of primary liner 6/17/25

Facing northeast.

Photo 8 – Stormwater removal of primary liner 06/16/25.

Looking east.

Photo 9 – Stormwater pond after old liner removal 6/17/25

Facing north.

Photo 10 – Stormwater pond after old liner removal 6/17/25.

Facing southeast.

Photo 11 – Stormwater pond grading 6/18/25

Facing east.

Photo 12 – Stormwater pond grading 6/18/25

Facing south towards the East Container Storage Building.

Photo 13 – Stormwater pond grading 6/18/25.

Facing west towards the main building.

Photo 14 –Stormwater pond wetting of sand for compaction testing 6/19/25.

Facing east.

Photo 15 — Stormwater pond grading prior to trenching for liner anchoring.

Facing south towards the East Container Storage Building.

Photo 16 – Stormwater pond trenching for liner anchoring.

Facing southeast.

Photo 17 – Stormwater pond leak detection piping (4 inch diameter schedule 40 PVC with 10 feet of 0.020 slot screen bedded in pea gravel) prior to covering with primary liner.

West corner of pond.

Photo 18 – Stormwater pond trenching for anchoring of liners.

Facing west towards main building.

Photo 19 – Stormwater pond leak detection piping prior to anchoring of liners.

West corner of pond.

Photo 20 – Stormwater pond trenching for anchoring of liners.

Facing south towards the East Container Storage Building.

Photo 21 – Completed liner for stormwater pond 06/24/25.

Facing northeast.

Photo 22 –Completed liner for stormwater pond 06/24/25.

Facing east.

Photo 23 – Completed stormwater pond 06/25/25.

Facing north.

Photo 24 – Completed stormwater pond 06/25/25.

Facing south towards the East Container Storage Building.

Photo 25 – Completed stormwater pond 06/25/25.

Facing west towards main building.

Photo 26 – Completed stormwater pond spillway 06/25/25.

Facing southwest.