



APPENDIX K – THIRD PARTY 40-MIL HDPE GEOMEMBRANE CONFORMANCE TESTING RESULTS



Geomembrane Quality Certification

Customer: JHL Constructors, Inc.
Project: Cripple Creek & Victor Gold Mine
Destination: Cripple Creek, Co
Report Date: 01-May-2023 10:49 AM

S.O.# SO00018664
Item Number: FG-HDSMTH040BBBEA
Liner Type: HDPE Smooth 40mil Black Average
Roll Count: 1 (From 1 To 1)

#	Roll Number	Prod. Date	Width (ft)	Length (ft)	Area (sqft)	Weight (lb)	Resin Lot#	ASTM D5199			ASTM D8117	ASTM D792	ASTM D1238	ASTM D4218	ASTM D5596	ASTM D6693								ASTM D1004		ASTM D4833	ASTM D5397
								Thickness-Avg	Thickness-Min		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
1	FNB0116140002	04/28/23	23	900	20700	4503	PQC821930	44	41	201	0.947	0.26	2.3	10	177	23	281	796	181	19	297	955	55	53	103	Pending	

Ryan Steele, Lab Manager

For Questions, Please Contact:

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

Certificate of Analysis

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

Recipient: PALMER
Fax:

Delivery #: 80878583
PO #: 20211
Weight: 182700.000 LB
Ship Date: 04/01/2023
Package: BULK
Mode: Hopper Car
Car #: CPCX816487
Seal No: 332259

Product:
MARLEX K307 POLYETHYLENE in Bulk

Lot Number: PQC821930

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.26	g/10min
HLMI Flow Rate	ASTM D1238	21	g/10min
Density	D1505 or D4883	0.938	g/cm3
Pellet Count	PPC-SOP-0028	26	pelet/gram
Production Date		03/30/2023	

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
Quality Systems Coordinator

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



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

NOTICES

Technical Information - By using any Technical Information contained herein, Recipient agrees that said Technical Information is given by CPChem for convenience only, without any warranty or guarantee of any kind, and is accepted and used at your sole risk. Recipients are encouraged to verify independently any such information to their reasonable satisfaction. As used in this paragraph, "Technical Information" includes any technical advice, recommendations, testing, or analysis, including, without limitation, information as it may relate to the selection of a product for a specific use and application.

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 - - -

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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.

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TESTING, RESEARCH, CONSULTING AND FIELD SERVICES

Austin, TX - USA | Anaheim, CA - USA | Anderson, SC - USA | Gold Coast - Australia | Suzhou - China

June 7, 2022

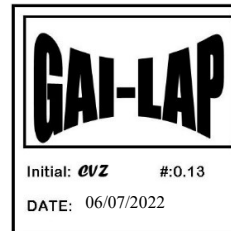
Nikoliya Boyanich

NewFields

9400 Station Street, Suite 300

Lone Tree, CO 80124

Re: FINAL LABORATORY TEST REPORT



Dear Ms. Boyanich:

Thank you for consulting TRI California for your material testing needs.

Enclosed is the **final** laboratory report for the Conformance testing of one (1) 40mil Smooth HDPE sample.

PROJECT NAME: Cripple Creek & Victor Mine VLF2 Ph 3

DATE REPORTED: June 7, 2022

REFERENCE TRI JOB NO.: CA220530

DATE RECEIVED: May 26, 2022

SAMPLED BY: New Fields

SAMPLE IDENTIFICATIONS:

SAMPLE ID

R#GTD0092600004 L#PPA821630

TRI CONTROL NUMBER

163505

TESTS REQUIRED / PERFORMED:

TEST METHOD

1. ASTM D6693
2. ASTM D792
3. ASTM D4218
4. ASTM D1238
5. ASTM D1004
6. ASTM D4833
7. ASTM D5596
8. ASTM D5199

DESCRIPTION

Tensile Properties
Specific Gravity Method A
Carbon Content Muffle
Melt Flow Index
Tear Resistance
Puncture Resistance
Carbon Black Dispersion
Thickness

TEST RESULTS: The test results are summarized in the attached Table 1.

Note: The general conditioning and testing of the material samples identified in this report were performed within the range of the laboratory environmental conditions; i.e., 20-24°C and 45-65% RH. Otherwise, the actual environmental conditions are indicated in the respective test method reported.

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia
Quality Assurance

Chad Blackwell
TRI-CA Director

Signatures are on file

It shall be noted that the sample tested is believed to be true representatives of the material produced under the designation herein stated. In addition, the attached laboratory tests results are considered indicative only of the quality of samples/specimens that were actually tested. The appropriate test methods hereby employed are based on the current and accepted industry practices. TRI neither accepts responsibility for nor makes claims to the intended final use and purpose of the material. The test data and all associated project information shall be held confidential and not to be reproduced and/or disclosed to other parties except in full and with prior written approval from pertinent entity duly authorized by the respective client or from the client itself. It is our policy to keep physical records of each job for two (2) years commencing from the date of receipt of the samples and keep its corresponding electronic file for seven (7) years. **Retained conformance samples are disposed of after one (1) month.** On the other hand, should you need us to keep them at a longer period, please advise us in writing.

3 Pages Total (including this sheet)



TABLE 1.
MATERIAL PROPERTIES
 CLIENT: NewFields
 PROJECT: Cripple Creek & Victor Mine VLF2 Ph 3

Date Received: **5/26/2022**
 Date Reported: **6/7/2022**
 Client Sample ID: **R#GTD0092600004 L#PPA821630**
 Material Description: **40mil Smooth HDPE**

QC'd By: *Maria Espitia*
 TRI Job No.: **CA220530**
 TRI Control No.: **163505**

		SPECIMENS										Avg.	Std. Dev.	Min	Max	Proj. Specs.
		1	2	3	4	5	6	7	8	9	10					
METHOD	DESCRIPTION															
ASTM D5199	Thickness (mils)															
Procedure B	Apparatus:Dead weight dial Micrometer with 6.35 mm (0.250 in) dia presser foot and a pressure of 43.10 kPa (6.38 psi) provided by a 142 gm dead weight. Loading time: 5 sec Specimen Size: 10pcs.-3in. Diameter.															40 min. ave. 36 min.
		40	41	42	42	43	41	42	42	42	42	42	1	40	43	
ASTM D792	Specific Gravity (23/ 23°C)															
Method A		0.9538	0.9535									0.9537	0.0002	0.9535	0.9538	0.940 min. ave.
ASTM D6693	Tensile Properties:															
Type IV	Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Rate of Separation: 2"/min															
	Tensile Strength at Yield (lbs/ in.-width)															
MD		109	114	109	113	109						111	2	109	114	63 min. ave.
TD		110	116	111	110	109						111	3	109	116	
	Tensile Strength at Break (lbs/ in.- width)															
MD		219	219	215	216	204						215	6	204	219	114 min. ave.
TD		187	208	211	187	194						197	12	187	211	
	Elongation at Yield (percent, %)															
MD		19	16	17	16	18						17	1	16	19	12 min. ave.
TD		14	17	16	16	14						15	1	14	17	
	Elongation at Break (percent, %) Gauge Length = 2.0 in.															
MD		859	848	773	864	828						834	37	773	864	700 min. ave.
TD		823	909	922	850	922						885	46	823	922	
ASTM D1004	Tear Resistance (lbs)															
Die C	Machine: Tensile machine equipped with constant rate of extension and chart recorder.															
MD		37.4	34.8	38.0	37.0	37.1	36.0	36.0	36.1	35.7	35.0	36.3	1.0	34.8	38.0	28 min. ave.
TD		32.0	31.1	30.0	32.5	33.0	36.0	34.1	35.0	35.0	34.1	33.3	1.9	30.0	36.0	
	Thickness (mils)															
MD		41	41	40	40	41	41	41	41	42	41	41	1	40	42	-
TD		40	41	40	42	42	42	40	42	40	41	41	1	40	42	

Continued on next page

(Sheet 1 of 2)

LEGENDS:
 MD - MACHINE DIRECTION
 TD- TRANSVERSE DIRECTION



TABLE 1.
MATERIAL PROPERTIES
CLIENT: NewFields
PROJECT: Cripple Creek & Victor Mine VLF2 Ph 3

Date Received: 5/26/2022
Date Reported: 6/7/2022
Client Sample ID: R#GTD0092600004 L#PPA821630
Material Description: 40mil Smooth HDPE

QC'd By: Maria Espitia
TRI Job No.: CA220530
TRI Control No.: 163505

Material Description: 40mm Circular HDPE		SPECIMENS														Proj. Specs.
		1	2	3	4	5	6	7	8	9	10	Avg.	Std. Dev.	Min	Max	
METHOD	DESCRIPTION															
ASTM D4833	Puncture Resistance (lbs) <i>Specimens were tested as directed in Test Method D4833. They were clamped without tension between circular plates of a ring clamp attachment secured in the tensile machine. Test specimens were extended beyond the outer edges of the clamping plates.</i>	117	117	116	113	112	111	111	107	105	105	111	5	105	117	72 min. ave. 9 in Cat. 1 or 2 1 in Cat. 3
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)	1	1	1	1	1	1	1	1	1	1	10 out of 10 in Category 1				
ASTM D1238 Procedure A	Melt Flow Index (grams/ 10 minutes) <i>Condition FR-190/2.16.; Thin 0.1-0.25" specimen strips were charged to the cylinder at a test temperature of 190^o C and 2.16kg load.</i>	0.2641	0.2648	0.2647								0.2645	0.0004	0.2641	0.2648	
ASTM D4218	Carbon Content <i>Apparatus: Muffle Furnace</i>	2.50	2.46									2.48	0.03	2.46	2.50	

(End of Table 1)

(Sheet 2 of 2)

By accepting the data and results presented on this report, the Client agrees to limit the liability of TRI Environmental, Inc. from Client and all other parties for claims on issues, due to the use of this data, to the cost for the respective tests presented in this report; and the Client agrees to indemnify and hold harmless TRI Environmental, Inc. from and against all liabilities in excess of the aforementioned limit.

LEGENDS:
MD - MACHINE DIRECTION
TD- TRANSVERSE DIRECTION



APPENDIX L – TENSIO METER CERTIFICATIONS



CALIBRATION CERTIFICATE

Tensiometer Model: Pro-Tester [T-0100/A or T-0100SE/A]
Device Calibrated: S-Type load cell Calibration Apparatus:
Range: 0 - 750 lbs. Tension
Model No: M2405-750# Pro-Cal unit, model TC-0100/A
Serial No: 29993

A/D Module Model No: T-029
A/D Module Serial No: 1415029993
Channel No: N/A

Dead Weight:

W1	2
W2	152
W3	302

Reference Cell:

R1	2
R2	152
R3	302

Indicator reading with no load: 0

Offset: 3.674272

Scale: 3.327992

Applied Force lbs.

2
52
102
152
202
252
302

Cell Response:

2
52
102
152
202
252
302

Deviation Error:

0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F

Excitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician:

Nick Taylor

Date: 03/30/23

Signature:



CALIBRATION CERTIFICATE

Tensiometer Model: Pro-Tester [T-0100/A or T-0100SE/A]
Device Calibrated: S-Type load cell Calibration Apparatus:
Range: 0 - 750 lbs. Tension
Model No: M2405-750# Pro-Cal unit, model TC-0100/A
Serial No: 29992

A/D Module Model No: T-029
A/D Module Serial No: 1415029992
Channel No: N/A

Dead Weight:		Reference Cell:	
W1	2	R1	2
W2	152	R2	152
W3	302	R3	302

Indicator reading with no load: 0

Offset: 3.348836

Scale: 3.319443

Applied Force lbs.
2
52
102
152
202
252
302

Cell Response:
2
52
102
152
202
252
302

Deviation Error:
0.00
0.00
0.00
0.00
0.00
0.00
0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Excitation Voltage: 5 V DC

This calibration conforms to the standards set by ASTM E4 and is traceable to NIST standards

Note: A/D Module and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated A/D Modules and load cells are not interchangeable.

Calibration Technician: Nick Taylor
Signature:

Date: 03/30/23

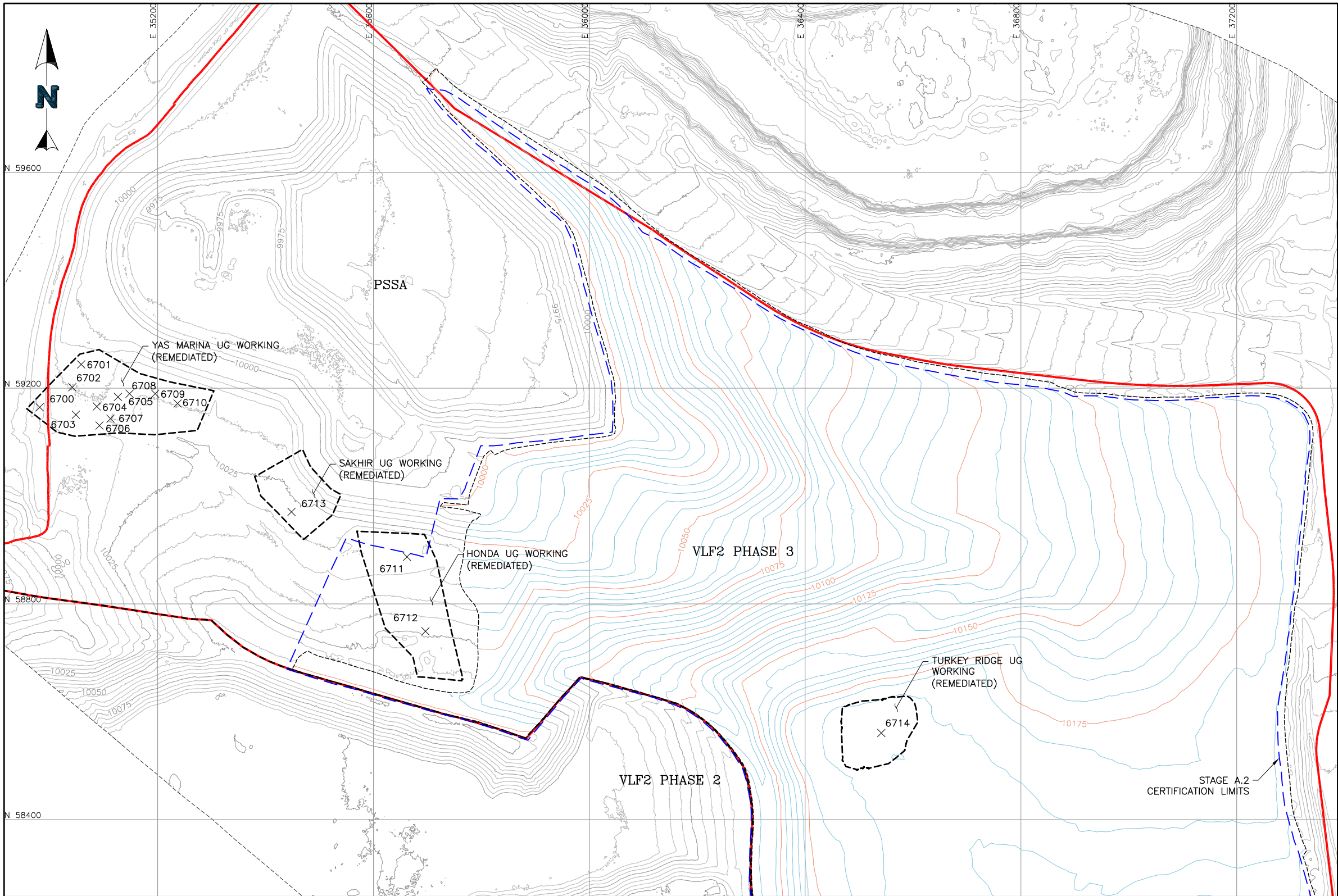


APPENDIX M – UNDERGROUND WORKING OBSERVATIONS

**Cripple Creek & Victor Gold Mining Company
Valley Leach Facility 2
Phase 3 Stage A.2 Record of Construction
Underground Working Summary**

Underground Working IDs			Location			Underground Working Information									Quantities (Approximate)						Remarks
CSB = Coarse Shaft Backfill; SF = Structural Fill; SSF = Select Structural Fill; CRF = Cemented Rockfill																					
Historic ID	NF ID	UG Working ID	Northing	Easting	Elev. (ft)	Working Description	Known or Unknown	Date	Approximate Opening Size	Timbers Present	Confirmation Drilling Performed	Remediation Performed	Remediation Type	Structure Present	CSB (CY)	SF (CY)	Geogrid (ft ²)	SSF (CY)	Concrete (CY)	CRF (CY)	
Un-known	6714	TR	58557.9	36520.9	10145.0	Lateral	Known	2/22/2023	Unknown	No	Yes	Yes	Geogrid (Two Layers)	None	14,094	0	26,166	969	0	0	Working was drilled, blasted, and excavated to 25+ feet. No openings observed.

P:\Projects\0106.060 CC&V 2023 Q1 On-Site Support\A-CAD\FIGS\0106.060.043F.dwg-10/31/2023 6:19 PM

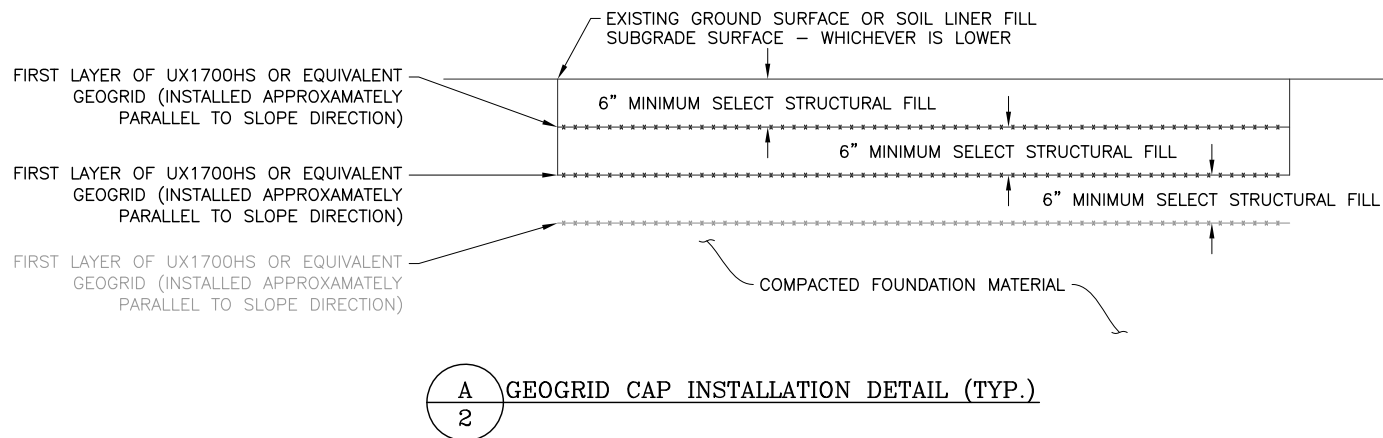


- LEGEND:**
- EXISTING GROUND CONTOURS - 03.01.2023
 - AS-BUILT SUBGRADE CONTOURS
 - VLF2 PHASE 3 STAGE A LIMITS
 - VLF2 PHASE 3 STAGE A.2 CERTIFICATION LIMITS
 - VLF2 PHASE 2 LIMITS
 - UNDERGROUND (UG) WORKING BOUNDARY
 - UG WORKING



 NewFields		CLIENT CRIPPLE CREEK & VICTOR GOLD MINING COMPANY	
PROJECT		VLF2 PHASE 3 STAGE A.2	
TITLE	UNDERGROUND WORKINGS IN THE PROJECT AREA	FILENAME 0106.060.043F	
		FIGURE NO.	REVISION
		1	A

P:\Projects\0106.060 CC&V 2023 Q1 On-Site Support\A-CAD\FIGS\0106.060.62F.dwg--10/31/2023 6:19 PM



GEOGRID CAP INSTALLATION NOTES:

1. CONTRACTOR TO INSTALL DIRECTION OF MAXIMUM STRENGTH FOR THE SECOND LAYER OF UX1700HS OR EQUIVALENT HS GEOGRID TRANSVERSE TO THE DIRECTION OF MAXIMUM STRENGTH FOR THE FIRST LAYER OF UX1700HS GEOGRID.
2. A THIRD GEOGRID LAYER MAY BE ADDED IN AREAS UNDER HIGH NORMAL LOAD. AREAS REQUIRING THIRD GEOGRID WILL BE DETERMINED DURING REMEDIATION.
3. GEOGRID CAP TO EXTEND MINIMUM 15 FEET BEYOND MINE WORKING LIMIT.



		CLIENT Cripple Creek & Victor Gold Mining Company	
PROJECT		VLF2 PHASE 3 STAGE A.2	
TITLE	UNDERGROUND WORKINGS TYPICAL REMEDIATION DETAILS	FILENAME 0106.060.62F	
		FIGURE NO. 2	REVISION A

P:\Projects\0106.060 CC&V 2023 Q1 On-Site Support\A-CAD\FIGS\0106.060.60F.dwg-10/31/2023 6:18 PM

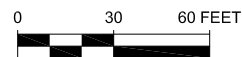
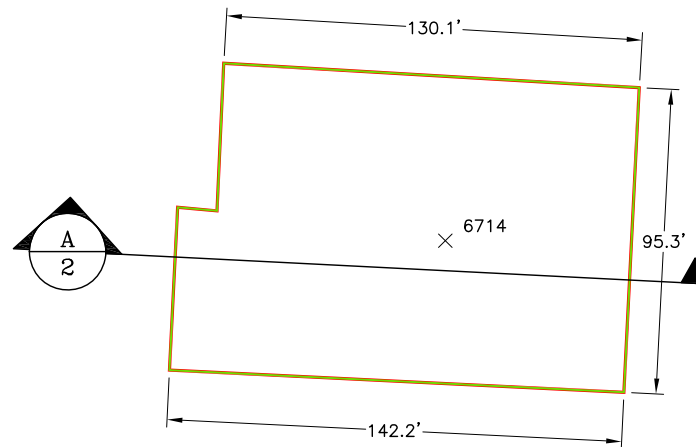


LEGEND:

- GEOGRID LAYER ONE
- GEOGRID LAYER TWO
- × 6712 UG WORKING

QUANTITIES

GEOGRID: 26,166 SF
SELECT STRUCTURAL FILL: 969 CY



		CLIENT CRIPPLE CREEK AND VICTOR GOLD MINING COMPANY	
PROJECT		VLF2 PHASE 3 STAGE A.2	
TITLE		TURKEY RIDGE UG WORKING	
		FIGURE NO.	REVISION
		3	A