

March 26, 2014

Allan Brantley
Brantley Engineering, LLC.
 13933 Tree Loft Road
 Milton, GA 30004



Re: FINAL LABORATORY TEST REPORT

Dear Mr. Brantley:

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

Enclosed is the **final** laboratory report for the conformance testing of one (1) 60mil HDPE Microspike Geomembrane sample.

PROJECT NAME: Jed Cell 10

DATE REPORTED: March 26, 2014

REFERENCE TRI JOB NO.: G140260

DATE RECEIVED: March 21, 2014

SAMPLES SENT BY: AGRU, SC

SAMPLE IDENTIFICATIONS:

SAMPLE ID

1. R#G14C111004 L#H8240217

TRI CONTROL NUMBER

97035

TESTS REQUIRED / PERFORMED:

TEST METHOD

1. ASTM D5994
2. ASTM D1505
3. ASTM D6639
4. ASTM D1603
5. ASTM D5596

DESCRIPTION

Thickness
 Density
 Tensile Properties
 Carbon Black Content
 Carbon Black Dispersion

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

Respectfully,

TRI Environmental, Inc. - California

Maria Espitia

Maria Espitia
 Quality Assurance

Carmelo V. Zantua
 Technical Director

Signatures are on file

It shall be noted that the samples tested are 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.

2 Pages Total

TABLE 1.
MATERIAL PROPERTIES
 CLIENT: Brantley Engineering, LLC.
 PROJECT: Jed Cell 10

Date Received: 3/21/2014
 Date Reported: 3/28/2014
 Client Sample ID: R# G14C111004 L#H8240217
 Material Description: 60mil HDPE Microspike Geomembrane

QC'd By: *Maria Espitia*
 TRI Job No.: G140260
 TRI Control No.: 97035

SPECIMENS											Avg.	Std. Dev.	Min	Max	Proj. Specs.
	1	2	3	4	5	6	7	8	9	10					
METHOD	DESCRIPTION														
ASTM D5994	Thickness (mils) <i>Apparatus: Dead-weight dial micrometer with gauge points tapered at an angle of 60° +/- 2° to the horizontal with the tip rounded to a radius of 0.8+/-0.1 mm(0.031+/-0.004 in), with a specified force of 0.56+/-0.05 N (2+/-0.2 oz)</i> <i>Loading Time: 5 sec Specimen Size: 4" x 4"</i>														60 nominal 54 min.
	60	61	61	62	61	62	61	61	64	61	61	1	60	64	
ASTM D1505	Density (grams/ cm. ³) 0.9435 0.9441 0.9443										0.9440	0.0005	0.9435	0.9443	.94 min.
ASTM D6693 Type IV	<u>Tensile Properties:</u> <i>Test Specimens: Type IV, Width of narrow section:0.25in, Length of narrow section:1.3in, Width Overall:0.75in, Length Overall: 4.5in Conditioning: Conducted test in standard laboratory atmosphere of 23+/-2° C (73.4+/-3.6° F), and 50+/-5% relative humidity. Rate of Separation: 2"/min</i> Tensile Strength at Yield (lbs/ in.-width) <i>MD 173 154 164 164 141</i> <i>TD 182 180 164 147 178</i> Tensile Strength at Break (lbs/ in.- width) <i>MD 239 167 224 223 175</i> <i>TD 209 253 209 193 209</i> Elongation at Yield (percent, %) <i>MD 21 21 30 28 29</i> <i>TD 16 20 16 18 18</i> Elongation at Break (percent, %) <i>Gauge Length = 2.0 in.</i> <i>MD 403 404 398 384 376</i> <i>TD 546 648 591 568 540</i>														126 min. 90 min. 12 min. 100 min.
											159	12	141	173	
											170	15	147	182	
											206	32	167	239	
											215	23	193	253	
											26	4	21	30	
											18	2	16	20	
											393	12	376	404	
											579	43	540	648	
ASTM D1603	Carbon Black Content (percent, %) 2.30 2.28										2.29	0.02	2.28	2.30	2-3
ASTM D5596	Carbon Black Dispersion (category rating per reference chart PCN: 12-455960-38)										10 out of 10 in Category 1				9 of 10 in Cat. 1 or 2 All in Cat. 1,2, or 3
	1	1	1	1	1	1	1	1	1	1					

(End of Table 1)

(Sheet 1 of 1)

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