



March 13, 2014

Mail To:

Bill Sabatka
Arcadis U.S., Inc.
211 North Florence, Suite 202
El Paso, Texas 79901

email: bill.sabatka@arcadis-us.com

Bill To:

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Dear Mr. Sabatka:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report of the laboratory testing for the sample(s) listed below.

Project: ASARCO El Paso- Category 1 Landfill Cell 3

TRI Job Reference Number: E2386-91-07

Material(s) Tested: One GSE Nonwoven Geotextile(s)

Test(s) Requested: Mass/Unit Area (ASTM D 5261)
Grab Tensile (ASTM D 4632)
Puncture Strength (ASTM D 4833)
Trapezoidal Tear (ASTM D 4533)

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

Sincerely,

Mansukh Patel
Laboratory Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com



GEOTEXTILE TEST RESULTS

TRI Client: Arcadis U.S., Inc.

Project: ASARCO El Paso- Category 1 Landfill Cell 3

Material: GSE 12oz. Nonwoven Geotextile

Sample Identification: 130466537

TRI Log #: E2386-91-07

PARAMETER	TEST REPLICATE NUMBER										STD.	
	1	2	3	4	5	6	7	8	9	10	MEAN	DEV.
Mass/Unit Area (ASTM D 5261)												
5" diameter circle (grams)	4.35	4.18	5.56	6.62	6.11	5.56	5.66	5.54	5.00	5.78	5.44	0.75
Mass/Unit Area (oz/sq.yd)	10.1	9.72	12.9	15.4	14.2	12.9	13.2	12.9	11.6	13.4	12.6	1.74
Grab Tensile Properties (ASTM D 4632)												
MD - Tensile Strength (lbs)	427	372	458	457	534	386	457	429	430	500	445	49
TD - Tensile Strength (lbs)	404	415	457	342	400	446	368	489	537	470	433	58
MD - Elong. @ Max. Load (%)	86	81	87	92	84	85	86	85	73	88	85	5
TD - Elong. @ Max. Load (%)	119	103	107	108	118	123	110	103	117	114	112	7
Puncture Resistance (ASTM D 4833)												
Puncture Strength (lbs)	153	285	209	168	256	210	293	202	238	124	223	54
	175	231	302	276	221							
Trapezoidal Tear (ASTM D 4533)												
MD - Tear Strength (lbs)	166	268	166	199	241	156	176	190	184	226	197	37
TD - Tear Strength (lbs)	251	232	250	195	208	215	286	255	254	285	243	31
MD Machine Direction	TD Transverse Direction											