

Graham, Cory (SD)

From: Mario Poveda <mpoveda@kgsgroup.com>
Sent: Friday, October 18, 2019 12:12 PM
To: Graham, Cory (SD)
Cc: Jason Mann; Raichura, Ash; Irvin
Subject: BRRMF - Cell 32 - Notification to MSD for use authorization
Attachments: L90011_BRADY LANDFILL QA-QC PACKAGE.pdf;
15-0107-014-_DensityTesting2019.pdf; BRRMF - Cell 32 - Atterberg Limits and HC test for two samples.pdf; Proctor_123314413_KGS Group Inc _Client_14413_1_20190807.pdf

Importance: High

Good afternoon Ms. Graham.

Construction of the new Cell 32 at Brady Road Resource Management Facility is almost complete. The last critical component is the installation of the filter geotextile on top of the drainage gravel layer and it is expected to be completed by Tuesday October 22.

I am attaching the complete QA/QC report from Titan Environmental for the HDPE geomembrane and geotechnical laboratory results for the Engineered Clay Liner for your reference.

As shown in the design drawings, the complete seepage barrier at the cell includes (from top-down):

- 8 oz. non-woven geotextile (filter)
- 300 mm of drainage gravel (comprised of two different 150 mm layers)
- 16 oz. non-woven geotextile (cushion)
- 60 mil HDPE geomembrane
- 150 mm of re-compacted clay liner

The perforated HDPE pipe has also been installed, as well as the vertical manhole for extracting the leachate via a compressed air driven pump.

The City is requesting authorization to commence the use of the new cell for landfilling purposes. Please review this information and let us know your decision at your earliest convenience.

Thank you for your time.

Regards,

Mario Poveda M.Sc., P.Eng.
ENVIRONMENTAL ENGINEER



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L9011

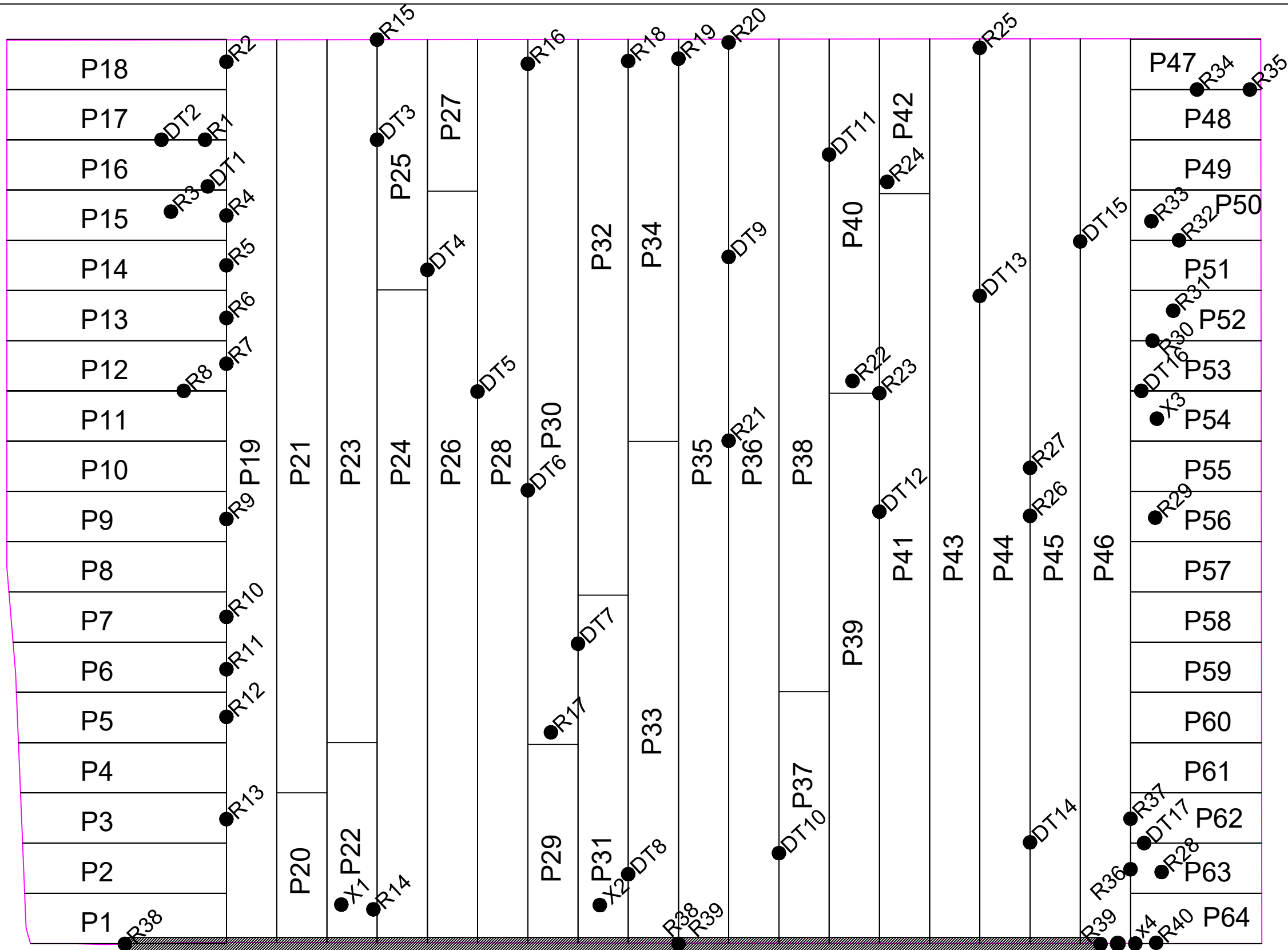
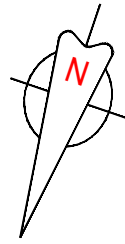
**BRADY ROAD LANDFILL CELL 32
HDPE & GEOTEXTILE AS-BUILT**

WINNIPEG, MB

COMPLETED 15-OCT-19

LEGEND:

—ANCHOR TRENCH/ TIE-IN



NO EXISTING MATERIAL FOR TIE-IN, AREA TO BE CLAY CAPPED BY OTHERS.



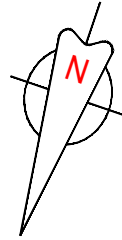
Report any discrepancies to Titan Environmental Containment Ltd. Do not scale dimensions from drawing. Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Titan Environmental Containment Ltd. Final Panel Locations to be installed at the discretion of the TITAN field Superintendent as see fit to existing site conditions..

NOT APPROVED FOR CONSTRUCTION

PROJ. NO.:	L9011	BRADY ROAD LANDFILL CELL 32			
DATE:	15-OCT-19	TITAN ENVIRONMENTAL CONTAINMENT LTD.			
DRAWN BY:	EA	CLIENT:	CITY OF WINNIPEG		
REV. BY:	EA	DWG TITLE:	HDPE LINER AS-BUILT		
SCALE:	NTS	REV. NO.:	000	DWG NO.:	001

LEGEND:

—ANCHOR TRENCH/ TIE-IN



G28		G74	
G27	G72	G73	
G26		G70	G71
G25		G69	
G24	G67	G68	
G23		G65	G66
G22		G64	
G21	G62	G63	
G20		G60	G61
G19		G59	
G18	G57	G58	
G17		G55	G56
G16		G54	
G15	G52	G53	
G14		G50	G51
G13		G49	
G12	G47	G48	
G11		G45	G46
G10		G44	
G9	G42	G43	
G8		G40	G41
G7		G39	
G6	G37	G38	
G5		G35	G36
G4		G34	
G3	G32	G33	
G2		G30	G31
G1		G29	



Report any discrepancies to Titan Environmental Containment Ltd. Do not scale dimensions from drawing. Do not modify drawing, re-use it, or use it for purposes other than those intended at the time of its preparation without prior written permission from Titan Environmental Containment Ltd. Final Panel Locations to be installed at the descretion of the TITAN field Superintendant as see fit to existing site conditions..

NOT APPROVED FOR CONSTRUCTION

PROJ. NO.:	L9011	BRADY ROAD LANDFILL CELL 32			
DATE:	15-OCT-19	TITAN ENVIRONMENTAL CONTAINMENT LTD.			
DRAWN BY:	EA	CLIENT:	CITY OF WINNIPEG		
REV. BY:	EA	DWG TITLE:	GEOTEXTILE LINER AS-BUILT		
SCALE:	NTS	REV. NO.:	000	DWG NO.:	002



PANEL PLACEMENT LOG

Project Name: Brady Landfill		Product Type: Geotextile 16oz			
DATE	PANEL NUMBER	ROLL NUMBER	LENGTH	WIDTH	COMMENTS
DD/MMM/YY			FEET		
08/09/2019	G1	TE-E116	300	15	
08/09/2019	G2	TE-E116	300	15	
08/09/2019	G3	TE-E116	300	15	
08/09/2019	G4	TE-E116	300	15	
08/09/2019	G5	TE-E116	300	15	
08/09/2019	G6	TE-E116	300	15	
08/09/2019	G7	TE-E116	300	15	
08/09/2019	G8	TE-E116	300	15	
08/09/2019	G9	TE-E116	300	15	
08/09/2019	G10	TE-E116	300	15	
08/09/2019	G11	TE-E116	300	15	
08/09/2019	G12	TE-E116	300	15	
08/09/2019	G13	TE-E116	300	15	
08/09/2019	G14	TE-E116	300	15	
08/09/2019	G15	TE-E116	300	15	
08/09/2019	G16	TE-E116	300	15	
08/09/2019	G17	TE-E116	300	15	
08/09/2019	G18	TE-E116	300	15	
08/09/2019	G19	TE-E116	300	15	
08/09/2019	G20	TE-E116	300	15	
08/09/2019	G21	TE-E116	300	15	
08/09/2019	G22	TE-E116	300	15	
08/09/2019	G23	TE-E116	300	15	
08/09/2019	G24	TE-E116	300	15	
08/09/2019	G25	TE-E116	300	15	
08/09/2019	G26	TE-E116	300	15	
08/09/2019	G27	TE-E116	300	15	
08/09/2019	G28	TE-E116	300	15	
08/09/2019	G29	TE-E116	240	15	
08/09/2019	G30	TE-E116	180	15	
08/09/2019	G31	TE-E116	60	15	
08/09/2019	G32	TE-E116	120	15	
08/09/2019	G33	TE-E116	120	15	
08/09/2019	G34	TE-E116	240	15	
08/09/2019	G35	TE-E116	180	15	
08/09/2019	G36	TE-E116	60	15	
08/09/2019	G37	TE-E116	120	15	
08/09/2019	G38	TE-E116	120	15	
08/09/2019	G39	TE-E116	240	15	



PANEL PLACEMENT LOG

Project Name: Brady Landfill			Product Type: Geotextile 16oz		
DATE	PANEL NUMBER	ROLL NUMBER	LENGTH	WIDTH	COMMENTS
DD/MMM/YY			FEET		
08/09/2019	G40	TE-E116	180	15	
08/09/2019	G41	TE-E116	60	15	
08/09/2019	G42	TE-E116	120	15	
08/09/2019	G43	TE-E116	120	15	
08/09/2019	G44	TE-E116	240	15	
08/09/2019	G45	TE-E116	180	15	
08/09/2019	G46	TE-E116	60	15	
08/09/2019	G47	TE-E116	120	15	
08/09/2019	G48	TE-E116	120	15	
08/09/2019	G49	TE-E116	240	15	
08/09/2019	G50	TE-E116	180	15	
08/09/2019	G51	TE-E116	60	15	
08/09/2019	G52	TE-E116	120	15	
08/09/2019	G53	TE-E116	120	15	
08/09/2019	G54	TE-E116	240	15	
08/09/2019	G55	TE-E116	180	15	
08/09/2019	G56	TE-E116	60	15	
08/09/2019	G57	TE-E116	120	15	
08/09/2019	G58	TE-E116	120	15	
08/09/2019	G59	TE-E116	240	15	
08/09/2019	G60	TE-E116	180	15	
08/09/2019	G61	TE-E116	60	15	
08/09/2019	G62	TE-E116	120	15	
08/09/2019	G63	TE-E116	120	15	
08/09/2019	G64	TE-E116	240	15	
08/09/2019	G65	TE-E116	180	15	
08/09/2019	G66	TE-E116	60	15	
08/09/2019	G67	TE-E116	120	15	
08/09/2019	G68	TE-E116	120	15	
08/09/2019	G69	TE-E116	240	15	
08/09/2019	G70	TE-E116	180	15	
08/09/2019	G71	TE-E116	60	15	
08/09/2019	G72	TE-E116	120	15	
08/09/2019	G73	TE-E116	120	15	
08/09/2019	G74	TE-E116	240	15	



PANEL PLACEMENT LOG

Project Name: Brady Landfill			Product Type: 60mil HDPE		
DATE	PANEL NUMBER	ROLL NUMBER	LENGTH	WIDTH	COMMENTS
DD/MMM/YY			FEET		
05/09/2019	P1	44345	68	23	Double Sided Textured
05/09/2019	P2	44345	68	23	Double Sided Textured
05/09/2019	P3	44345	69	23	Double Sided Textured
05/09/2019	P4	44345	69	23	Double Sided Textured
05/09/2019	P5	44345	70	23	Double Sided Textured
05/09/2019	P6	44345	71	23	Double Sided Textured
05/09/2019	P7	44345	72	23	Double Sided Textured
05/09/2019	P8	44347	74	23	Double Sided Textured
05/09/2019	P9	44347	74	23	Double Sided Textured
05/09/2019	P10	44347	73	23	Double Sided Textured
05/09/2019	P11	44347	72	23	Double Sided Textured
05/09/2019	P12	44347	72	23	Double Sided Textured
05/09/2019	P13	44347	72	23	Double Sided Textured
05/09/2019	P14	44347	72	23	Double Sided Textured
05/09/2019	P15	44343	72	23	Double Sided Textured
05/09/2019	P16	44343	72	23	Double Sided Textured
05/09/2019	P17	44343	72	23	Double Sided Textured
05/09/2019	P18	44343	72	23	Double Sided Textured
06/09/2019	P19	103480	384	23	Smooth
06/09/2019	P20	103480	20	23	Smooth
06/09/2019	P21	103484	364	23	Smooth
06/09/2019	P22	103484	106	23	Smooth
06/09/2019	P23	103481	278	23	Smooth
06/09/2019	P24	103481	240	23	Smooth
06/09/2019	P25	144391	147	23	Smooth
06/09/2019	P26	144391	336	23	Smooth
06/09/2019	P27	144392	50	23	Smooth
06/09/2019	P28	144392	385	23	Smooth
06/09/2019	P29	144392	60	23	Smooth
06/09/2019	P30	144396	225	23	Smooth
06/09/2019	P31	144396	160	23	Smooth
06/09/2019	P32	144393	225	23	Smooth
06/09/2019	P33	144393	285	23	Smooth
06/09/2019	P34	144390	100	23	Smooth
07/09/2019	P35	144390	385	23	Smooth
07/09/2019	P36	144397	385	23	Smooth
07/09/2019	P37	144397	120	23	Smooth
07/09/2019	P38	103485	265	23	Smooth
07/09/2019	P39	103485	235	23	Smooth



WEDGE SEAM LOG

Project Name: Brady Landfill							Product Type: 60mil HDPE				
SEAM LOG							AIR TEST INFORMATION				
BETWEEN PANELS	WELD DATE	TIME OF DAY		TECHNICIAN	WEDGE #	SEAM LENGTH	TEST DATE	START PSI	FINISH PSI	TEST RESULTS	QC TECHNICIAN
		DD/MMM/YY	AM								
P1/P2	05/09/2019		1250	KD	11	68	06/09/2019	43	42	PASS	KH
P2/P3	05/09/2019		1250	OL	32	68	06/09/2019	46	46	PASS	KH
P3/P4	05/09/2019		105	KD	11	69	06/09/2019	42	42	PASS	KH
P4/P5	05/09/2019		104	OL	32	69	06/09/2019	39	39	PASS	KH
P5/P6	05/09/2019		120	KD	11	70	06/09/2019	42	41	PASS	KH
P6/P7	05/09/2019		116	OL	32	71	06/09/2019	41	41	PASS	KH
P7/P8	05/09/2019		133	KD	11	72	06/09/2019	47	47	PASS	KH
P8/P9	05/09/2019		129	OL	32	74	06/09/2019	49	47	PASS	KH
P9/P10	05/09/2019		149	KD	11	73	06/09/2019	51	51	PASS	KH
P10/P11	05/09/2019		145	OL	32	73	06/09/2019	36	36	PASS	KH
P11/P12	05/09/2019		200	KD	11	72	06/09/2019	46	46	PASS	KH
P12/P13	05/09/2019		200	OL	32	72	06/09/2019	45	45	PASS	KH
P13/P14	05/09/2019		218	KD	11	72	06/09/2019	45	44	PASS	KH
P14/P15	05/09/2019		220	OL	32	72	06/09/2019	42	42	PASS	KH
P15/P16	05/09/2019		230	KD	11	72	06/09/2019	40	39	PASS	KH
P16/P17	05/09/2019		235	OL	32	72	06/09/2019	46	46	PASS	KH
P17/P18	05/09/2019		244	KD	11	72	06/09/2019	43	43	PASS	KH
										PASS	KH
P20/P21	06/09/2019	950		OL	32	23	06/09/2019	42	42	PASS	KH
P19/P20,21	06/09/2019	1000		KD	11	285	06/09/2019	40	40	PASS	KH
P22/P23	06/09/2019	955		KD	11	23	06/09/2019	46	44	PASS	KH
P20,21/P22,23	06/09/2019	1030		OL	32	285	06/09/2019	39	39	PASS	KH
P24/P25	06/09/2019	1110		OL	32	23	06/09/2019	45	45	PASS	KH
P22,23/P24,25	06/09/2019	1115		KD	11	285	06/09/2019	46	45	PASS	KH
P26/P27	06/09/2019	1138		OL	11	23	06/09/2019	42	40	PASS	KH
P24,25/P26,27	06/09/2019	1142		OL	32	285	06/09/2019	41	41	PASS	KH
P26,27/P28	06/09/2019		210	KD	11	285	06/09/2019	39	38	PASS	KH
P29/P30	06/09/2019		215	OL	32	23	07/09/2019	42	41	PASS	KH
P28/P29,30	06/09/2019		220	OL	32	285	07/09/2019	41	41	PASS	KH
P31/P32	06/09/2019		404	KD	11	23	07/09/2019	47	46	PASS	KH
P29,30/P31,32	06/09/2019		410	KD	11	285	07/09/2019	40	39	PASS	KH
P33/P34	06/09/2019		422	OL	32	23	07/09/2019	40	40	PASS	KH
P31,32/P33,34	06/09/2019		430	OL	32	285	07/09/2019	45	45	PASS	KH
										PASS	KH
P33,34/P35	07/09/2019	1015		OL	32	285	07/09/2019	46	46	PASS	KH
P35/P36	07/09/2019	1022		CS	43	285	07/09/2019	40	40	PASS	KH
P37/P38	07/09/2019	1042		KD	11	23	07/09/2019	39	38	PASS	KH
P36/P37,38	07/09/2019	1047		KD	11	285	07/09/2019	41	41	PASS	KH



BUTT SEAM LOG

Project Name: Brady Landfill Product Type: 60mil HDPE

BUTT SEAM LOG									AIR TEST INFORMATION				
BUTT SEAM LETTER	BUTT SEAM		WELD DATE	TIME OF DAY		TECHNICIAN	WEDGE #	SEAM LENGTH	TEST DATE	START PSI	FINISH PSI	TEST RESULTS	QC TECHNICIAN
	Seam Starts Between Panels	Finishes Between Panels	DD/MMM/YY	AM	PM			FEET					
	P18/P19	P1/P19	06/09/2019	1005		CS	43	390					
	P19	P1							06/07/2019	41	40	PASS	KH
	P19	P2							06/07/2019	40	40	PASS	KH
	P19	P3							06/07/2019	37	36	PASS	KH
	P19	P4							06/07/2019	48	47	PASS	KH
	P19	P5							06/07/2019	40	39	PASS	KH
	P19	P6							06/07/2019	41	40	PASS	KH
	P19	P7							06/07/2019	46	44	PASS	KH
	P19	P8							06/07/2019	37	37	PASS	KH
	P19	P9							06/07/2019	50	50	PASS	KH
	P19	P10							06/07/2019	38	37	PASS	KH
	P19	P11							06/07/2019	43	43	PASS	KH
	P19	P12							06/07/2019	46	45	PASS	KH
	P19	P13							06/07/2019	40	40	PASS	KH
	P19	P14							06/07/2019	39	39	PASS	KH
	P19	P15							06/07/2019	42	41	PASS	KH
	P19	P16							06/07/2019	47	45	PASS	KH
	P19	P17							06/07/2019	50	49	PASS	KH
	P19	P18							06/07/2019	42	42	PASS	KH
	P64/P46	P47/P46	07/09/2019		530	OL	32	387					
	P46	P47							07/09/2019	42	40	PASS	KH
	P46	P48							07/09/2019	46	46	PASS	KH
	P46	P49							07/09/2019	40	40	PASS	KH
	P46	P50							07/09/2019	38	37	PASS	KH
	P46	P51							07/09/2019	36	35	PASS	KH
	P46	P52							07/09/2019	46	45	PASS	KH
	P46	P53							07/09/2019	43	43	PASS	KH
	P46	P54							07/09/2019	48	48	PASS	KH
	P46	P55							07/09/2019	49	48	PASS	KH
	P46	P56							07/09/2019	39	38	PASS	KH
	P46	P57							07/09/2019	46	45	PASS	KH
	P46	P58							07/09/2019	44	44	PASS	KH



WEDGE TRIAL LOG

Project Name: BRADY LANDFILL

Product Type: 60mil HDPE

Wedge #: 32
 Date: 05/09/2019
 Sheet Type: 60 mil HDPE

AM TEST

Time: <u>1116</u> AM		ELONGATION	BREAK TYPE
Technician: <u>OL</u>			
Ambient Temp: <u>21</u> °C			
Wedge Speed: <u>550</u> ft/hr			
Wedge Temp: <u>860F</u> °C / °F			
INSIDE PEEL	128	200%+	F.T.B.
	125	200%+	F.T.B.
	132	200%+	F.T.B.
	120	200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL	115	200%+	F.T.B.
	126	200%+	F.T.B.
	111	200%+	F.T.B.
	119	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	156	200%+	F.T.B.
	152	200%+	F.T.B.
	139	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: _____ PM		ELONGATION	BREAK TYPE
Technician: _____			
Ambient Temp: _____ °C			
Wedge Speed: _____ ft/hr			
Wedge Temp: _____ °C / °F			
INSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:

Wedge #: 11
 Date: 05/09/2019
 Sheet Type: 60 mil HDPE

AM TEST

Time: <u>1115</u> AM		ELONGATION	BREAK TYPE
Technician: <u>KD</u>			
Ambient Temp: <u>21</u> °C			
Wedge Speed: <u>480</u> ft/hr			
Wedge Temp: <u>860F</u> °C / °F			
INSIDE PEEL	126	200%+	F.T.B.
	112	200%+	F.T.B.
	120	200%+	F.T.B.
	121	200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL	120	200%+	F.T.B.
	110	200%+	F.T.B.
	116	200%+	F.T.B.
	118	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	135	200%+	F.T.B.
	142	200%+	F.T.B.
	141	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: _____ PM		ELONGATION	BREAK TYPE
Technician: _____			
Ambient Temp: _____ °C			
Wedge Speed: _____ ft/hr			
Wedge Temp: _____ °C / °F			
INSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:



WEDGE TRIAL LOG

Project Name: BRADY LANDFILL

Product Type: 60mil HDPE

Wedge #: 32
 Date: 06/09/2019
 Sheet Type: 60 mil HDPE

AM TEST

Time: <u>820</u> AM Technician: <u>OL</u> Ambient Temp: <u>22</u> °C Wedge Speed: <u>530</u> ft/hr Wedge Temp: <u>860F</u> °C / °F		ELONGATION	BREAK TYPE
INSIDE PEEL	120		
	117	200%+	F.T.B.
	112	200%+	F.T.B.
	117	200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL	122	200%+	F.T.B.
	128	200%+	F.T.B.
	117	200%+	F.T.B.
	119	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	142	200%+	F.T.B.
	156	200%+	F.T.B.
	147	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: <u>200</u> PM Technician: <u>OL</u> Ambient Temp: <u>26</u> °C Wedge Speed: <u>530</u> ft/hr Wedge Temp: <u>860F</u> °C / °F		ELONGATION	BREAK TYPE
INSIDE PEEL	125		
	126	200%+	F.T.B.
	120	200%+	F.T.B.
	119	200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL	128	200%+	F.T.B.
	124	200%+	F.T.B.
	125	200%+	F.T.B.
	120	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	157	200%+	F.T.B.
	162	200%+	F.T.B.
	145	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:

Wedge #: 11
 Date: 06/09/2019
 Sheet Type: 60 mil HDPE

AM TEST

Time: <u>800</u> AM Technician: <u>KD</u> Ambient Temp: <u>20</u> °C Wedge Speed: <u>480</u> ft/hr Wedge Temp: <u>860F</u> °C / °F		ELONGATION	BREAK TYPE
INSIDE PEEL	120		
	109	200%+	F.T.B.
	118	200%+	F.T.B.
	119	200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL	122	200%+	F.T.B.
	124	200%+	F.T.B.
	117	200%+	F.T.B.
	114	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	156	200%+	F.T.B.
	143	200%+	F.T.B.
	148	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: <u>200</u> PM Technician: <u>KD</u> Ambient Temp: <u>25</u> °C Wedge Speed: <u>480</u> ft/hr Wedge Temp: <u>860F</u> °C / °F		ELONGATION	BREAK TYPE
INSIDE PEEL	122		
	126	200%+	F.T.B.
	120	200%+	F.T.B.
	121	200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL	119	200%+	F.T.B.
	116	200%+	F.T.B.
	123	200%+	F.T.B.
	116	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	154	200%+	F.T.B.
	150	200%+	F.T.B.
	146	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:



WEDGE TRIAL LOG

Project Name: BRADY LANDFILL

Product Type: 60mil HDPE

Wedge #: 32
 Date: 07/09/2019
 Sheet Type: 60 mil HDPE

AM TEST

Time: _____ AM		ELONGATION	BREAK TYPE
Technician: _____			
Ambient Temp: _____ °C			
Wedge Speed: _____ ft/hr			
Wedge Temp: _____ °C / °F			
INSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: <u>525</u> PM		ELONGATION	BREAK TYPE
Technician: <u>OL</u>			
Ambient Temp: <u>22</u> °C			
Wedge Speed: <u>500</u> ft/hr			
Wedge Temp: <u>860</u> °F			
INSIDE PEEL		106	200%+ F.T.B.
		109	200%+ F.T.B.
		117	200%+ F.T.B.
		110	200%+ F.T.B.
			200%+ F.T.B.
OUTSIDE PEEL		99	200%+ F.T.B.
		104	200%+ F.T.B.
		103	200%+ F.T.B.
		109	200%+ F.T.B.
			200%+ F.T.B.
SHEAR		145	200%+ F.T.B.
		139	200%+ F.T.B.
		137	200%+ F.T.B.
			200%+ F.T.B.
			200%+ F.T.B.

NOTES:

Wedge #: _____
 Date: _____
 Sheet Type: _____

AM TEST

Time: _____ AM		ELONGATION	BREAK TYPE
Technician: _____			
Ambient Temp: _____ °C			
Wedge Speed: _____ ft/hr			
Wedge Temp: _____ °C / °F			
INSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: _____ PM		ELONGATION	BREAK TYPE
Technician: _____			
Ambient Temp: _____ °C			
Wedge Speed: _____ ft/hr			
Wedge Temp: _____ °C / °F			
INSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:



EXTRUDER TRIAL LOG

Project Name: Brady Landfill Product Type: 60mil HDPE

Extruder#: 5
 Date: 06/09/2019
 Sheet Type: 60mil HDPE

AM TEST

Time: <u>900</u> AM Technician: <u>RN</u> Ambient Temp: <u>22</u> °C Barrel/Air Temp: <u>460 / 450</u> °C		ELONGATION	BREAK TYPE
PEEL	99	200%+	F.T.B.
	109	200%+	F.T.B.
	105	200%+	F.T.B.
	102	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	148	200%+	F.T.B.
	167	200%+	F.T.B.
	160	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: <u>200</u> PM Technician: <u>RN</u> Ambient Temp: <u>24</u> °C Barrel/Air Temp: <u>460 / 450</u> °C		ELONGATION	BREAK TYPE
PEEL	103	200%+	F.T.B.
	110	200%+	F.T.B.
	104	200%+	F.T.B.
	109	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	155	200%+	F.T.B.
	145	200%+	F.T.B.
	152	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:

Extruder#: 5
 Date: 07/09/2019
 Sheet Type: 60mil HDPE

NOTES:

AM TEST

Time: <u>900</u> AM Technician: <u>RN</u> Ambient Temp: <u>21</u> °C Barrel/Air Temp: <u>460 / 450</u> °C		ELONGATION	BREAK TYPE
PEEL	109	200%+	F.T.B.
	117	200%+	F.T.B.
	97	200%+	F.T.B.
	99	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	140	200%+	F.T.B.
	139	200%+	F.T.B.
	143	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: <u>155</u> PM Technician: <u>RN</u> Ambient Temp: <u>24</u> °C Barrel/Air Temp: <u>460 / 450</u> °C		ELONGATION	BREAK TYPE
PEEL	121	200%+	F.T.B.
	116	200%+	F.T.B.
	119	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR	135	200%+	F.T.B.
	145	200%+	F.T.B.
	139	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.



EXTRUDER TRIAL LOG

Project Name: Brady Landfill Product Type: 60mil HDPE

Extruder#: 5
 Date: 08/09/2019
 Sheet Type: 60mil HDPE

AM TEST

Time: <u>920</u> AM		ELONGATION	BREAK TYPE
Technician: <u>DP</u>			
Ambient Temp: <u>19</u> °C			
Barrel/Air Temp: <u>460 / 450</u> °C			
PEEL	112	200%+	F.T.B.
	114	200%+	F.T.B.
	110	200%+	F.T.B.
	116	200%+	F.T.B.
SHEAR	156	200%+	F.T.B.
	150	200%+	F.T.B.
	154	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

PM TEST

Time: <u>210</u> PM		ELONGATION	BREAK TYPE
Technician: <u>DP</u>			
Ambient Temp: <u>24</u> °C			
Barrel/Air Temp: <u>460 / 450</u> °C			
PEEL	118	200%+	F.T.B.
	123	200%+	F.T.B.
	109	200%+	F.T.B.
	107	200%+	F.T.B.
		200%+	F.T.B.
SHEAR	148	200%+	F.T.B.
	135	200%+	F.T.B.
	138	200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.

NOTES:



EXTRUSION DETAIL LOG

CODE LEGEND
BO-BLOCK OFF
P-PATCH
PT-PENETRATION
E-EXTRUSION BEAD
T-THREE PANEL INTERSECTION
C-CAP
DT-DESTRUCTIVE TEST

Project Name Brady Landfill

Product Type: 60mil HDPE

* UNLESS OTHERWISE NOTED, ALL 3 PANEL INTERSECTIONS COME WITH VACUUM TESTED EXTRUDED T-WELDS.

DETAIL LETTER	DETAIL DATE	TECHNICIAN	CODE	DIMENSIONS	LOCATION	TEST DATE	TEST RESULTS	QC TECH	TEST TYPE
			SEE LEGEND			DD/MMM/YY			
R1	06/09/2019	RN	BO	18'	P16/P17 bottom	08/09/2019	PASS	KH	Vac Box
R2	06/09/2019	RN	BO	6"	P18 @ butt	08/09/2019	PASS	KH	Vac Box
R3	06/09/2019	RN	E	10 X 6"	P15 going up 30'	08/09/2019	PASS	KH	Vac Box
R4	06/09/2019	RN	E	6"	P15 @ butt	08/09/2019	PASS	KH	Vac Box
R5	06/09/2019	RN	BO	6"	P14 @ butt	08/09/2019	PASS	KH	Vac Box
R6	06/09/2019	RN	E	1'	P13 @ butt	08/09/2019	PASS	KH	Vac Box
R7	06/09/2019	RN	E	1'	P12 @ butt	08/09/2019	PASS	KH	Vac Box
R8	06/09/2019	RN	E	6"	P11/P12 1/3 up slope	08/09/2019	PASS	KH	Vac Box
R9	06/09/2019	RN	E	1'	P9 @ butt	08/09/2019	PASS	KH	Vac Box
R10	06/09/2019	RN	E	6"	P7 @ butt	08/09/2019	PASS	KH	Vac Box
R11	06/09/2019	RN	E	1'	p6 @ butt	08/09/2019	PASS	KH	Vac Box
R12	06/09/2019	RN	E	1'	p5 @ butt	08/09/2019	PASS	KH	Vac Box
R13	06/09/2019	RN	E	2 X 1'	p3 @ butt	08/09/2019	PASS	KH	Vac Box
R14	07/09/2019	RN	BO	6'	P22/P24 @ N toe	08/09/2019	PASS	KH	Vac Box
R15	07/09/2019	RN	P	3x2	P23/P25 @ S Trench	08/09/2019	PASS	KH	Vac Box
R16	07/09/2019	RN	BO	6"	P28/P30	08/09/2019	PASS	KH	Vac Box
R17	07/09/2019	RN	E	3 X 6"	P30 near cross	08/09/2019	PASS	KH	Vac Box
R18	07/09/2019	RN	BO	4'	P32/P34	08/09/2019	PASS	KH	Vac Box
R19	07/09/2019	RN	BO	6"	P34/P35	08/09/2019	PASS	KH	Vac Box
R20	07/09/2019	RN	P	3x3	P35/P36	08/09/2019	PASS	KH	Vac Box
R21	07/09/2019	RN	E	1'	P35/P36	08/09/2019	PASS	KH	Vac Box
R22	07/09/2019	RN	E	6"	P40 near cross	08/09/2019	PASS	KH	Vac Box
R23	07/09/2019	RN	P	3X2	P39/P40/P41	08/09/2019	PASS	KH	Vac Box
R24	07/09/2019	RN	E	2 X 6"	P42	08/09/2019	PASS	KH	Vac Box
R25	07/09/2019	RN	P	3X2	P43/P44	08/09/2019	PASS	KH	Vac Box
R26	07/09/2019	RN	BO	8'	P44/P45	08/09/2019	PASS	KH	Vac Box
R27	07/09/2019	RN	P	1X1	P44/P45	08/09/2019	PASS	KH	Vac Box
R28	08/09/2019	DP	E	13 X 6"	P63	08/09/2019	PASS	KH	Vac Box
R29	08/09/2019	DP	PT	7X5	P56	08/09/2019	PASS	KH	Vac Box
R30	08/09/2019	DP	P	1X1	P52/P53	08/09/2019	PASS	KH	Vac Box
R31	08/09/2019	DP	E	6"	P52	08/09/2019	PASS	KH	Vac Box
R32	08/09/2019	DP	E	1'	P51/P50	08/09/2019	PASS	KH	Vac Box
R33	08/09/2019	DP	E	2 X 6"	P50	08/09/2019	PASS	KH	Vac Box



DESTRUCTIVE TEST LOG

Project Name: BRADY LANDFILL

Sheet Type: 60mil HDPE

DT#: <u>1</u>			
Between Panels: <u>P15/P16</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>06/09/2019</u>			
Time: <u>245</u>			
INSIDE PEEL	129	200%+	F.T.B.
	120	200%+	F.T.B.
	115	200%+	F.T.B.
	122	200%+	F.T.B.
	130	200%+	F.T.B.
OUTSIDE PEEL	118	200%+	F.T.B.
	124	200%+	F.T.B.
	124	200%+	F.T.B.
	129	200%+	F.T.B.
	139	200%+	F.T.B.
SHEAR	130	200%+	F.T.B.
	136	200%+	F.T.B.
	142	200%+	F.T.B.
	140	200%+	F.T.B.
	140	200%+	F.T.B.

DT#: <u>2</u>			
Between Panels: <u>P16/P17</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>06/09/2019</u>			
Time: <u>305</u>			
INSIDE PEEL	128	200%+	F.T.B.
	125	200%+	F.T.B.
	128	200%+	F.T.B.
	128	200%+	F.T.B.
	137	200%+	F.T.B.
OUTSIDE PEEL	120	200%+	F.T.B.
	137	200%+	F.T.B.
	122	200%+	F.T.B.
	118	200%+	F.T.B.
	126	200%+	F.T.B.
SHEAR	144	200%+	F.T.B.
	140	200%+	F.T.B.
	165	200%+	F.T.B.
	144	200%+	F.T.B.
	150	200%+	F.T.B.

DT#: <u>3</u>			
Between Panels: <u>P23/P25</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>06/09/2019</u>			
Time: <u>320</u>			
INSIDE PEEL	126	200%+	F.T.B.
	126	200%+	F.T.B.
	119	200%+	F.T.B.
	114	200%+	F.T.B.
	115	200%+	F.T.B.
OUTSIDE PEEL	110	200%+	F.T.B.
	119	200%+	F.T.B.
	114	200%+	F.T.B.
	110	200%+	F.T.B.
SHEAR	143	200%+	F.T.B.
	146	200%+	F.T.B.
	144	200%+	F.T.B.
	159	200%+	F.T.B.
	139	200%+	F.T.B.

DT#: <u>4</u>			
Between Panels: <u>P25/P26</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>06/09/2019</u>			
Time: <u>340</u>			
INSIDE PEEL	122	200%+	F.T.B.
	128	200%+	F.T.B.
	122	200%+	F.T.B.
	115	200%+	F.T.B.
	120	200%+	F.T.B.
OUTSIDE PEEL	120	200%+	F.T.B.
	129	200%+	F.T.B.
	130	200%+	F.T.B.
	134	200%+	F.T.B.
	130	200%+	F.T.B.
SHEAR	150	200%+	F.T.B.
	145	200%+	F.T.B.
	147	200%+	F.T.B.
	146	200%+	F.T.B.
	134	200%+	F.T.B.



DESTRUCTIVE TEST LOG

Project Name: BRADY LANDFILL

Sheet Type: 60mil HDPE

DT# <u>5</u>			
Between Panels: <u>P26/P28</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>1020</u>			
INSIDE PEEL	127	200%+	F.T.B.
	133	200%+	F.T.B.
	118	200%+	F.T.B.
	125	200%+	F.T.B.
	145	200%+	F.T.B.
OUTSIDE PEEL	118	200%+	F.T.B.
	136	200%+	F.T.B.
	110	200%+	F.T.B.
	141	200%+	F.T.B.
	142	200%+	F.T.B.
SHEAR	155	200%+	F.T.B.
	146	200%+	F.T.B.
	148	200%+	F.T.B.
	144	200%+	F.T.B.
	142	200%+	F.T.B.

DT#: <u>6</u>			
Between Panels: <u>P28/P30</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>1035</u>			
INSIDE PEEL	129	200%+	F.T.B.
	124	200%+	F.T.B.
	123	200%+	F.T.B.
	129	200%+	F.T.B.
	108	200%+	F.T.B.
OUTSIDE PEEL	115	200%+	F.T.B.
	120	200%+	F.T.B.
	123	200%+	F.T.B.
	127	200%+	F.T.B.
	127	200%+	F.T.B.
SHEAR	160	200%+	F.T.B.
	147	200%+	F.T.B.
	156	200%+	F.T.B.
	155	200%+	F.T.B.
	152	200%+	F.T.B.

DT#: <u>7</u>			
Between Panels: <u>P30/P31</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>1052</u>			
INSIDE PEEL	117	200%+	F.T.B.
	129	200%+	F.T.B.
	136	200%+	F.T.B.
	131	200%+	F.T.B.
	132	200%+	F.T.B.
OUTSIDE PEEL	119	200%+	F.T.B.
	110	200%+	F.T.B.
	122	200%+	F.T.B.
	112	200%+	F.T.B.
	132	200%+	F.T.B.
SHEAR	144	200%+	F.T.B.
	149	200%+	F.T.B.
	142	200%+	F.T.B.
	146	200%+	F.T.B.
	150	200%+	F.T.B.

DT#: <u>8</u>			
Between Panels: <u>P31/P33</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>1110</u>			
INSIDE PEEL	133	200%+	F.T.B.
	120	200%+	F.T.B.
	126	200%+	F.T.B.
	137	200%+	F.T.B.
	129	200%+	F.T.B.
OUTSIDE PEEL	114	200%+	F.T.B.
	130	200%+	F.T.B.
	136	200%+	F.T.B.
	141	200%+	F.T.B.
	135	200%+	F.T.B.
SHEAR	148	200%+	F.T.B.
	145	200%+	F.T.B.
	142	200%+	F.T.B.
	140	200%+	F.T.B.
	138	200%+	F.T.B.



DESTRUCTIVE TEST LOG

Project Name: BRADY LANDFILL

Sheet Type: 60mil HDPE

DT#: <u>9</u>			
Between Panels: <u>P35/P36</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>430</u>			
INSIDE PEEL	139	200%+	F.T.B.
	111	200%+	F.T.B.
	136	200%+	F.T.B.
	124	200%+	F.T.B.
	123	200%+	F.T.B.
OUTSIDE PEEL	128	200%+	F.T.B.
	137	200%+	F.T.B.
	116	200%+	F.T.B.
	130	200%+	F.T.B.
SHEAR	120	200%+	F.T.B.
	146	200%+	F.T.B.
	143	200%+	F.T.B.
	134	200%+	F.T.B.
	140	200%+	F.T.B.
	141	200%+	F.T.B.

DT#: <u>10</u>			
Between Panels: <u>P36/P37</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>440</u>			
INSIDE PEEL	115	200%+	F.T.B.
	119	200%+	F.T.B.
	117	200%+	F.T.B.
	117	200%+	F.T.B.
	128	200%+	F.T.B.
	110	200%+	F.T.B.
OUTSIDE PEEL	117	200%+	F.T.B.
	118	200%+	F.T.B.
	118	200%+	F.T.B.
	120	200%+	F.T.B.
	120	200%+	F.T.B.
SHEAR	150	200%+	F.T.B.
	145	200%+	F.T.B.
	157	200%+	F.T.B.
	143	200%+	F.T.B.
	140	200%+	F.T.B.

DT#: <u>11</u>			
Between Panels: <u>P38/P40</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>455</u>			
INSIDE PEEL	104	200%+	F.T.B.
	135	200%+	F.T.B.
	120	200%+	F.T.B.
	135	200%+	F.T.B.
	128	200%+	F.T.B.
OUTSIDE PEEL	129	200%+	F.T.B.
	122	200%+	F.T.B.
	116	200%+	F.T.B.
	115	200%+	F.T.B.
	112	200%+	F.T.B.
SHEAR	146	200%+	F.T.B.
	143	200%+	F.T.B.
	144	200%+	F.T.B.
	148	200%+	F.T.B.
	149	200%+	F.T.B.

DT#: <u>12</u>			
Between Panels: <u>P39/P41</u>		ELONGATION	BREAK TYPE
QA Monitor: <u>KH</u>			
Date: <u>07/09/2019</u>			
Time: <u>509</u>			
INSIDE PEEL	116	200%+	F.T.B.
	129	200%+	F.T.B.
	120	200%+	F.T.B.
	111	200%+	F.T.B.
	132	200%+	F.T.B.
OUTSIDE PEEL	113	200%+	F.T.B.
	124	200%+	F.T.B.
	118	200%+	F.T.B.
	104	200%+	F.T.B.
	104	200%+	F.T.B.
SHEAR	147	200%+	F.T.B.
	144	200%+	F.T.B.
	136	200%+	F.T.B.
	145	200%+	F.T.B.
	149	200%+	F.T.B.



DESTRUCTIVE TEST LOG

Project Name: BRADY LANDFILL

Sheet Type: 60mil HDPE

DT#: 13		ELONGATION	BREAK TYPE
Between Panels:	P43/P44		
QA Monitor:	KH		
Date:	07/09/2019		
Time:	520		
INSIDE PEEL	117	200%+	F.T.B.
	120	200%+	F.T.B.
	128	200%+	F.T.B.
	118	200%+	F.T.B.
	125	200%+	F.T.B.
OUTSIDE PEEL	115	200%+	F.T.B.
	119	200%+	F.T.B.
	127	200%+	F.T.B.
	120	200%+	F.T.B.
SHEAR	106	200%+	F.T.B.
	137	200%+	F.T.B.
	139	200%+	F.T.B.
	135	200%+	F.T.B.
	142	200%+	F.T.B.
	141	200%+	F.T.B.

DT#: 14		ELONGATION	BREAK TYPE
Between Panels:	P44/P45		
QA Monitor:	KH		
Date:	07/-9/2019		
Time:	533		
INSIDE PEEL	125	200%+	F.T.B.
	119	200%+	F.T.B.
	128	200%+	F.T.B.
	132	200%+	F.T.B.
	125	200%+	F.T.B.
OUTSIDE PEEL	112	200%+	F.T.B.
	112	200%+	F.T.B.
	105	200%+	F.T.B.
	118	200%+	F.T.B.
SHEAR	116	200%+	F.T.B.
	137	200%+	F.T.B.
	148	200%+	F.T.B.
	146	200%+	F.T.B.
	142	200%+	F.T.B.
	144	200%+	F.T.B.

DT#: 15		ELONGATION	BREAK TYPE
Between Panels:	P45/P46		
QA Monitor:	KH		
Date:	07/09/2019		
Time:	545		
INSIDE PEEL	132	200%+	F.T.B.
	128	200%+	F.T.B.
	132	200%+	F.T.B.
	134	200%+	F.T.B.
	128	200%+	F.T.B.
OUTSIDE PEEL	133	200%+	F.T.B.
	146	200%+	F.T.B.
	135	200%+	F.T.B.
	140	200%+	F.T.B.
SHEAR	133	200%+	F.T.B.
	145	200%+	F.T.B.
	150	200%+	F.T.B.
	143	200%+	F.T.B.
	140	200%+	F.T.B.
	146	200%+	F.T.B.

DT#: 16		ELONGATION	BREAK TYPE
Between Panels:	P53/P54		
QA Monitor:	KH		
Date:	08/09/2019		
Time:	100		
INSIDE PEEL	123	200%+	F.T.B.
	123	200%+	F.T.B.
	112	200%+	F.T.B.
	121	200%+	F.T.B.
	126	200%+	F.T.B.
OUTSIDE PEEL	112	200%+	F.T.B.
	95	200%+	F.T.B.
	98	200%+	F.T.B.
	121	200%+	F.T.B.
SHEAR	107	200%+	F.T.B.
	139	200%+	F.T.B.
	147	200%+	F.T.B.
	145	200%+	F.T.B.
	148	200%+	F.T.B.
	144	200%+	F.T.B.



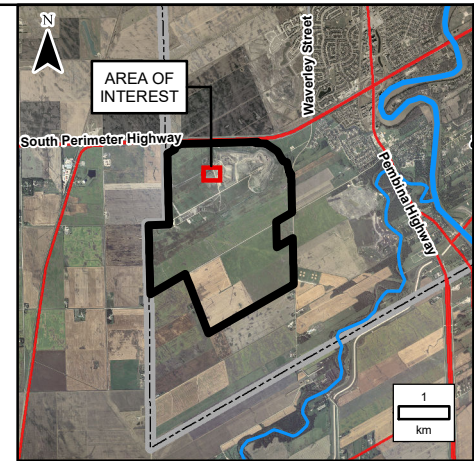
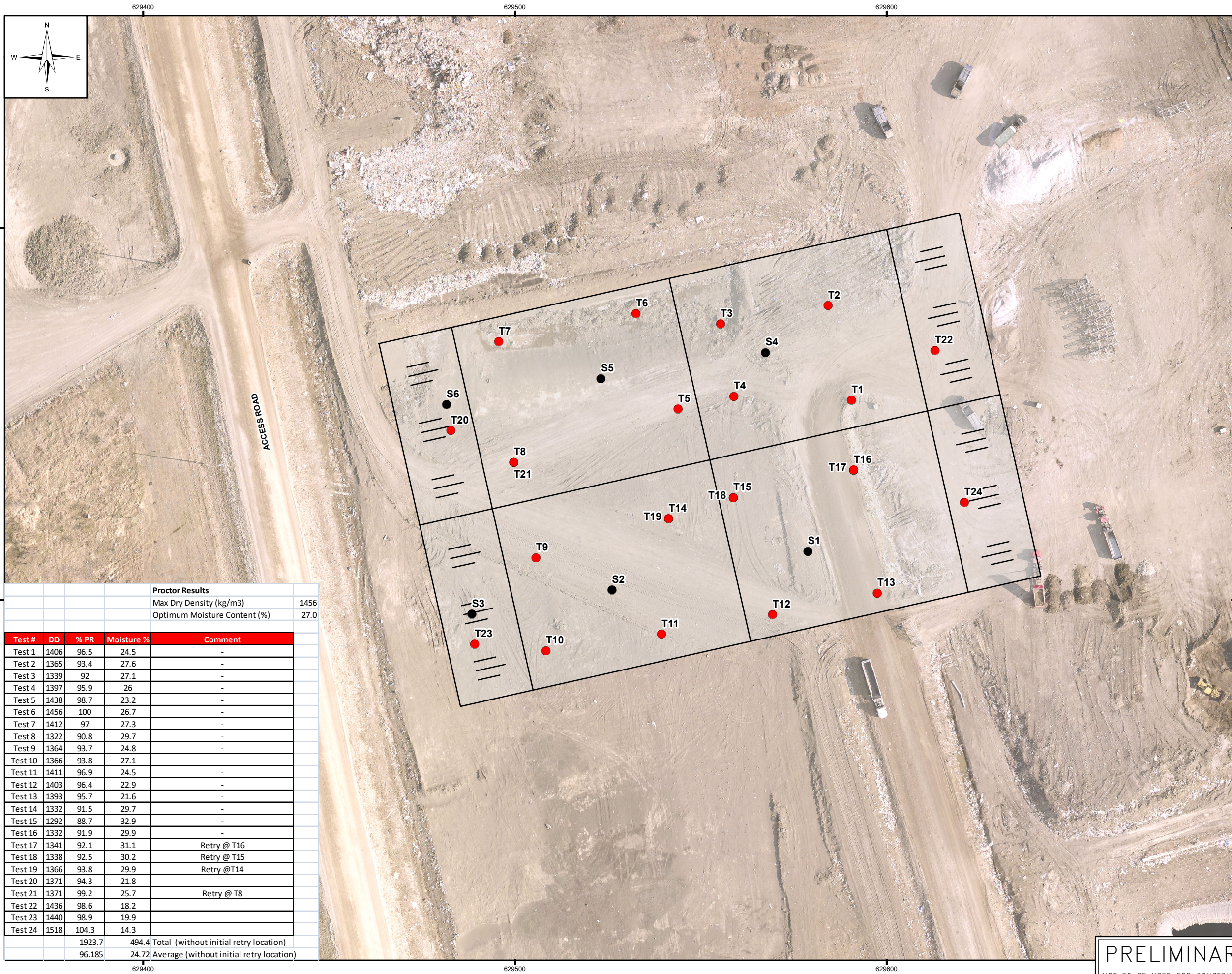
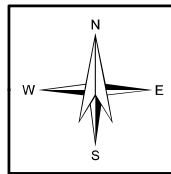
DESTRUCTIVE TEST LOG

Project Name: BRADY LANDFILL

Sheet Type: 60mil HDPE

DT#: <u>17</u>		ELONGATION	BREAK TYPE
Between Panels:	<u>P62/P63</u>		
QA Monitor:	<u>KH</u>		
Date:	<u>08/09/2019</u>		
Time:	<u>120</u>		
INSIDE PEEL	112	200%+	F.T.B.
	111	200%+	F.T.B.
	123	200%+	F.T.B.
	109	200%+	F.T.B.
	111	200%+	F.T.B.
OUTSIDE PEEL	113	200%+	F.T.B.
	106	200%+	F.T.B.
	115	200%+	F.T.B.
	120	200%+	F.T.B.
	116	200%+	F.T.B.
SHEAR	137	200%+	F.T.B.
	142	200%+	F.T.B.
	153	200%+	F.T.B.
	145	200%+	F.T.B.
	150	200%+	F.T.B.

DT#: _____		ELONGATION	BREAK TYPE
Between Panels:	_____		
QA Monitor:	_____		
Date:	_____		
Time:	_____		
INSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
OUTSIDE PEEL		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
SHEAR		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.
		200%+	F.T.B.



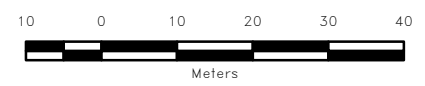
LEGEND:

- Densometer Test Location
- Shelby Tube Location
- Excavation Dimensions

NOTES:

1. Imagery shown from City of Winnipeg Open Data Portal and dated as 2018.
2. All units are metric and in metres unless otherwise specified. Transverse Mercator Projection, NAD 1983, Zone 14. Elevations are in metres above sea level (MSL).

DRAFT



SCALE: 1:1,000 METRIC 11"x17"

Test #	DD	% PR	Moisture %	Comment
Test 1	1406	96.5	24.5	-
Test 2	1365	93.4	27.6	-
Test 3	1339	92	27.1	-
Test 4	1397	95.9	26	-
Test 5	1438	98.7	23.2	-
Test 6	1456	100	26.7	-
Test 7	1412	97	27.3	-
Test 8	1322	90.8	29.7	-
Test 9	1364	93.7	24.8	-
Test 10	1366	93.8	27.1	-
Test 11	1411	96.9	24.5	-
Test 12	1403	96.4	22.9	-
Test 13	1393	95.7	21.6	-
Test 14	1332	91.5	29.7	-
Test 15	1292	88.7	32.9	-
Test 16	1332	91.9	29.9	-
Test 17	1341	92.1	31.1	Retry @ T16
Test 18	1338	92.5	30.2	Retry @ T15
Test 19	1366	93.8	29.9	Retry @ T14
Test 20	1371	94.3	21.8	-
Test 21	1371	99.2	25.7	Retry @ T8
Test 22	1436	98.6	18.2	-
Test 23	1440	98.9	19.9	-
Test 24	1518	104.3	14.3	-
			1923.7	494.4 Total (without initial retry location)
			96.185	24.72 Average (without initial retry location)

Proctor Results	
Max Dry Density (kg/m ³)	1456
Optimum Moisture Content (%)	27.0

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

X	19/09/05	FOR INTERNAL USE ONLY	---	---
NO.	YY/MM/DD	DESCRIPTION	ISSUED BY	CHECK BY

REVISIONS / ISSUE

KGS
GROUP
CONSULTING
ENGINEERS

BRADY ROAD RESOURCE MANAGEMENT FACILITY – CELL 32 CONSTRUCTION

GEOTECHNICAL QUALITY ASSURANCE

September 20, 2019
File: 123314413

Attention: Mr. Andrew Sinclair
KGS Group Inc.
3rd Floor – 865 Waverley St.
Winnipeg, Manitoba
R3T 5P4

Good day Andrew,

Reference: Brady Landfill Cell 32 (15-0107-014)

On September 4, 2019, two (2) soil samples were submitted to our laboratory for analysis. The following tests were conducted on select soil samples:

- ASTM D4318 - *Liquid Limit, Plastic Limit, and Plasticity Index of Soils*
- ASTM D5084 - *Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter*

The resulting test data is attached.

We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

Regards,

Stantec Consulting Ltd.



Larry Presado, C.Tech.
Senior Geotechnical Technologist

Phone: (204) 488-6999
larry.presado@stantec.com



Jason Thompson, C.E.T.
Principal – Manager, Materials Testing Services

Phone: (204) 928-4004
jason.thompson@stantec.com

Attachment: Table 1 – Atterberg Limits Test Data
2 x Atterberg Limits Reports
2 x Hydraulic Conductivity Reports

Reference: Brady Landfill Cell 32 (15-0107-014)

TABLE 3 – ATTERBERG LIMITS TEST DATA

Field Sample ID	Liquid Limit	Plastic Limit	Plasticity Index	As Rec'd Water Content (%)
Shelby #1	98	28	70	56.5
Shelby #5	97	29	68	47.4



Atterberg Limits
 ASTM D4318
 Method A- Multi-Point

Client: KGS Group Inc.
 Project Name: Brady Landfill Cell 32
(15-0107-014)
 Project No: 123314413
 Date Received: September 4, 2019
 Date Tested: September 11, 2019
 Tested By: Donald Eliazar

LABORATORY

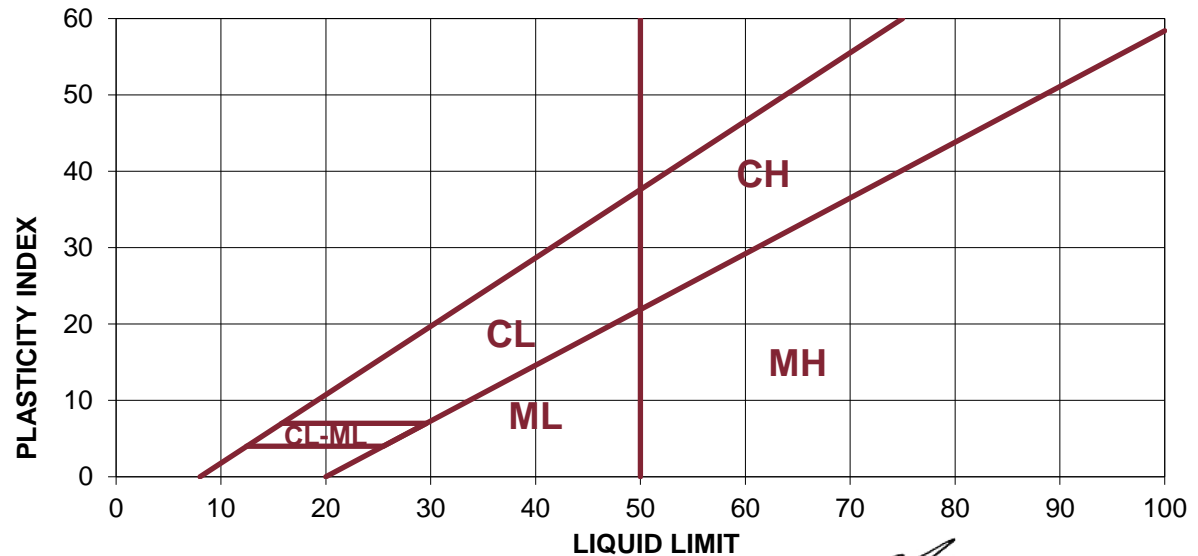
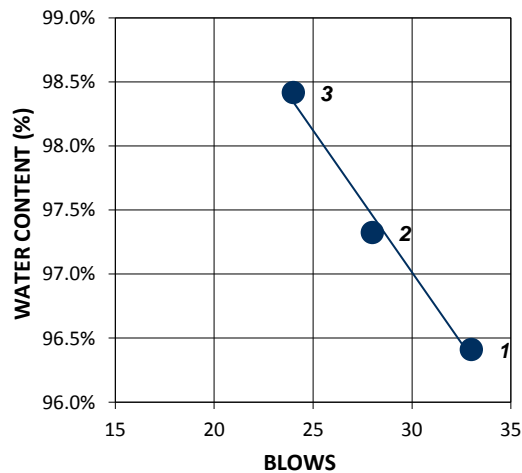
199 Henlow Bay

Winnipeg, Manitoba
 Canada R3Y 1G4
 Tel: (204) 488-6999

Sample : Shelby #1

LIQUID LIMIT				PLASTIC LIMIT		
Trial	1	2	3	Trial	1	2
No. of Blows	33	28	24	Tare No.	264	238
Tare No.	160	265	153	Wt. Sa. (wet+tare)(g)	27.19	27.58
Wt. Sa. (wet+tare)(g)	48	49	49	Wt. Sa. (dry+tare)(g)	25.44	25.95
Wt. Sa. (dry+tare)(g)	33	35	34	Wt. Tare (g)	19.31	20.19
Wt. Tare (g)	18	20	19	Wt. Dry Soil (g)	6.1	5.8
Wt. Dry Soil (g)	15.0	15.0	15.2	Wt. Water (g)	1.8	1.6
Wt. Water (g)	14.5	14.6	14.9	Water Content (%)	28.5%	28.3%
Water Content (%)	96.4%	97.3%	98.4%			

RESULTS	
LL	98
PL	28
PI	70
Natural MC (%)	
56.5%	



Reviewed By: Jason Thompson, C.E.T.

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request. The data presented above is for the sole use of the client stipulated above. STANTEC is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of STANTEC.



Atterberg Limits
 ASTM D4318
 Method A- Multi-Point

Client: KGS Group Inc.
 Project Name: Brady Landfill Cell 32
(15-0107-014)
 Project No: 123314413
 Date Received: September 4, 2019
 Date Tested: September 11, 2019
 Tested By: Donald Eliazar

LABORATORY

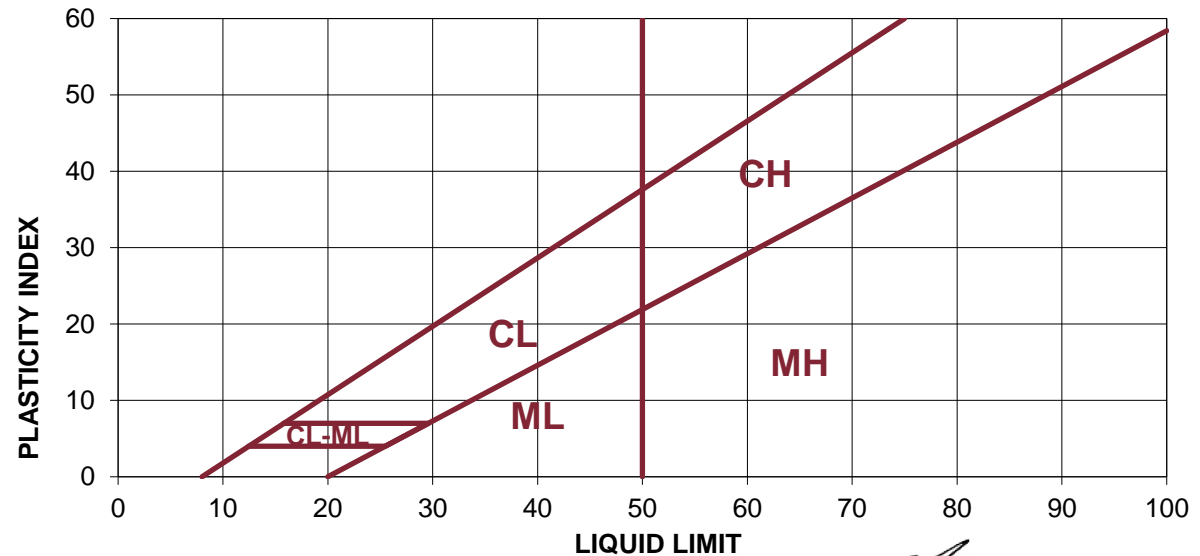
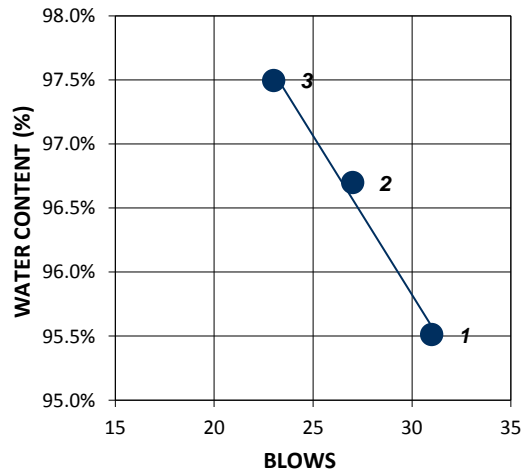
199 Henlow Bay

Winnipeg, Manitoba
 Canada R3Y 1G4
 Tel: (204) 488-6999

Sample : Shelby #5

LIQUID LIMIT				PLASTIC LIMIT		
Trial	1	2	3	Trial	1	2
No. of Blows	31	27	23	Tare No.	186	217
Tare No.	258	275	166	Wt. Sa. (wet+tare)(g)	28.58	28.15
Wt. Sa. (wet+tare)(g)	49	50	54	Wt. Sa. (dry+tare)(g)	26.47	25.96
Wt. Sa. (dry+tare)(g)	34	36	37	Wt. Tare (g)	19.14	18.23
Wt. Tare (g)	19	21	19	Wt. Dry Soil (g)	7.3	7.7
Wt. Dry Soil (g)	15.4	15.1	17.6	Wt. Water (g)	2.1	2.2
Wt. Water (g)	14.7	14.6	17.1	Water Content (%)	28.8%	28.3%
Water Content (%)	95.5%	96.7%	97.5%			

RESULTS	
LL	97
PL	29
PI	68
Natural MC (%)	
47.4%	



Reviewed By: Jason Thompson, C.E.T.

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Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999

ASTM D5084 - MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

TO KGS Group Inc.
 3rd Floor - 865 Waverley St.
 Winnipeg, Manitoba
 R3T 5P4

PROJECT Brady Landfill Cell 32 (15-0107-014)

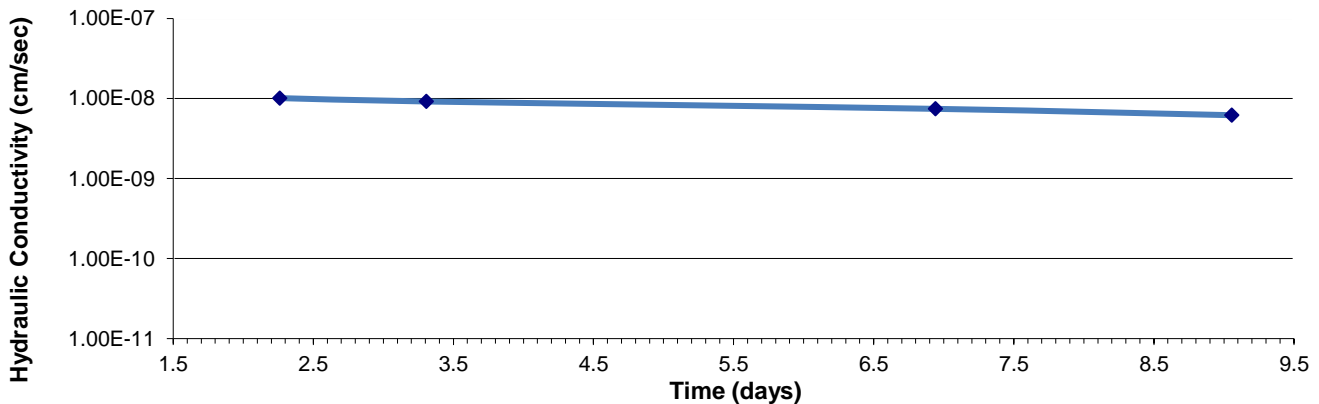
PROJECT NO. 123314413

ATTN: Andrew Sinclair

REPORT NO. 1

SAMPLE ID: Shelby #1 - Clay Liner
 SOIL DESCRIPTION: Clay, brown, stiff, moist, high plasticity, trace silt
 DATE TESTED: September 9 to September 18, 2019
 CONFINING PRESSURE (kPa): 137.9
 EFFECTIVE SATURATION STRESS (kPa): 34.5
 ASSUMED SPECIFIC GRAVITY: 2.71
 HYDRAULIC GRADIENT: 18.4
 TYPE OF PERMEANT LIQUID: De-aired Water
 HYDRAULIC CONDUCTIVITY, "k" (cm/s): 8.0E-09
 HYDRAULIC CONDUCTIVITY, "k₂₀" (cm/s): 7.7E-09

	Height (mm)	Diameter (mm)	Wet Mass (g)	Dry Density (g/cm ³)	Water Content by Mass (%)	Water Content by Volume (%)	Saturation (%)
Initial Reading	77.6	70.9	538.3	1.252	40.4	50.6	94.1
Final Reading	80.9	72.3	565.8	1.094	55.7	60.9	102.1



COMMENTS:

REPORT DATE: 2019.Sep.20

REVIEWED BY  Jason Thompson, C.E.T.

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request. The data presented above is for the sole use of the client stipulated above. Stantec is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of Stantec.



Stantec Consulting Ltd.
 199 Henlow Bay, Winnipeg, MB R3Y 1G4
 Tel: (204) 488-6999

ASTM D5084 - MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

TO KGS Group Inc.
 3rd Floor - 865 Waverley St.
 Winnipeg, Manitoba
 R3T 5P4

PROJECT Brady Landfill Cell 32 (15-0107-014)

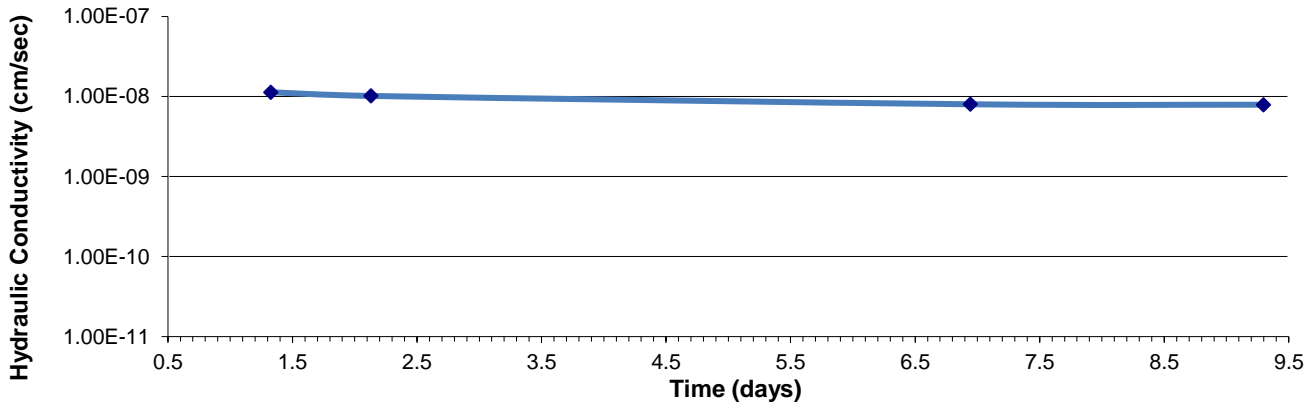
PROJECT NO. 123314413

ATTN: Andrew Sinclair

REPORT NO. 2

SAMPLE ID: Shelby #5 - Clay Liner
 SOIL DESCRIPTION: Clay, brown, stiff, moist, high plasticity
 DATE TESTED: September 9 to September 18, 2019
 CONFINING PRESSURE (kPa): 137.9
 EFFECTIVE SATURATION STRESS (kPa): 34.5
 ASSUMED SPECIFIC GRAVITY: 2.71
 HYDRAULIC GRADIENT: 18.8
 TYPE OF PERMEANT LIQUID: De-aired Water
 HYDRAULIC CONDUCTIVITY, "k" (cm/s): 9.7E-09
 HYDRAULIC CONDUCTIVITY, "k₂₀" (cm/s): **9.4E-09**

	Height (mm)	Diameter (mm)	Wet Mass (g)	Dry Density (g/cm ³)	Water Content by Mass (%)	Water Content by Volume (%)	Saturation (%)
Initial Reading	77.1	70.7	566.2	1.369	36.5	49.9	100.9
Final Reading	79.0	72.5	587.9	1.263	42.5	53.7	100.5



COMMENTS:

REPORT DATE: 2019.Sep.20


 REVIEWED BY Jason Thompson, C.E.T.

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request. The data presented above is for the sole use of the client stipulated above. Stantec is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of Stantec.

PROCTOR TEST REPORT

TO KGS Group Inc.
3rd Floor - 865 Waverley St
Winnipeg, MB
R3T 5P4

CLIENT KGS Group Inc.
C.C.

ATTN: Andrew Sinclair

PROJECT Cell 32 Project

PROJECT NO. 123314413

PROCTOR NO. 1

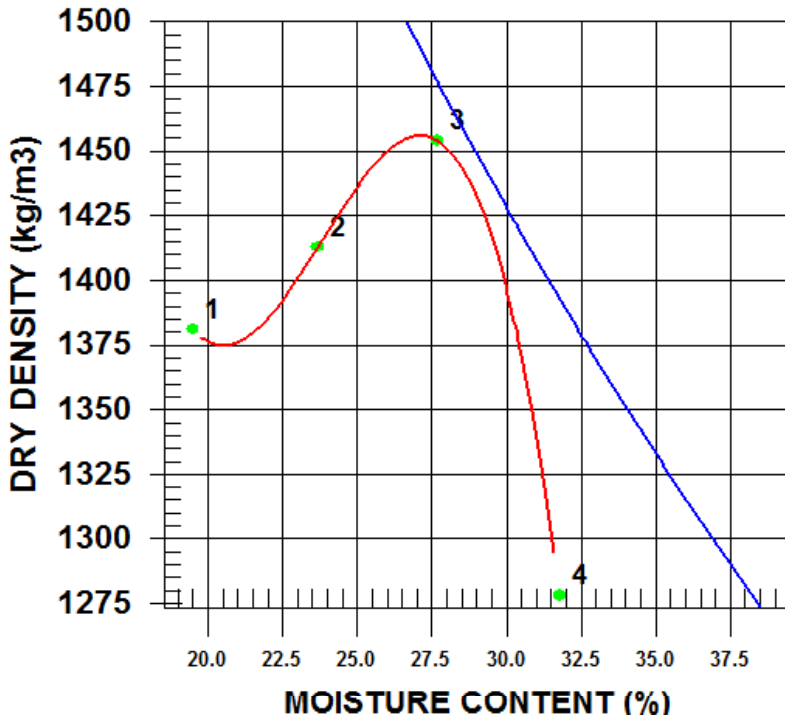
DATE SAMPLED 2019.Jul.30

DATE RECEIVED 2019.Jul.31

DATE TESTED 2019.Aug.06

INSITU MOISTURE 44.2 %
TESTED BY Matthew Moniz
MATERIAL IDENTIFICATION
MATERIAL USE Clay Liner
MAX. NOMINAL SIZE
MATERIAL TYPE Silty Clay
SUPPLIER
SOURCE Existing Material

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m ³)	DRY DENSITY (kg/m ³)	MOISTURE CONTENT (%)
1	1650	1381	19.5
2	1748	1413	23.7
3	1857	1454	27.7
4	1685	1278	31.8

	MAXIMUM DRY DENSITY (kg/m ³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1456	27.0
OVERSIZE CORRECTED		

COMMENTS