Appendix SRA3-3: Capping System Veneer Stability Analysis

Capping System Interface Stability

Input Parameters				PEAK VALUES Case 1	PEAK VALUES Case 2	RESIDUAL VALUES Case 1	RESIDUAL VALUES Case 2
				1V:5H	**1V:4H**	**1V:5H**	**1V:4H**
β	Slope Angle		°	11.31	14.04	11.31	14.04
H	Slope height		m	17.00	17.00	17.00	17.00
h	Thickness of cover soils		m	1.30	1.30	1.30	1.30
ϕ	Friction angle of cover soil		°	27.00	27.00	27.00	27.00
c	Cohesion of cover soil		kPa	0.50	0.50	0.50	0.50
δct	Restoration soils / LLDPE	Friction Angle	°	24.00	24.00	18.00	18.00
αct	Restoration soils / LLDPE	Cohesion	kPa	0.00	0.00	0.00	0.00
δtg	LLDPE / Regulation soils	Friction Angle	°	24.00	24.00	18.00	18.00
αtg	LLDPE / Regulation soils	Cohesion	kPa	0.00	0.00	0.00	0.00
PSR	Parallel Submerged Ratio	PSR		0.40	0.40	0.40	0.40
γ_d	Dry unit weight of cover soil		kN	16.00	16.00	16.00	16.00
γ_{sat}	Saturated weight of cover soil		kN	18.00	18.00	18.00	18.00
h_w	Thickness of saturated cover soil		m	**0.52**	**0.52**	**0.52**	**0.52**
W_A	Weight of active wedge		kN	**1821.44**	**1471.83**	**1821.44**	**1471.83**
W_P	Weight of passive wedge		kN	**71.71**	**58.59**	**71.71**	**58.59**
U_n	Resultant pore water pressure perpendicular to slope		kN	**435.10**	**347.93**	**435.10**	**347.93**
U_h	Resultant pore water pressure on interwedge surface		kN	**1.35**	**1.35**	**1.35**	**1.35**
N_{Aab}	Effective force normal to failure plane of active wedge above impermeable layer		kN	**1351.23**	**1080.26**	**1351.23**	**1080.26**
N_{Abb}	Effective force normal to failure plane of active wedge below impermeable layer		kN	**1786.34**	**1428.19**	**1786.34**	**1428.19**
U_v	Resultant vertical pore water pressure acting on passive wedge		kN	**6.76**	**5.41**	**6.76**	**5.41**
L	Slope Length		m	**86.68**	**70.07**	**86.68**	**70.07**
Restoration soils / LLDPE							
	Quadratic Equation Parameters	a		350.33	346.48	350.33	346.48
		b		-661.90	-540.35	-502.49	-414.27
		c		60.12	59.45	43.87	43.39
	Factor of Safety Against Failure			**1.79**	**1.44**	**1.34**	**1.08**
	Tension in Geostextile		**kN**	**-365.72**	**-202.12**	**-153.36**	**-35.60**
				No Tension	**No Tension**	**No Tension**	**No Tension**
LLDPE / Regulation soils							
	Quadratic Equation Parameters	a		350.33	346.48	350.33	346.48
		b		-661.90	-540.35	-502.49	-414.27
		c		60.12	59.45	43.87	43.39
	Factor of Safety Against Failure			**1.79**	**1.44**	**1.34**	**1.08**
	Tension in LLDPE Geomembrane		**kN**	**-365.72**	**-202.12**	**-153.36**	**-35.60**
				No Tension	**No Tension**	**No Tension**	**No Tension**

N.B. This calculation assumes friction angles and cohesion as published in the Loughborough University report.

		SLR	Site	**Parrys Quarry Landfill**	
			Project	Stability Risk Assessment	
			Date	Nov-18	Scale: NTS
			Drawing	**Stability Analysis**	Table **SRA3-3**