

Area of landfill surface (m2)		67000							
Area of landfill base (m2)		64500							
Normal Scenario		Rainfall (mm/yr)	Rainfall (m/s)	Base hydraulic conductivity (m/s)	Rain infiltration m3/s	Rain infiltration m3/yr	Basal Seepage Q (m3/s)	Basal Seepage Q (m3/yr)	Ratio base : rainfall seepage
Rainfall infiltration -		521	1.65E-08		1.11E-03	3.49E+04			
Seepage through the base				1.00E-07			6.45E-03	2.03E+05	6

Rainfall reduced by restoration soils and profile

Rainfall infiltration		100	3.17E-09	1.00E-07	2.12E-04	6.70E+03	6.45E-03	2.03E+05	30
Rainfall infiltration		150	4.76E-09	1.00E-07	3.19E-04	1.01E+04	6.45E-03	2.03E+05	20
Rainfall infiltration		250	7.93E-09	1.00E-07	5.31E-04	1.68E+04	6.45E-03	2.03E+05	12

Decreased basal hydraulic conductivity

Basal seepage		250	7.93E-09	5.00E-08	5.31E-04	1.68E+04	3.23E-03	1.02E+05	6.07
Basal seepage		250	7.93E-09	1.00E-08	5.31E-04	1.68E+04	6.45E-04	2.03E+04	1.21
Basal seepage		250	7.93E-09	8.00E-09	5.31E-04	1.68E+04	5.16E-04	1.63E+04	0.97
Basal seepage		250	7.93E-09	7.00E-09	5.31E-04	1.68E+04	4.52E-04	1.42E+04	0.85
Basal seepage		250	7.93E-09	5.00E-09	5.31E-04	1.68E+04	3.23E-04	1.02E+04	0.61
Basal seepage		250	7.93E-09	1.00E-09	5.31E-04	1.68E+04	6.45E-05	2.03E+03	0.12

When there is no head of leachate at the base of the site the hydraulic gradient across the mineral liner is 1

If leachate head is allowed to build up to 1m, the rate of basal seepage will double over a 1m thick liner

Leachate head increases to 1m - basal seepage rate doubles

Basal seepage		250	7.93E-09	5.00E-08	5.31E-04	1.68E+04	6.45E-03	4.07E+05	12.14
Basal seepage		250	7.93E-09	1.00E-08	5.31E-04	1.68E+04	1.29E-03	8.14E+04	2.43
Basal seepage		250	7.93E-09	7.00E-09	5.31E-04	1.68E+04	9.03E-04	5.70E+04	1.70
Basal seepage		250	7.93E-09	5.00E-09	5.31E-04	1.68E+04	6.45E-04	4.07E+04	1.21
Basal seepage		250	7.93E-09	3.00E-09	5.31E-04	1.68E+04	3.87E-04	2.44E+04	0.73
Basal seepage		250	7.93E-09	1.00E-09	5.31E-04	1.68E+04	1.29E-04	8.14E+03	0.24

Leachate head increases to 2m - hydraulic gradient = 3/1, basal seepage is 3 times higher than with no head of leachate

Basal seepage		250	7.93E-09	5.00E-08	5.31E-04	1.68E+04	9.68E-03	9.15E+05	18.22
Basal seepage		250	7.93E-09	1.00E-08	5.31E-04	1.68E+04	1.94E-03	1.83E+05	3.64
Basal seepage		250	7.93E-09	7.00E-09	5.31E-04	1.68E+04	1.35E-03	1.28E+05	2.55
Basal seepage		250	7.93E-09	5.00E-09	5.31E-04	1.68E+04	9.68E-04	9.15E+04	1.82
Basal seepage		250	7.93E-09	3.00E-09	5.31E-04	1.68E+04	5.81E-04	5.49E+04	1.09
Basal seepage		250	7.93E-09	1.00E-09	5.31E-04	1.68E+04	1.94E-04	1.83E+04	0.36