

APPENDIX B

Summary of Hydraulic Conductivity Measurements

WM Richmond Landfill - Summary of Hydraulic Conductivity Measurements

Monitor*	Easting	Northing	Type	Ground Elev. (masl)	Bedrock Elev. (masl)	Monitor Top Elev. (masl)	Monitor Bottom Elev. (masl)	Monitor Middle Elevation (masl)	Hydraulic Conductivity (m/s)	Date Tested	Comments
2054	335293	4902797	Open Borehole	128	121.90	120.68	91.40	106.04	5.00E-07	1991	bulk hydraulic conductivity
M1-1	335244	4902858	GW Monitor	128.29	121.29	116.79	115.29	116.04	3.00E-07	1991	graphically derived
M1-2	335244	4902858	GW Monitor	128.29	121.29	102.79	97.79	100.29	< 1.00E-09	1991	no measurable response
M2-1	335090	4902848	GW Monitor	128.84	121.24	100.84	98.34	99.59	5.00E-08	1991	graphically derived
M2-2	335090	4902848	GW Monitor	128.84	121.24	110.84	109.34	110.09	< 1.00E-09	1991	no measurable response
M2-3	335090	4902848	GW Monitor	128.84	121.24	116.84	115.34	116.09	2.00E-08	1991	graphically derived
M3-1	334994	4902913	GW Monitor	126.86	122.16	98.86	96.36	97.61	> 1.00E-05	1991	qualitative evaluation
M3-2	334994	4902913	GW Monitor	126.86	122.16	112.36	110.86	111.61	< 1.00E-07	1991	qualitative evaluation
M3-3	334994	4902913	GW Monitor	126.86	122.16	118.86	117.36	118.11	< 1.00E-07	1991	qualitative evaluation
M3A-1	334990	4902928	GW Monitor	126.96	122.00	98.16	95.66	96.91	< 5.00E-10	1998	data extrapolation
M3A-3	334990	4902930	GW Monitor	126.96	122.00	117.96	115.96	116.96	1.00E-08	1998	graphical extrapolation
M4-1	335006	4903036	GW Monitor	125.64	122.64	98.34	95.34	96.84	< 1.00E-09	1991	dry
M4-2	335006	4903038	GW Monitor	125.64	122.64	104.64	102.14	103.39	< 1.00E-09	1991	no measurable response
M4-3	335006	4903038	GW Monitor	125.64	122.64	117.14	115.64	116.39	8.00E-08	1991	graphically derived
M5-1	335003	4903162	GW Monitor	123.2	122.44	96.70	92.60	94.65	< 1.00E-09	1991	no measurable response
M5-2	335003	4903163	GW Monitor	123.2	122.44	102.70	99.70	101.20	4.00E-08	1991	graphically derived
M5-3	335003	4903163	GW Monitor	123.2	122.44	117.20	115.70	116.45	> 1.00E-05	1991	rapid recovery
M6-1	335200	4903172	GW Monitor	123.73	122.23	96.23	92.93	94.58	< 1.00E-09	1991	dry
M6-2	335201	4903174	GW Monitor	123.73	122.23	102.23	100.23	101.23	< 1.00E-09	1991	dry
M6-3	335201	4903174	GW Monitor	123.73	122.23	118.73	117.23	117.98	< 1.00E-09	1991	no measurable recovery
M7-2	335424	4903179	GW Monitor	125.28	122.08	110.28	108.78	109.53	< 1.00E-09	1991	no measurable recovery
M7-3	335424	4903179	GW Monitor	125.28	122.08	118.78	115.28	117.03	< 1.00E-09	1991	no measurable recovery
M8-1	335492	4902953	GW Monitor	127.98	122.08	100.48	97.83	99.16	< 1.00E-09	1991	no measurable recovery
M8-3	335492	4902953	GW Monitor	127.98	122.08	116.68	114.48	115.58	> 1.00E-05	1991	rapid recovery
M9-1	335410	4902787	GW Monitor	124.8	121.90	96.80	94.60	95.70	< 1.00E-09	1991	no measureable recovery
M9-3	335410	4902789	GW Monitor	124.8	121.90	115.50	114.00	114.75	> 1.00E-05	1991	rapid recovery
M10-2	335494	4902596	GW Monitor	126.47	123.47	114.47	112.47	113.47	< 1.00E-09	1991	no measurable response
M10-3	335494	4902594	GW Monitor	126.47	123.47	119.97	116.97	118.47	6.00E-09	1991	graphically derived
M11-1	335523	4903064	GW Monitor	124.89	122.79	96.89	94.59	95.74	> 1.00E-05	1991	rapid recovery
M11-2	335523	4903064	GW Monitor	124.89	122.79	106.64	101.39	104.01	< 1.00E-09	1991	no measurable response
M11-3	335523	4903064	GW Monitor	124.89	122.79	116.39	114.14	115.26	9.00E-09	1991	graphically derived
M12	335500	4902596	GW Monitor	126.49	123.70	123.99	123.59	123.79	8.00E-06	1991	graphically derived
M13	335401	4902788	GW Monitor	124.9	122.17	122.70	122.30	122.50	9.00E-07	1991	graphically derived
M13	335401	4902788	GW Monitor	124.9	122.17	122.70	122.30	122.50	9.28E-07	1991	
M16	335447	4902710	GW Monitor	124.83	121.83	122.43	121.83	122.13	1.00E-05	1991	graphically derived
M17	335475	4902837	GW Monitor	125.63	123.01	123.43	123.13	123.28	2.00E-06	1991	graphically derived
M19	335632	4902944	GW Monitor	129.84	124.76	125.64	125.04	125.34	1.00E-06	1991	graphically derived
M20	335556	4902915	GW Monitor	128.19	122.81	123.49	122.89	123.19	< 1.00E-09	1991	no measurable response
M20	335556	4902915	GW Monitor	128.19	122.81	123.49	122.89	123.19	< 1.00E-09	1991	no reponse after slug rise
M22	335535	4902968	GW Monitor	128.56	122.79	124.06	122.79	123.42	7.00E-08	1991	graphical extrapolation
M23	335602	4903049	GW Monitor	127.82	123.45	124.22	123.42	123.82	< 1.00E-09	1991	too little water
M24	335242	4902862	GW Monitor	128.08	121.30	122.28	121.30	121.79	3.00E-06	1991	graphically derived
M24	335242	4902862	GW Monitor	128.08	121.30	122.28	121.30	121.79	3.49E-06	1991	
M25	335177	4902837	GW Monitor	128.84	121.35	122.14	121.35	121.74	9.00E-07	1991	graphically derived
M26-1	335092	4902845	GW Monitor	128.83	121.63	122.53	121.63	122.08	1.00E-05	1991	graphical extrapolation
M26-2	335096	4902845	GW Monitor	128.91	121.71	125.81	125.41	125.61	9.00E-07	1991	graphically derived
M27	334997	4902908	GW Monitor	127.16	122.13	122.86	122.26	122.56	5.00E-07	1991	graphically derived
M28	334897	4902853	GW Monitor	127.44	122.18	122.94	122.34	122.64	5.00E-07	1991	graphically derived
M28	334897	4902853	GW Monitor	127.44	122.18	122.94	122.34	122.64	5.22E-07	1991	water level fell in steps
M29	334924	4902983	GW Monitor	124.54	122.13	122.44	122.14	122.29	2.00E-07	1991	graphically derived
M30	334999	4903033	GW Monitor	125.74	122.36	122.74	122.36	122.55	5.00E-07	1991	graphically derived
M31	334857	4902977	GW Monitor	124.44	122.46	122.94	122.54	122.74	< 1.00E-09	1991	no measurable response
M34	335511	4903063	GW Monitor	125.11	122.57	122.11	121.81	121.96	1.00E-06	1991	graphically derived
M35	335458	4903336	GW Monitor	124.49	122.89	123.20	122.89	123.04	< 1.00E-09	1991	too little water
M36	335477	4903190	GW Monitor	124.96	122.90	123.21	122.90	123.06	4.00E-07	1991	graphically derived
M37	335449	4903163	GW Monitor	124.95	122.54	122.85	122.54	122.69	1.00E-06	1991	graphically derived
M38	335006	4902978	GW Monitor	125.99	122.38	122.69</					

Monitor*	Easting	Northing	Type	Ground Elev. (masl)	Bedrock Elev. (masl)	Monitor Top Elev. (masl)	Monitor Bottom Elev. (masl)	Monitor Middle Elevation (masl)	Hydraulic Conductivity (m/s)	Date Tested	Comments
M66-1	335154	4903218	GW Monitor	123.54	122.04	120.54	119.14	119.84	< 1.00E-09	1999	not enough water
M66-2	335155	4903219	GW Monitor	123.54	122.04	122.24	121.54	121.89	1.00E-08	1999	graphically derived
M67-1	334799	4903089	GW Monitor	123.11	121.61	120.01	119.71	119.86	< 5.00E-10	1999	data extrapolation
M67-2	334799	4903090	GW Monitor	123.11	121.61	121.61	120.91	121.26	5.00E-08	1999	graphical extrapolation
M68-1	335670	4903504	GW Monitor	124.29	122.16	66.29	63.33	64.81	4.00E-08	1999	graphical extrapolation
M68-2	335671	4903502	GW Monitor	124.39	122.26	96.89	94.39	95.64	< 5.00E-08	1998	data extrapolation
M68-3	335671	4903500	GW Monitor	124.41	122.28	112.41	109.91	111.16	< 1.00E-08	1998	data extrapolation
M68-4	335672	4903499	GW Monitor	124.43	122.30	124.43	122.93	123.68	> 1.00E-04	1999	data extrapolation
M69-1	335062	4904299	GW Monitor	125.93	124.08	80.93	78.43	79.68	1.00E-07	1998	graphical extrapolation
M69-1	335062	4904299	GW Monitor	125.93	124.08	80.93	78.43	79.68	3.00E-08	1998	graphical extrapolation
M69-2	335063	4904298	GW Monitor	125.91	124.06	99.41	96.91	98.16	< 1.00E-09	1998	data extrapolation
M69-3	335063	4904296	GW Monitor	125.96	124.11	113.96	110.96	112.46	< 1.00E-09	1998	data extrapolation
M69-4	335064	4904295	GW Monitor	125.94	124.09	124.94	124.64	124.79	1.00E-07	1998	graphically derived
M70-1	335890	4902862	GW Monitor	127.2	124.76	99.70	96.30	98.00	< 5.00E-10	1999	data extrapolation
M70-2	335891	4902860	GW Monitor	127.05	124.61	115.05	113.55	114.30	1.00E-08	1998	graphically derived
M70-3	335891	4902858	GW Monitor	127.12	124.68	126.12	125.82	125.97	3.00E-07	1999	graphically derived
M71	335390	4902773	GW Monitor	125.26	121.80	108.81	106.21	107.51	3.00E-05	2000	
M71-P01	335390	4902773	Packer Test	125.26	121.80	121.19	118.85	120.02	3.00E-06	2000	
M71-P02	335390	4902773	Packer Test	125.26	121.80	120.50	118.16	119.33	7.00E-10	2000	
M71-P03	335390	4902773	Packer Test	125.26	121.80	118.16	115.91	117.03	6.00E-10	2000	
M71-P04	335390	4902773	Packer Test	125.26	121.80	115.91	113.66	114.78	7.00E-09	2000	
M71-P05	335390	4902773	Packer Test	125.26	121.80	113.66	111.32	112.49	3.00E-08	2000 (dupl.)	
M71-P06	335390	4902773	Packer Test	125.26	121.80	111.32	109.07	110.19	3.00E-09	2000	
M71-P07	335390	4902773	Packer Test	125.26	121.80	109.07	106.73	107.90	8.00E-06	2000	
M71-P08	335390	4902773	Packer Test	125.26	121.80	106.73	104.48	105.60	9.00E-06	2000 (dupl.)	
M71-P09	335390	4902773	Packer Test	125.26	121.80	106.73	104.48	105.60	7.00E-06	2000	
M71-P10	335390	4902773	Packer Test	125.26	121.80	104.48	102.22	103.35	1.00E-09	2000	
M72	334981	4902831	GW Monitor	128.39	122.50	112.37	110.20	111.29	3.00E-05	2000	
M72-P01	334981	4902831	Packer Test	128.39	122.50	121.46	119.21	120.34	2.00E-09	2000	
M72-P02	334981	4902831	Packer Test	128.39	122.50	119.21	116.87	118.04	< 3.00E-11	2000	low K limit
M72-P03	334981	4902831	Packer Test	128.39	122.50	116.87	114.62	115.75	5.00E-11	2000	
M72-P04	334981	4902831	Packer Test	128.39	122.50	114.53	112.20	113.36	1.00E-10	2000	
M72-P05	334981	4902831	Packer Test	128.39	122.50	112.20	109.94	111.07	1.00E-05	2000	
M72-P06	334981	4902831	Packer Test	128.39	122.50	109.94	107.69	108.82	4.00E-07	2000	
M72-P07	334981	4902831	Packer Test	128.39	122.50	107.69	105.35	106.52	< 3.00E-11	2000	low K limit
M72-P08	334981	4902831	Packer Test	128.39	122.50	105.35	103.10	104.23	2.00E-06	2000	
M73	334931	4902891	GW Monitor	126.74	122.41	110.89	108.29	109.59	1.00E-05	2000	
M73-P01	334931	4902891	Packer Test	126.74	122.41	121.98	119.73	120.85	3.00E-09	2000	
M73-P02	334931	4902891	Packer Test	126.74	122.41	119.73	117.39	118.56	8.00E-08	2000	
M73-P03	334931	4902891	Packer Test	126.74	122.41	117.39	115.14	116.26	1.00E-06	2000	
M73-P04	334931	4902891	Packer Test	126.74	122.41	115.14	112.80	113.97	1.00E-07	2000	
M73-P05	334931	4902891	Packer Test	126.74	122.41	112.80	110.55	111.67	9.00E-06	2000	
M73-P06	334931	4902891	Packer Test	126.74	122.41	110.55	108.29	109.42	8.00E-06	2000	
M73-P07	334931	4902891	Packer Test	126.74	122.41	108.29	105.96	107.12	4.00E-06	2000	
M73-P08	334931	4902891	Packer Test	126.74	122.41	105.96	105.96	107.12	4.00E-06	2000 (dupl.)	
M73-P09	334931	4902891	Packer Test	126.74	122.41	105.96	103.70	104.83	8.00E-06	2000	
M73-P09	334931	4902891	Packer Test	126.74	122.41	103.70	101.37	102.54	9.00E-06	2000 (dupl.)	
M74	334950	4902962	GW Monitor	125.04	121.92	117.68	115.51	116.60	2.00E-07	2000	
M74-P01	334950	4902962	Packer Test	125.04	121.92	121.49	119.15	120.32	5.00E-09	2000	
M74-P02	334950	4902962	Packer Test	125.04	121.92	120.36	118.03	119.19	6.00E-07	2000	
M74-P03	334950	4902962	Packer Test	125.04	121.92	118.03	115.77	116.90	7.00E-07	2000	
M74-P04	334950	4902962	Packer Test	125.04	121.92	115.77	113.44	114.60	3.00E-09	2000	
M74-P05	334950	4902962	Packer Test	125.04	121.92	113.44	111.18	112.31	< 6.00E-11	2000	low K limit
M74-P06	334950	4902962	Packer Test	125.04	121.92	111.18	108.93	110.06	< 6.00E-11	2000	low K limit
M74-P07	334950	4902962	Packer Test	125.04	121.92	108.93	106.59	107.76	< 6.00E-11	2000	low K limit
M74-P08	334950	4902962	Packer Test	125.04	121.92	106.59	104.34	105.47	3.00E-09	2000	
M74-P09	334950	4902962	Packer Test	125.04	121.92	104.34	102.09	103.22	< 6.00E-11	2000	low K limit
M74-P10	334950										

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M92-P01	334767	4903780	Packer Test	128.16	127.78	101.50	98.98	100.24	3.00E-08	2006	
M92-P02	334767	4903780	Packer Test	128.16	127.78	104.03	101.50	102.77	< 1.00E-11	2006	low K limit
M92-P03	334767	4903780	Packer Test	128.16	127.78	106.56	104.03	105.30	< 1.00E-11	2006	low K limit
M92-P04	334767	4903780	Packer Test	128.16	127.78	109.09	106.56	107.83	< 1.00E-11	2006	low K limit
M92-P05	334767	4903780	Packer Test	128.16	127.78	111.54	109.09	110.32	< 1.00E-11	2006	low K limit
M92-P06	334767	4903780	Packer Test	128.16	127.78	114.15	111.54	112.84	< 1.00E-11	2006	low K limit
M92-P07	334767	4903780	Packer Test	128.16	127.78	116.68	114.15	115.41	< 1.00E-11	2006	low K limit
M92-P08	334767	4903780	Packer Test	128.16	127.78	119.21	116.68	117.94	< 1.00E-11	2006	low K limit
M92-P09	334767	4903780	Packer Test	128.16	127.78	121.73	119.21	120.47	< 1.00E-11	2006	low K limit
M92-P10	334767	4903780	Packer Test	128.16	127.78	124.26	121.73	123.00	< 1.00E-11	2006	low K limit
M92-P11	334767	4903780	Packer Test	128.16	127.78	125.74	123.22	124.48	< 1.00E-11	2006	low K limit
M93	335006	4903908	GW Monitor	125.54	124.62	118.41	115.77	117.09	3.87E-09	2006	
M93-P01	335006	4903908	Packer Test	125.54	124.62	97.76	95.23	96.49	< 1.00E-11	2006	low K limit
M93-P02	335006	4903908	Packer Test	125.54	124.62	100.29	97.76	99.02	< 1.00E-11	2006	low K limit
M93-P03	335006	4903908	Packer Test	125.54	124.62	102.82	100.29	101.55	< 1.00E-11	2006	low K limit
M93-P04	335006	4903908	Packer Test	125.54	124.62	105.34	102.82	104.08	< 1.00E-11	2006	low K limit
M93-P05	335006	4903908	Packer Test	125.54	124.62	107.87	105.34	106.61	< 1.00E-11	2006	low K limit
M93-P06	335006	4903908	Packer Test	125.54	124.62	110.40	107.87	109.14	3.00E-08	2006 (dupl.)	
M93-P06	335006	4903908	Packer Test	125.54	124.62	110.40	107.87	109.14	2.00E-08	2006 (dupl.)	
M93-P07	335006	4903908	Packer Test	125.54	124.62	112.93	110.40	111.67	5.00E-09	2006	
M93-P08	335006	4903908	Packer Test	125.54	124.62	115.46	112.93	114.20	1.00E-09	2006	
M93-P09	335006	4903908	Packer Test	125.54	124.62	117.99	115.46	116.72	3.00E-07	2006	
M93-P10	335006	4903908	Packer Test	125.54	124.62	120.52	117.99	119.25	3.00E-08	2006	
M93-P11	335006	4903908	Packer Test	125.54	124.62	122.16	119.63	120.90	7.00E-09	2006	
M94-1	335497	4903519	GW Monitor	124.21	122.30	107.58	104.94	106.26	9.93E-10	2006	
M94-P01	335497	4903519	Packer Test	124.21	122.30	97.36	94.83	96.10	< 1.00E-11	2006	low K limit
M94-P02	335497	4903519	Packer Test	124.21	122.30	99.89	97.36	98.63	< 1.00E-11	2006	low K limit
M94-P03	335497	4903519	Packer Test	124.21	122.30	102.42	99.89	101.16	< 1.00E-11	2006	low K limit
M94-P04	335497	4903519	Packer Test	124.21	122.30	104.95	102.42	103.69	< 1.00E-11	2006	low K limit
M94-P05	335497	4903519	Packer Test	124.21	122.30	107.48	104.95	106.21	8.00E-07	2006	
M94-P06	335497	4903519	Packer Test	124.21	122.30	110.01	107.48	108.74	2.00E-08	2006	
M94-P07	335497	4903519	Packer Test	124.21	122.30	112.54	110.01	111.27	6.00E-10	2006	
M94-P08	335497	4903519	Packer Test	124.21	122.30	115.06	112.54	113.80	< 1.00E-11	2006	low K limit
M94-P09	335497	4903519	Packer Test	124.21	122.30	117.59	115.06	116.33	2.00E-06	2006	
M94-P10	335497	4903519	Packer Test	124.21	122.30	120.12	117.59	118.86	2.00E-09	2006	
M94-P11	335497	4903519	Packer Test	124.21	122.30	122.03	119.50	120.76	1.00E-05	2006	
M94-2	335486	4903526	GW Monitor	124.31	122.18	120.95	117.90	119.42	6.51E-07	2006	
M95-1	334743	4902908	GW Monitor	123.42	122.11	108.91	106.26	107.59	1.07E-05	2006	
M95-P01	334743	4902908	Packer Test	123.42	122.11	96.07	93.54	94.81	< 1.00E-11	2006	low K limit
M95-P02	334743	4902908	Packer Test	123.42	122.11	98.57	96.05	97.31	5.00E-08	2006	
M95-P03	334743	4902908	Packer Test	123.42	122.11	101.16	98.57	99.86	6.00E-08	2006	
M95-P04	334743	4902908	Packer Test	123.42	122.11	103.68	101.16	102.42	3.00E-07	2006	
M95-P05	334743	4902908	Packer Test	123.42	122.11	106.19	103.68	104.93	2.00E-06	2006	
M95-P06	334743	4902908	Packer Test	123.42	122.11	108.70	106.19	107.44	2.00E-05	2006	
M95-P07	334743	4902908	Packer Test	123.42	122.11	111.21	108.70	109.95	5.00E-06	2006	
M95-P08	334743	4902908	Packer Test	123.42	122.11	113.81	111.21	112.51	4.00E-07	2006	
M95-P09	334743	4902908	Packer Test	123.42	122.11	116.30	113.81	115.05	3.00E-07	2006	
M95-P10	334743	4902908	Packer Test	123.42	122.11	118.83	116.30	117.57	2.00E-08	2006	
M95-P11	334743	4902908	Packer Test	123.42	122.11	120.56	118.05	119.31	6.00E-09	2006	
M95-2	334740	4902917	GW Monitor	123.37	122.00	120.78	117.74	119.26	6.51E-07	2006	
M96	335774	4903158	GW Monitor	129.609	125.40	126.87	122.29	124.58	1.50E-06	2008	Slug test
M97	335059	4902551	GW Monitor	126.653	118.42	119.95	115.38	117.66	2.60E-08	2008	Slug test
M98	334976	4902730	GW Monitor	130.225	120.78	122.30	117.73	120.01	2.80E-06	2008	Slug test
M99-1	334869	4902646	GW Monitor	130.491	120.74	114.34	111.29	112.81	< 1.00E-09	2008	Dry (not tested)
M99-2	334869	4902646	GW Monitor	130.511	120.76	122.21	117.63	119.92	1.30E-06	2008	Slug test
M100	334994	4902965	GW Monitor	125.781	122.09	123.62	119.05	121.34	2.60E-08	2008	Slug test
M101	334949	4903015	GW Monitor	124.351	122.03	122.37	119.02	120.69	3.90E-07		