

APPENDIX E

Survey Reports

Western



Australia

LICENSED SURVEYORS ACT, 1909-1958

Certificate of Registration

The Land Surveyors Licensing Board constituted
under the Licensed Surveyors Act,
1909-1958.

This is to Certify that

Colin John Smith

having satisfactorily proved his qualifications,
has been registered as a

Licensed Surveyor

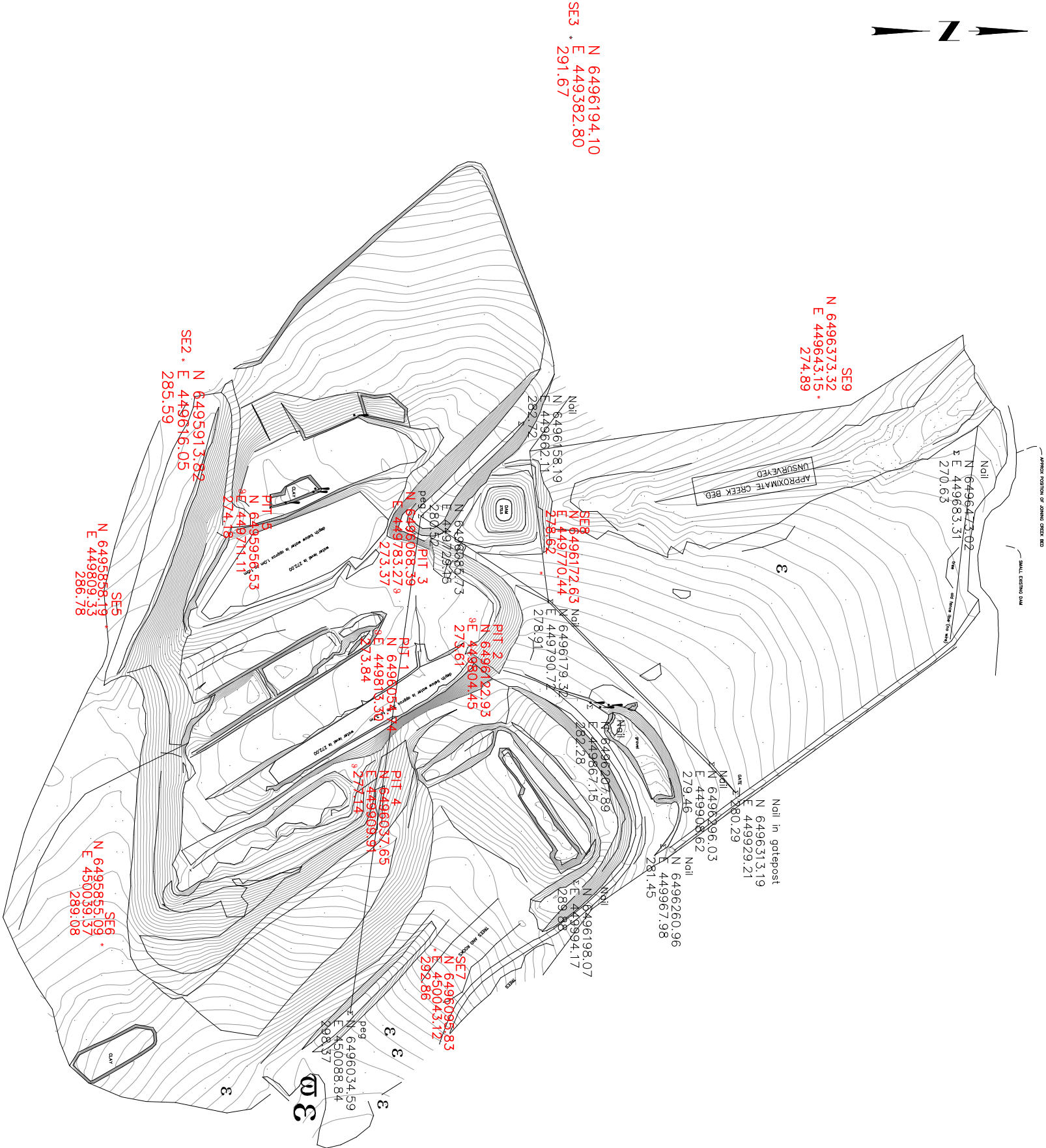
under the provisions of the Licensed Surveyors Act,
1909-1958.

Dated the *Tenth* day of *October* 1973

John Morgan Chairman

S. Stokes Secretary

W. J. Henderson
W. J. Henderson
Harold Green } Members
of the
Board



Point listing				
Name	Northing	Easting	Elevation	Feature Code
BDYLINE	6495125.655	449129.576	239.027	31100
CHE3	6493023.160	442693.206	392.405	21600
CHE3A	6493023.162	442693.204	392.407	21600
CHED3-RM1	6493023.165	442697.427	392.195	SPIKE
CHED3-RM2	6493023.165	442697.427	392.195	SPIKE
CHED3-RM3	6493023.055	442694.861	392.300	SPIKE
CHED3-RM4	6493020.563	442692.605	392.295	SPIKE
CHED4-RM2	6494323.025	442704.460	351.055	SPIKE
CHED4-RM3	6494323.512	442699.512	351.211	SPIKE
CHED5-RM1	6494329.090	441861.422	368.382	SPIKE
CHED5-RM2	6494325.575	441864.652	368.351	SPIKE
CHED5-RM3	6494325.725	441859.642	368.382	SPIKE
CHED5-RM4	6494329.075	441856.955	368.499	SPIKE
CHEDARING3	6493023.164	442693.196	392.405	SSM
CHEDARING4	6494325.512	442704.038	351.253	SSM
CHEDARING5	6494328.382	441859.746	368.702	SSM
LOTICNR	6495874.648	450563.388	302.755	22100
PTH258	6501265.383	443544.416	218.200	SSM
PTH259	6502939.125	449201.633	258.660	SSM
PTH323	6489857.650	448065.521	327.677	SSM
PTH323-RM1	6489860.842	448065.491	327.604	SPIKE
PTH323-RM2	6489859.203	448069.316	327.640	SPIKE
PTH323-RM3	6489855.165	448062.472	327.518	SPIKE
SE1	6495635.667	449807.222	274.404	37600
SE2	6495913.669	449616.098	285.584	37600
SE3	6496193.886	449382.966	291.613	37600
SE4	6495785.759	450377.899	299.858	37600
SIP	6495761.495	450336.553	296.610	21500
SIP1	6495761.495	450336.555	296.624	21500

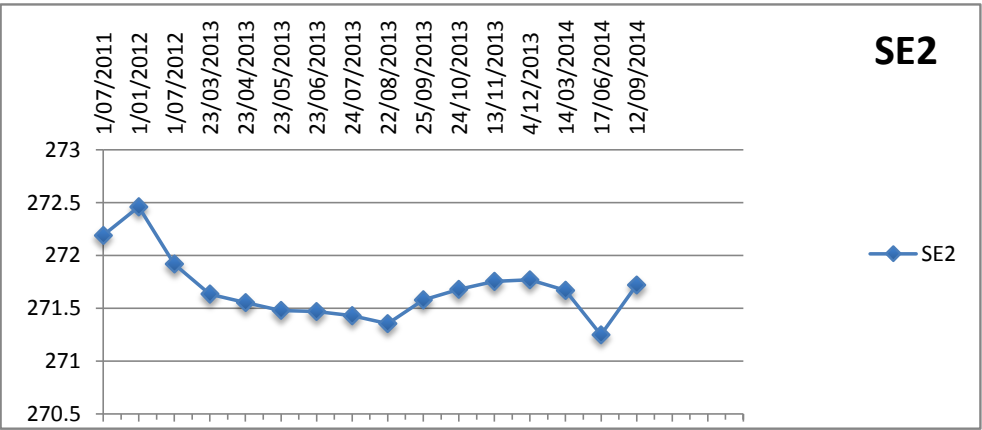
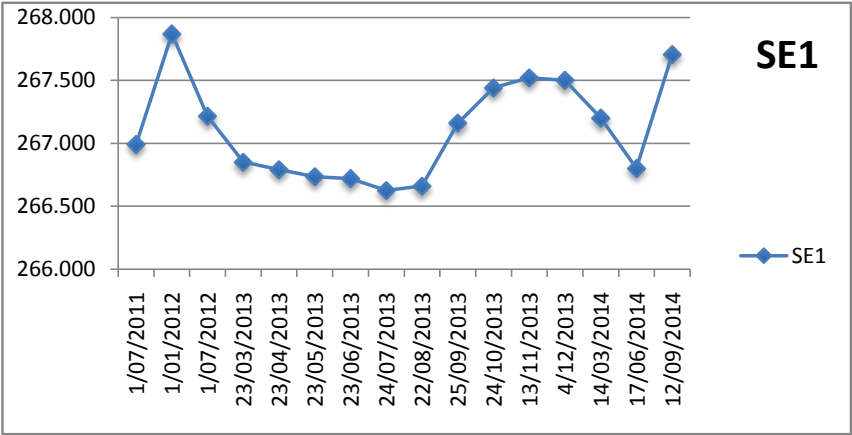
SHIRE OF TOODYAY			
PROJECT	LOT 11 CHITTY ROAD, TOODYAY	CLIENT	OPAL VALE
TITLE	UPDATED TOPOGRAPHIC SITE SURVEY	SUPERINTENDENT	IW Projects
Height Datum: AHD		SCALE	C.S.S. 1:500 (see note above)
Australian Pacific Survey Consultants 27 Vialat Grove, Shenton Park 6008 Phone 0418005021		DATE	16/7/2013
		REV	REV 2

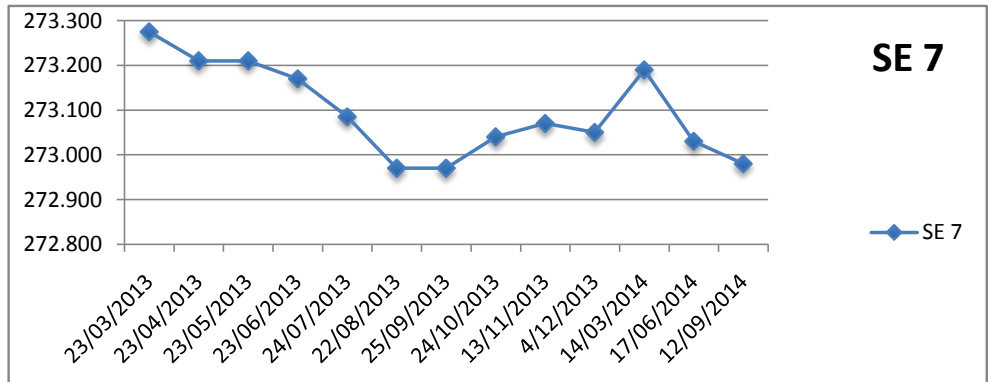
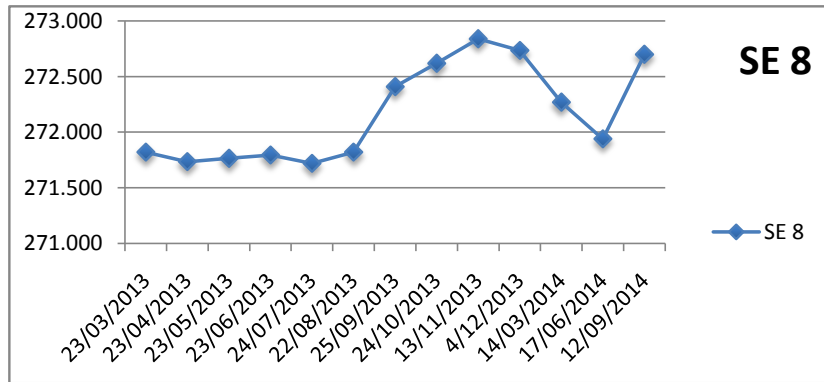
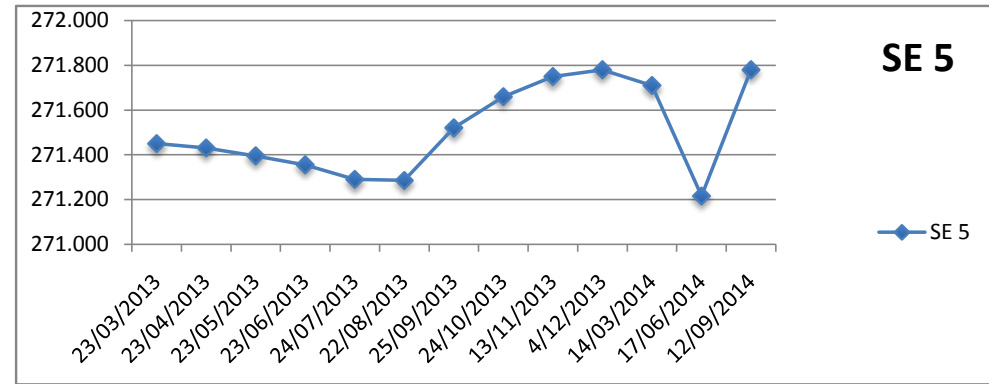
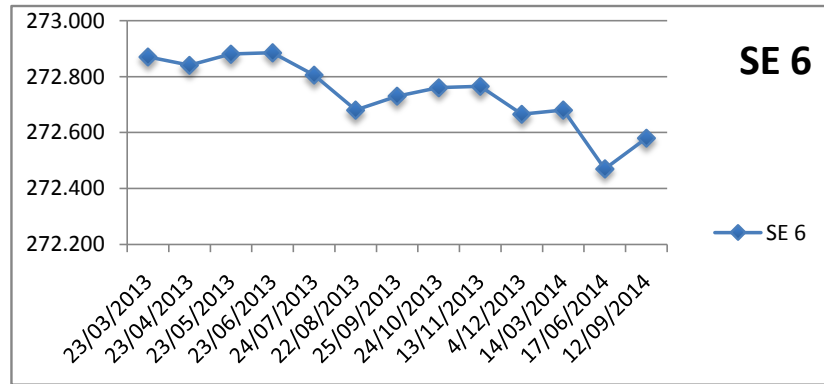
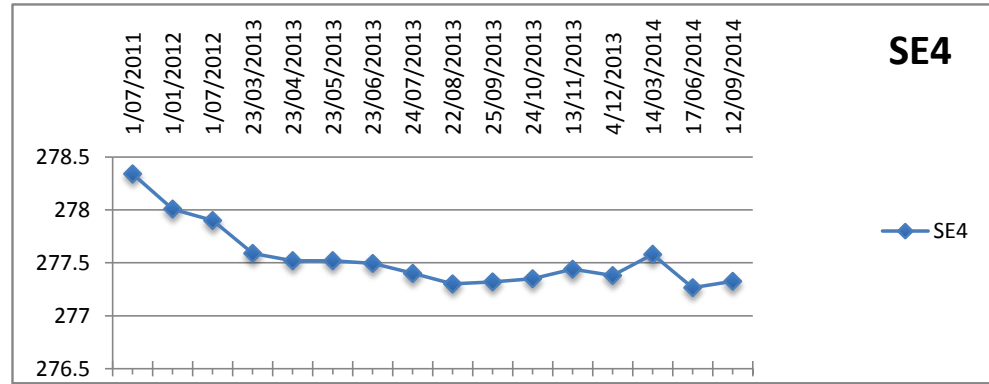
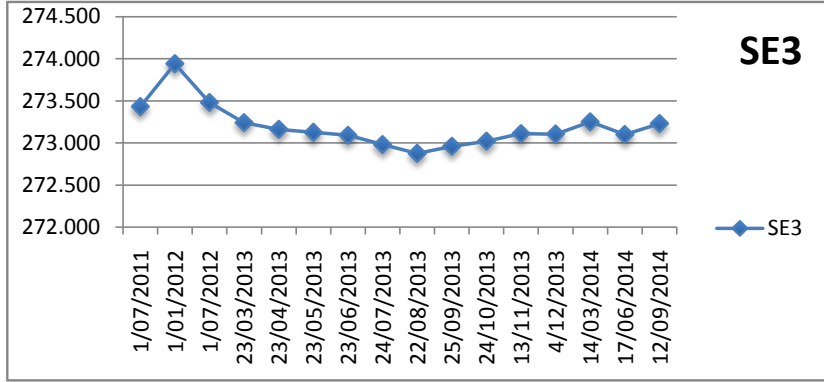
APPENDIX F

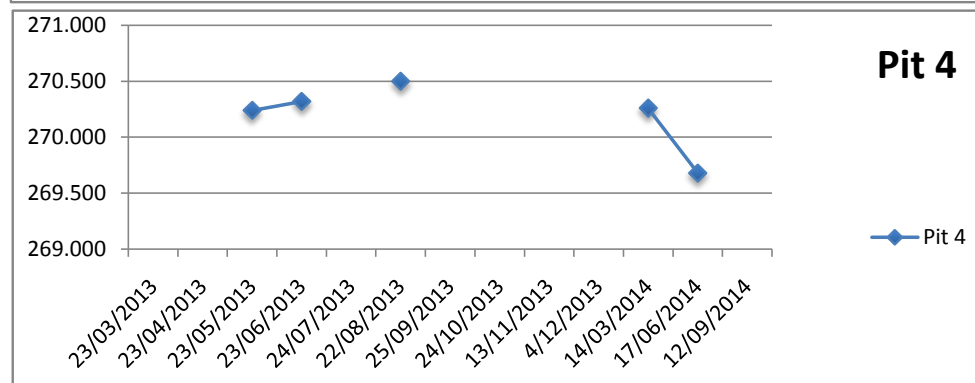
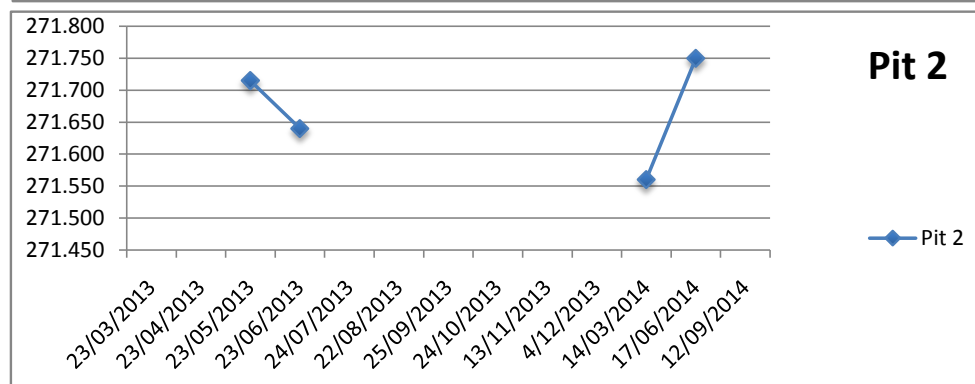
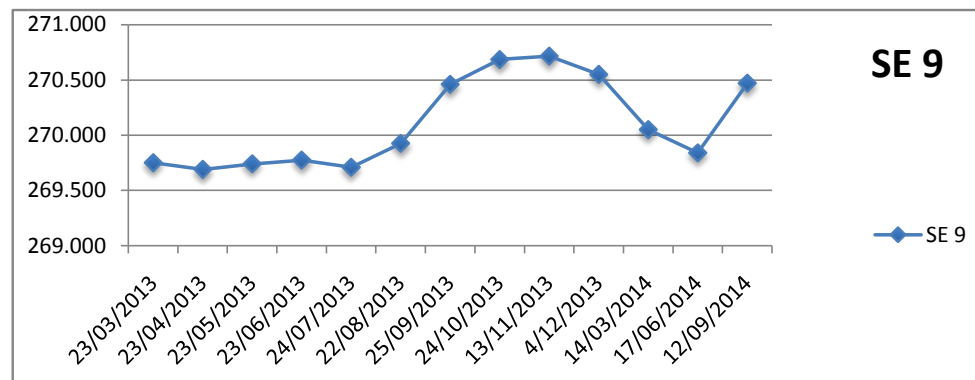
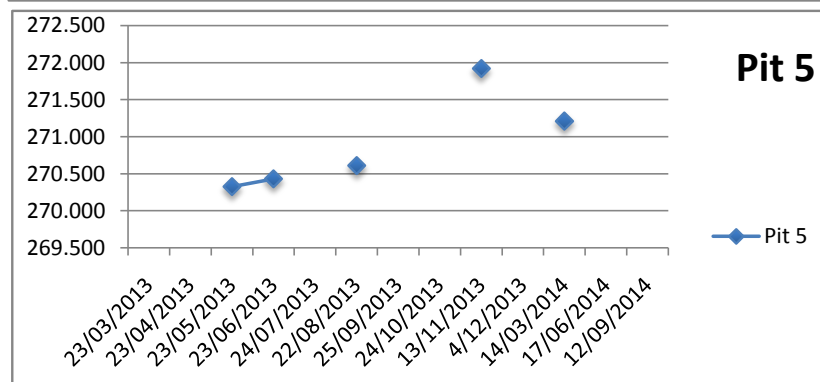
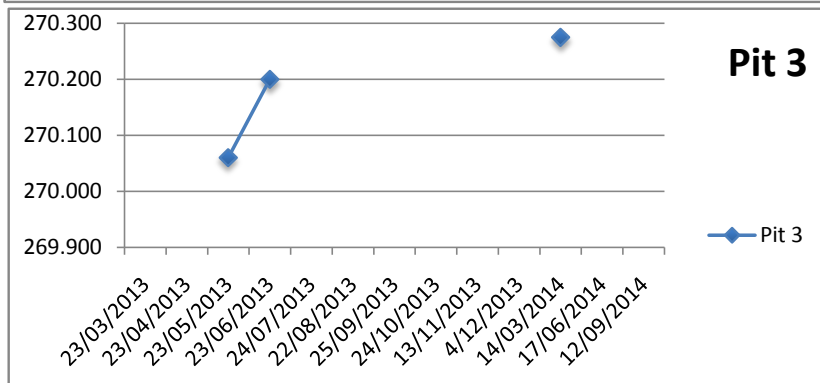
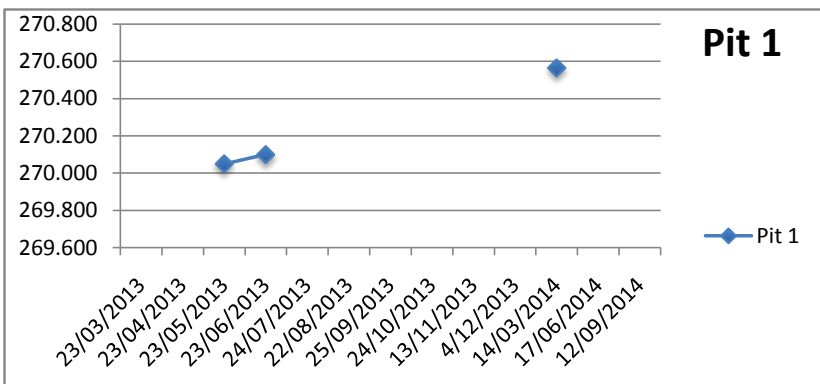
Water Level Database

Opal Vale Class II Landfill - Groundwater Levels (m AHD)

Bore ID	SE1	SE2	SE3	SE4	SE 5	SE 6	SE 7	SE 8	SE 9	Pit 1	Pit 2	Pit 3	Pit 4	Pit 5
Northings	6495635.667	6495913.67	6496193.886	6495785.76	6495858.19	6495855.090	6496095.83	6496172.63	6496373.32	6496055	6496123	6496068	6496038	6495948
Eastings	449807.222	449616.098	449382.966	450377.899	449809.33	450039.370	450043.12	449770.44	449643.15	449813.3	449804.3	449783.5	449911.2	449707.9
1/07/2011	266.990	272.19	273.430	278.34										
1/01/2012	267.868	272.46	273.940	278.008										
1/07/2012	267.215	271.92	273.480	277.9										
23/03/2013	266.850	271.635	273.240	277.590	271.450	272.870	273.275	271.820	269.750					
23/04/2013	266.790	271.555	273.160	277.520	271.430	272.840	273.210	271.735	269.690					
23/05/2013	266.735	271.480	273.125	277.520	271.395	272.880	273.210	271.765	269.740	270.050	271.715	270.060	270.240	270.325
23/06/2013	266.720	271.470	273.090	277.495	271.355	272.885	273.170	271.795	269.775	270.100	271.640	270.200	270.320	270.430
24/07/2013	266.625	271.430	272.980	277.400	271.290	272.805	273.085	271.72	269.71					
22/08/2013	266.660	271.355	272.875	277.300	271.285	272.680	272.970	271.82	269.925				270.5	270.61
25/09/2013	267.160	271.580	272.960	277.320	271.520	272.730	272.970	272.410	270.460					
24/10/2013	267.440	271.680	273.020	277.350	271.660	272.760	273.040	272.620	270.685					
13/11/2013	267.520	271.755	273.110	277.440	271.750	272.765	273.070	272.840	270.715					271.920
4/12/2013	267.500	271.770	273.105	277.380	271.780	272.665	273.050	272.735	270.550					
14/03/2014	267.200	271.670	273.250	277.580	271.710	272.680	273.190	272.270	270.050	270.565	271.560	270.275	270.260	271.210
17/06/2014	266.800	271.250	273.100	277.265	271.215	272.470	273.030	271.940	269.840		271.750		269.680	
12/09/2014	267.705	271.720	273.230	277.325	271.780	272.580	272.980	272.700	270.470					





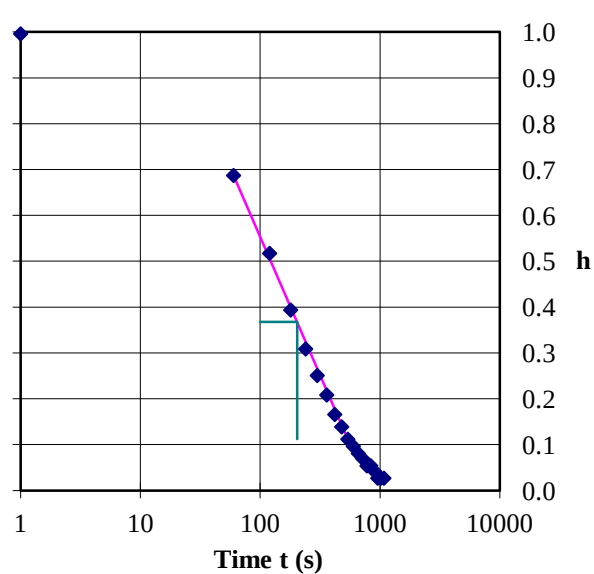


APPENDIX K

Permeability Testing - Data

OPAL VALE BORE SE 1 PERMEABILITY RISING HEAD SLUG TEST - July 2015

Calculation of Hydraulic Conductivity, K :



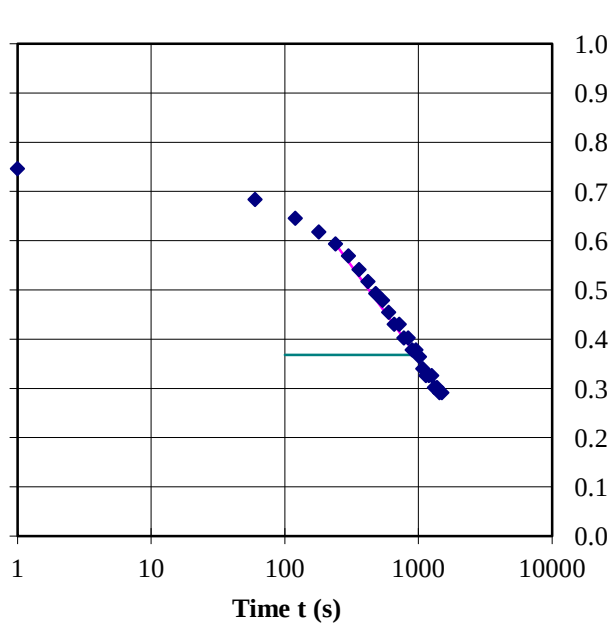
$$K_r = \frac{r_c^2}{2LT_0} \left[\frac{1.1}{\ln\left(\frac{d+L}{r_w^*}\right)} + \frac{A+B\left(\ln\left(\frac{b-(d+L)}{r_w^*}\right)\right)}{\frac{L}{r_w^*}} \right]^{-1}$$

DATA

i	Time t (s)	Level h (m)	Head H (m)
1	1	7.283	1.00
2	60	7.203	0.69
3	120	7.159	0.52
4	180	7.127	0.39
5	240	7.105	0.31
6	300	7.090	0.25
7	360	7.079	0.21
8	420	7.068	0.17
9	480	7.061	0.14
10	540	7.054	0.11
11	600	7.050	0.10
12	660	7.046	0.08
13	720	7.043	0.07
14	780	7.039	0.05
15	840	7.039	0.05
16	900	7.036	0.04
17	960	7.032	0.03
18	1020	7.032	0.03
19	1080	7.032	0.03

OPAL VALE BORE SE 2 PERMEABILITY RISING HEAD SLUG TEST - July 2015

Calculation of Hydraulic Conductivity, K :



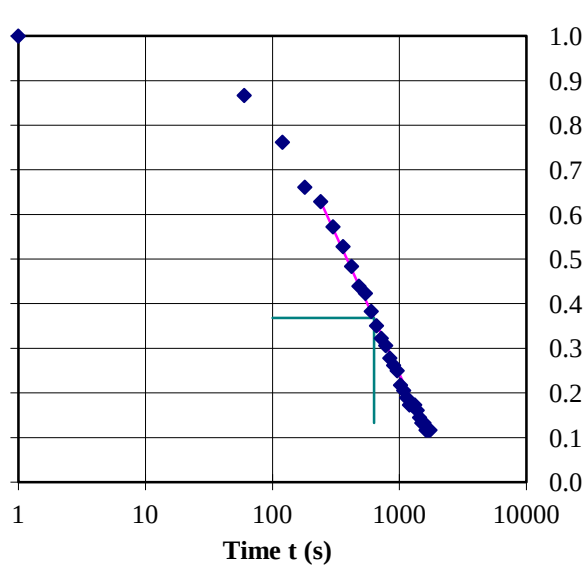
$$K_r = \frac{r_c^2}{2LT_0} \left[\frac{1.1}{\ln\left(\frac{d+L}{r_w^*}\right)} + \frac{A+B\left(\ln\left(\frac{b-(d+L)}{r_w^*}\right)\right)}{\frac{L}{r_w^*}} \right]^{-1}$$

DATA

i	Time t (s)	Water Level h (m)	Normalised Head H (m)
1	1	14.225	0.75
2	60	14.207	0.68
3	120	14.196	0.65
4	180	14.188	0.62
5	240	14.181	0.59
6	300	14.174	0.57
7	360	14.166	0.54
8	420	14.159	0.52
9	480	14.152	0.49
10	540	14.148	0.48
11	600	14.141	0.45
12	660	14.134	0.43
13	720	14.134	0.43
14	780	14.126	0.40
15	840	14.126	0.40
16	900	14.119	0.38
17	960	14.119	0.38
18	1020	14.115	0.36
19	1080	14.108	0.34
20	1140	14.104	0.33
21	1200	14.104	0.33
22	1260	14.104	0.33
23	1320	14.097	0.30
24	1380	14.097	0.30
25	1440	14.094	0.29
26	1500	14.094	0.29

OPAL VALE BORE SE 3 PERMEABILITY RISING HEAD SLUG TEST - July 2015

Calculation of Hydraulic Conductivity, K :



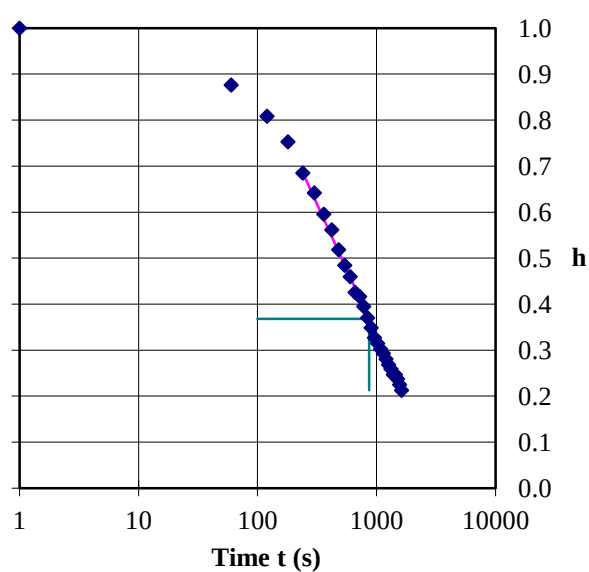
$$K_r = \frac{r_c^2}{2LT_0} \left[\frac{1.1}{\ln\left(\frac{d+L}{r_w^*}\right)} + \frac{A+B\left(\ln\left(\frac{b-(d+L)}{r_w^*}\right)\right)}{\frac{L}{r_w^*}} \right]^{-1}$$

DATA

i	Time t (s)	Level h (m)	Head H (m)
1	1	18.648	1.00
2	60	18.615	0.87
3	120	18.589	0.76
4	180	18.564	0.66
5	240	18.556	0.63
6	300	18.542	0.57
7	360	18.531	0.53
8	420	18.520	0.48
9	480	18.509	0.44
10	540	18.505	0.42
11	600	18.495	0.38
12	660	18.487	0.35
13	720	18.480	0.32
14	780	18.476	0.31
15	840	18.469	0.28
16	900	18.465	0.26
17	960	18.462	0.25
18	1020	18.454	0.22
19	1080	18.451	0.21
20	1140	18.447	0.19
21	1200	18.443	0.17
22	1260	18.443	0.17
23	1320	18.443	0.17
24	1380	18.440	0.16
25	1440	18.436	0.15
26	1500	18.433	0.13
27	1560	18.433	0.13
28	1620	18.429	0.12
29	1680	18.429	0.12
30	1740	18.429	0.12

OPAL VALE BORE SE 5 PERMEABILITY RISING HEAD SLUG TEST - July 2015

Calculation of Hydraulic Conductivity, K :

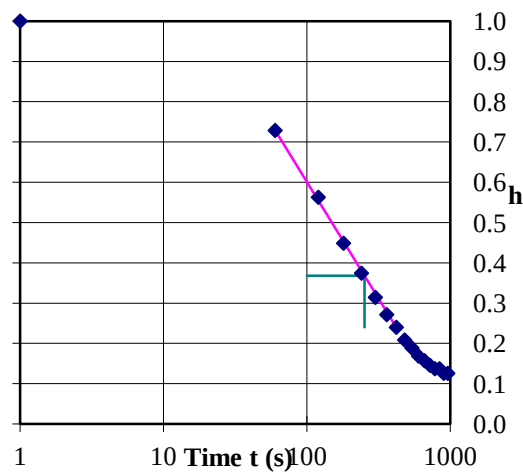


$$K_r = \frac{r_c^2}{2LT_0} \left[\frac{1.1}{\ln\left(\frac{d+L}{r_w^*}\right)} + \frac{A+B\left(\ln\left(\frac{b-(d+L)}{r_w^*}\right)\right)}{\frac{L}{r_w^*}} \right]^{-1}$$

DATA

i	Time t (s)	Level h (m)	Head H (m)
1	1	15.674	1.00
2	60	15.634	0.88
3	120	15.612	0.81
4	180	15.594	0.75
5	240	15.572	0.69
6	300	15.558	0.64
7	360	15.543	0.60
8	420	15.532	0.56
9	480	15.518	0.52
10	540	15.507	0.48
11	600	15.499	0.46
12	660	15.488	0.43
13	720	15.485	0.42
14	780	15.478	0.40
15	840	15.470	0.37
16	900	15.463	0.35
17	960	15.456	0.33
18	1020	15.452	0.31
19	1080	15.448	0.30
20	1140	15.445	0.29
21	1200	15.441	0.28
22	1260	15.437	0.27
23	1320	15.434	0.26
24	1380	15.430	0.25
25	1440	15.430	0.25
26	1500	15.427	0.24
27	1560	15.423	0.23
28	1620	15.419	0.21

OPAL VALE BORE SE 6 PERMEABILITY RISING HEAD TEST - July 2015



DATA

i	Time t (s)	Level h (m)	Head H (m)
1	1	16.940	1.00
2	60	16.845	0.73
3	120	16.787	0.56
4	180	16.747	0.45
5	240	16.721	0.37
6	300	16.700	0.31
7	360	16.685	0.27
8	420	16.674	0.24
9	480	16.663	0.21
10	540	16.656	0.19
11	600	16.649	0.17
12	660	16.645	0.16
13	720	16.641	0.15
14	780	16.638	0.14
15	840	16.638	0.14
16	900	16.634	0.13
17	960	16.634	0.13

Calculation of Hydraulic Conductivity, K :

$$K_r = \frac{r_c^2 \left[\frac{1.1}{\ln\left(\frac{d+L}{r_w^*}\right)} + \frac{A+B \left(\ln\left(\frac{b-(d+L)}{r_w^*}\right) \right)}{\frac{L}{r_w^*}} \right]^{-1}}{2LT_0}$$