



WINSTONE
AGGREGATES

THREE KINGS QUARRY
RESOURCE CONSENT 12977
ANNUAL MONITORING REPORT

April 2006.

ANNUAL THREE KING QUARRY MONITORING REPORT

Introduction

The following report is made with regard to Section 9 of the Monitoring and Contingency Plan for Dewatering Three Kings Quarry dated September 2005.

This report contains a compilation of all monitoring data and documents any settlement alarm level events, reviews and remedial action undertaken for the period of 1 April 2005 to 31 March 2006.

Monitoring Summary

The monitoring of groundwater levels has been undertaken monthly for the year ending March 31 2006. Groundwater levels within the quarry have been held above RL34m. No new groundwater monitoring bores were installed.

The monitoring of precise level survey marks has continued with surveys undertaken in June 2005 and March 2006. In September 2005, cessation of settlement (as defined in the permit to dewater Three Kings Quarry) was shown to have occurred. This resulted in precise level surveys required to be undertaken at 12 month intervals.

Monitoring and Contingency Plan

The consent to dewater Three Kings Quarry has been reviewed by the Auckland Regional Council. This was a publicly notified process commenced in April 2003 and settled by an Environment Court consent order dated 15 July 2005.

The Monitoring and Contingency Plan for Dewatering Three Kings Quarry was revised in light of the court order and a new monitoring and contingency plan was submitted for approval to the Auckland Regional Council in September 2005 (Monitoring and Contingency Plan for Dewatering Three Kings Quarry dated September 2005).

The revised monitoring and contingency plan for dewatering Three Kings Quarry was approved by the Auckland Regional Council in a letter dated 14 November 2005.

Precise Level Survey Results

For the year ending March 31 2006 (including the March 2006 survey of all precise level survey marks received in April 2006), three differential settlement alarm values were recorded, one in the June 2005 survey and two in the March 2006 survey. All three differential settlement alarms were recorded in the Hillsborough Road area and all involved differential settlements between 1 in 5000 and 1 in 2000.

The June 2005 differential settlement alarm level was recorded between points AP110 and AP111 on Hillsborough Road. The adjusted differential between survey marks was calculated at

1 in 3363 after making allowances for settlement prior to the marks being installed. The measure difference in level change between these two points being 3.33mm. The adjusted difference in level change was 5.27mm. The spacing between the marks is 17.7metres.

The March 2006 differential settlement alarm values were recorded between points AP110 and AP111 on Hillsborough Road and between points OCP68 and AP114 on Budock Road. The adjusted differential between AP110 and AP111 was calculated at 1 in 4150 and the adjusted differential between OCP68 and AP114 was calculated at 1 in 4645. The measured difference in level change between AP110 and AP111 was 2.33mm; the adjusted difference in level change was 4.27mm. The measured difference in level change between OCP68 and AP114 was 5.67mm; the adjusted difference in level change was 4.95mm. The spacing between OCP68 and AP114 is 23.0metres.

The settlement alarm events were reported to the Quarry Manager and the Auckland Regional Council. No further action was required as the spacing between these marks is already less than 50 metres.

REVIEWS

Groundwater

A review of the groundwater monitoring data was undertaken by Pattle Delamore Partners Ltd for the year ending June 30 2005 (Report entitled 2004/2005 Groundwater Monitoring Report dated October 2005).

The report concluded that monitoring over the 12 month period of July 2004 to July 2005 showed that groundwater levels generally recorded a flat or slightly falling trend. The falling trend was ascribed to be in response to reducing rainfall during the period as pumping was reduced slightly over the previous 12 months.

An assessment of the calibration of the groundwater model in light of a further 12 months monitoring data showed no need for a recalibration of the groundwater model.

No other reviews of groundwater levels were undertaken in the year ending March 31 2006.

Surface Levels

The results of precise level surfaces are checked as the results are received. The results of each precise level survey are forwarded to the Auckland Regional Council within 10 working days of the completion of each precise level survey.

A review of precise level survey data was undertaken by Tonkin and Taylor in April 2005 (letter report entitled Three Kings Quarry Dewatering Settlement Review Data to April 2005 dated 16 June 2005). This report reviewed settlement data to the March 2005 survey and included the findings of the Pattle Delemore annual groundwater report dated January 2005.

The Tonkin and Taylor report concluded that while surface settlement monitoring indicates that surface settlement is typically on-going about the quarry it is at a much reduced rate.

The on-going settlement close to the quarry was concluded to be the result of secondary consolidation induced by changes in groundwater pressure associated with past quarry dewatering. At increased distances from the quarry, Tonkin and Taylor concluded that it is

possible that the ongoing surface settlement includes some delayed consolidation as a result primarily of consolidation of soil strata not currently monitored by piezometers. Tonkin and Taylor concluded that any groundwater drawdown effects at distance from the quarry are small and surface settlement data at the fringe of drawdown are within expected settlement tolerances.

A further review of the precise level survey information was undertaken in August 2005 to determine if cessation of settlement had occurred (letter report dated 29 August 2005). It was found that cessation of settlement (as defined by the consent to dewater Three Kings Quarry) had occurred and this was reported more fully to the Auckland Regional Council in September 2005. As such, and because more than two years has elapsed since dewatering has been undertaken, precise level surveys are now required to be undertaken at 12 month intervals.

No other reviews of surface levels were undertaken in the year ending March 31 2006.

REMEDIAL ACTION

No remedial action was required or undertaken for the period ending 31 March 2006.

THREE KINGS GROUNDWATER LEVEL RECORD SHEET

Date	BH 1B	BH 2B	BH 5B	BH 6A	BH 6B	BH 6C	BH 7	BH 10a	BH 10b	BH 11b	BH 12a	BH 12b	BH 13a	BH 13c	BH 16	BH 17	BH 18A	BH 18B	BH 19A	BH 19B
20-Apr-05	34.67	34.05	34.03	44.69	39.61	35.33	39.77	50.87	72.67	72.39	50.27	66.88	55.17	66.26	50.76	34.04	35.44	44.82	34.05	38.80
18-May-05	34.92	34.25	34.34	44.69	39.65	35.42	39.76	50.89	72.66	72.42	50.12	66.88	54.96	66.26	50.67	34.25	35.41	44.46	34.29	38.80
14-Jun-05	35.88	35.18	35.34	44.51	40.17	36.32	39.99	50.93	72.64	72.38	50.28	66.98	54.81	66.26	50.58	35.24	35.81	44.68	35.23	39.00
20-Jul-05	36.89	36.16	36.40	44.50	40.91	37.31	41.22	50.94	72.65	72.42	50.83	67.12	64.32	66.26	50.94	36.29	36.90	44.49	36.35	39.00
17-Aug-05	35.69	34.96	35.20	45.36	40.53	36.50	40.33	51.06	72.65	72.39	51.03	67.00	62.97	66.21	51.36	35.08	36.67	45.42	35.21	38.94
21-Sep-05	35.00	34.31	34.40	45.52	40.07	35.74	40.07	51.90	72.65	72.39	50.76	67.03	61.52	66.23	51.25	34.31	35.69	45.24	34.40	39.00
19-Oct-05	35.74	35.00	35.13	45.70	40.49	36.35	40.84	51.00	72.65	72.39	51.10	67.08	64.14	66.26	51.37	35.04	35.89	45.56	35.07	38.95
16-Nov-05	35.53	34.86	34.99	46.19	40.47	36.18	40.11	51.19	72.65	72.41	51.17	67.03	63.04	66.26	51.64	34.90	36.14	45.75	34.99	38.95
14-Dec-05	35.22	34.47	34.64	46.01	40.22	35.79	39.90	50.91	72.66	72.41	50.89	67.01	58.60	66.21	51.40	34.40	36.02	45.63	34.62	38.95
18-Jan-06	34.88	34.11	34.23	45.62	39.97	35.45	39.76	50.89	72.65	72.41	50.71	66.91	55.97	66.22	51.18	34.11	35.78	45.46	34.26	38.93
15-Feb-06	34.67	34.03	34.06	45.41	39.81	35.29	39.75	50.89	72.65	72.40	50.60	66.97	55.72	66.22	51.07	34.03	35.62	45.07	34.05	38.93
15-Mar-06	34.79	34.14	34.11	45.13	39.76	35.29	39.62	51.90	72.65	72.40	50.44	66.97	55.46	66.22	50.92	34.01	35.62	45.07	34.11	38.95

Date	BH 20	BH 20A	BH 21	BH 22	BH 22a	BH 23	BH 23a	BH 24	BH 24a	BH 25	BH 25a	BH 25b1	BH 25b2	BH 26	BH 26a	BH 27	BH 28a	BH 28b	BH 29	BH 30
20-Apr-05	54.24	49.94	35.28	41.19	63.81	51.14	51.06	55.45	62.36	37.12	47.59	50.82	59.02	59.02	54.00	49.30	50.32	52.10	57.20	54.65
18-May-05	54.46	49.76	35.32	41.19	63.67	51.18	50.98	55.46	62.23	37.12	47.99	50.39	58.90	58.90	54.02	49.30	50.33	52.00	57.23	54.42
14-Jun-05	54.62	50.07	35.99	41.25	64.00	51.15	50.94	55.43	62.16	37.33	48.27	50.88	58.79	58.79	54.11	49.30	50.38	52.13	57.25	54.74
20-Jul-05	54.93	51.25	37.13	41.25	64.89	51.26	50.95	55.66	62.03	38.08	49.12	51.74	58.70	58.70	54.27	49.60	50.83	53.27	57.60	55.03
17-Aug-05	55.10	51.55	36.70	41.26	64.97	51.24	50.97	55.85	62.01	38.11	49.51	49.25	52.05	58.59	54.18	49.60	50.86	53.06	57.61	55.09
21-Sep-05	55.10	51.18	36.04	41.19	64.30	51.38	51.10	55.88	62.00	37.54	49.20	49.07	51.66	58.52	54.09	49.60	50.76	52.66	57.57	55.09
19-Oct-05	55.24	51.71	36.26	41.20	65.05	51.34	51.01	55.92	62.06	37.53	49.89	49.53	52.42	58.46	54.29	49.60	50.87	53.76	57.66	55.26
16-Nov-05	55.20	50.78	36.27	41.20	65.05	51.39	51.03	55.98	62.10	37.65	47.49	48.30	52.26	58.31	54.23	49.60	50.91	53.16	57.66	55.24
14-Dec-05	54.70	51.31	36.16	41.21	64.65	51.35	51.05	55.94	62.14	37.53	47.53	47.20	51.76	58.31	54.17	49.60	50.84	52.72	57.61	55.10
18-Jan-06	54.87	50.90	35.99	41.21	64.65	51.35	51.06	55.88	62.17	37.28	46.45	47.09	51.40	58.20	54.12	49.60	50.73	52.49	57.53	55.03
15-Feb-06	54.69	50.64	35.82	41.21	64.70	51.31	51.05	55.80	62.17	37.19	46.42	46.83	51.13	58.21	54.10	49.60	50.63	52.36	57.46	54.94
15-Mar-06	54.46	50.30	35.71	41.21	64.52	51.26	51.04	55.72	62.16	37.05	47.10	47.10	50.86	58.82	54.09	49.35	50.59	52.23	57.37	54.83

Date	BH 31a	BH 31b	BH 32	BH 33	BH 34	BH 35a	BH 35b	BH 36a	BH 36b	BH 37a	BH 37b	BH 38a	BH 38b	BH 39a	BH 39b	BH 40a	BH 40b
20-Apr-05	48.35	49.67	53.75	56.67	48.25	50.71	54.66	58.43	58.50	53.68	53.61	54.04	53.39	55.02	56.86	61.41	63.37
18-May-05	48.31	49.62	53.74	56.58	48.50	50.59	54.68	58.45	58.53	53.73	53.61	54.02	53.40	54.74	56.78	61.45	63.32
14-Jun-05	48.25	49.59	53.88	56.43	48.86	50.53	54.66	58.61	58.61	53.88	53.68	54.05	53.53	54.99	56.84	61.45	63.48
20-Jul-05	48.54	49.88	54.88	56.89	49.86	50.73	54.95	58.78	58.91	53.90	53.80	54.14	53.62	55.20	56.91	61.58	63.49
17-Aug-05	48.69	50.00	54.68	57.07	50.04	50.79	55.07	58.81	58.93	53.94	53.85	54.20	53.56	55.07	57.01	61.64	63.63
21-Sep-05	48.74	50.07	54.50	57.21	49.77	50.65	55.11	58.73	58.86	53.81	53.81	54.24	53.53	55.11	57.03	61.68	63.66
19-Oct-05	48.72	50.14	54.95	57.46	50.10	50.59	55.15	58.79	58.97	53.97	53.89	54.24	53.62	55.09	57.04	61.71	63.66
16-Nov-05	48.77	50.18	54.78	57.49	49.43	50.53	55.23	58.84	58.99	53.97	53.83	54.21	53.68	55.11	57.02	61.73	63.72
14-Dec-05	48.72	50.14	54.46	57.36	47.99	50.39	55.17	58.70	58.85	53.87	53.80	54.21	53.56	55.06	57.01	61.74	63.70
18-Jan-06	48.69	50.05	54.21	57.22	48.22	50.44	55.08	58.59	58.78	53.79	53.76	54.27	53.57	55.05	56.96	61.71	63.65
15-Feb-06	48.52	49.95	54.10	57.09	48.20	50.36	54.98	58.54	58.72	53.78	53.75	54.22	53.49	55.04	56.94	61.78	63.60
15-Mar-06	48.50	49.87	53.89	56.96	48.19	50.22	54.89	58.54	58.66	53.74	53.71	54.27	53.54	54.99	56.88	61.58	63.60

THREE KINGS SURVEY RECORD

Station ID	Location	Coordinates		Averaged Level	Absolute Levels (metres RL)			Change from Averaged Level (mm)		
		mN	mE		Mar-05	Jun-05	Mar-06	Mar-05	Jun-05	Mar-06
SS 3136	Mt Eden Rd	697910.7	299385.7	63.047	63.032		63.033	-15		-14
SS 3137	Mt Eden Rd	698072.6	299427.1	63.343	63.340		63.341	-3		-2
M 212A	Mt Albert Rd	696504.4	299153.2	86.127	86.112	86.115	86.114	-15		-13
SM 4163	Mt Albert Rd	696843.0	298513.0	74.142	74.142	74.143	74.143	0	1	1
SM 4164	Mt Albert Rd	696728.6	298688.4	75.851	75.847	75.847	75.846	-4	-4	-5
SM 4165	Mt Albert Rd	696625.1	298783.3	83.632	83.624	83.626	83.625	-8	-6	-7
SM 3882	Parau St	697063.3	298555.5	63.302	63.301		63.302	-1		0
RM 3898	McCullough Ave	697067.1	298760.3	76.078	76.064		76.066	-14		-12
RM 3899	McCullough Ave	696901.0	298813.2	77.811	77.801		77.803	-10		-8
RM 3900	McCullough Ave	696713.6	298916.5	76.657	76.643		76.644	-14		-13
RM 3901	Smallfield Ave	696669.6	298986.6	78.931	78.918		78.917	-13		-14
RM 3902	Smallfield Ave	696747.4	299014.2	80.177	80.164		80.165	-13		-12
RM 3903	Smallfield Ave	696834.7	298965.1	82.524	82.515		82.516	-9		-8
RM 3904	Smallfield Ave	696940.0	298912.5	82.708	82.699		82.699	-9		-9
RM 3907	Fyvie Ave	697063.3	299054.6	80.321	80.313		80.315	-8		-6
RM 3910	Scout Ave	696974.9	298672.9	83.414	83.405		83.405	-9		-9
RM 3925	Bremner Ave	696727.7	298541.5	65.423	65.425		65.426	2		3
RM 3926	Bremner Ave	696630.5	298449.0	59.088	59.093		59.093	5		5
RM 3933	Milliken Rd	696725.1	298412.7	71.049	71.053		71.055	4		6
RM 3934	Milliken Rd	696742.7	298472.3	66.303	66.307		66.308	4		5
RM 3935	Simmonds Ave	696877.0	298725.7	91.755	91.745		91.746	-10		-9
RM 3936	Simmonds Ave	696788.8	298756.8	90.869	90.858		90.858	-11		-11
RM 7440	Hayr Rd	696258.1	299279.7	84.033	84.026		84.026	-7		-7
RM 7457	Mt Albert Rd	696575.4	298967.9	85.707	85.692	85.695	85.694	-15	-12	-13
AP 1	Plaza, Mt Albert Rd	696589.8	299127.2	81.269	81.253		81.254	-16		-15
AP 2	Plaza, Mt Albert Rd	696706.4	299158.2	76.290	76.277		76.279	-13		-11
AP 2A	Plaza, Mt Albert Rd	696679.3	299152.5	77.582	77.571		77.573	-11		-9
AP 3	Plaza, Mt Albert Rd	696693.0	299259.1	77.367	77.355		77.357	-12		-10
AP 4	Plaza, Mt Albert Rd	696564.8	299244.9	83.366	83.348		83.349	-18		-17
AP 13	Barrister Ave	696796.0	299064.3	79.867	79.859		79.860	-8		-7
AP 20	Grahame Breed Dr	696723.1	299358.5	76.792	76.783		76.785	-9		-7
SM 3123	Mt Eden Rd	697750.1	299344.8	75.676	75.659		75.659	-17		-17
SM 3124	Landscape Rd	697715.8	299328.0	77.724	77.706		77.706	-18		-18
SM 3125	Landscape Rd	697810.2	298959.4	69.440	69.431		69.432	-9		-8
AP 3125A	Landscape Rd	697810.1	298967.6		69.541	Discontinued 03/06		-9		
SM 3126	Landscape Rd	697873.0	298716.4	63.015	63.011		63.013	-4		-2
SS 3127	Landscape Rd	697912.0	298565.7	59.724	59.724		59.725	0		1
SS 3132	Waitomo St	697987.8	298590.9	61.689	61.689		61.690	0		1
SM 3883	Parau St	697157.0	298581.0	64.371	64.368		64.368	-3		-3
RM 3884	Parau St	697302.0	298629.2	62.539	62.535		62.537	-4		-2
SM 3885	Duke St	697474.4	298680.3	61.857	61.849		61.851	-8		-6
RM 3886	Fearon Ave	697329.6	298529.5	55.236	55.235		55.237	-1		1
RM 3887	Fearon Ave	697221.3	298498.2	51.548	51.543		51.543	-5		-5
OCP 3888	Parau St	697732.6	298744.4	62.513	62.507		62.508	-6		-5
RM 3889	Duke St	697452.3	298785.5	69.233	69.213		69.215	-20		-18
RM 3891	Duke St	697515.9	299039.8	77.575	77.561		77.562	-14		-13
RM 3892	Duke St	697529.2	299086.3	78.012	77.998		77.999	-14		-13
RM 3893	Duke St	697610.7	299248.1	79.146	79.126		79.126	-20		-20
RM 3894	Fulljames Ave	697586.8	298923.4	72.082	72.065		72.065	-17		-17
RM 3895	Hamon Ave	697620.4	298829.5	65.188	65.183		65.179	-5		-9
RM 3896	McCullough Ave	697345.5	298887.0	69.820	69.800		69.802	-20		-18
RM 3897	McCullough Ave	697170.6	298776.6	75.084	75.069		75.071	-15		-13
RM 3905	Fyvie Ave	697080.6	298924.0	75.813	75.806		75.807	-7		-6
RM 3906	Fyvie Ave	697134.6	298836.1	77.447	77.435		77.437	-12		-10
RM 3908	Fyvie Ave	697093.6	299129.2	82.069	82.064		82.065	-5		-4
RM 3909	Scout Ave	697136.4	298680.6	80.056	80.046		80.048	-10		-8
RM 3911	Dally Tce	697387.5	298991.1	88.894	88.881		88.880	-13		-14
RM 3912	Fearon Ave	697399.3	298512.8	51.652	51.654		51.655	2		3
RM 3913	Fearon Ave	697445.8	298362.0	49.238	49.244		49.244	6		6
RM 3921	Duncumb St	697530.8	298402.7	50.034	50.039		50.038	5		4
RM 3923	Connelly Ave	697465.9	299086.3	74.293	74.279		74.280	-14		-13
RM 3924	Connelly Ave	697424.6	299131.9	73.034	73.021		73.023	-13		-11
SM 4354	Mt Eden Rd	697606.0	299322.2	80.155	80.134		80.133	-21		-22
SM 6241	Duke St	697468.6	298893.4	70.012	69.990		69.990	-22		-22
OCP 908	Duke St	697480.4	298934.3	71.805	71.788		71.789	-17		-16
AP 10	Roskill Way	697458.1	299308.7	82.673	82.661		82.661	-12		-12
AP 14	Churches Ave	697318.1	298969.2	91.334	91.323		91.322	-11		-12
AP 15	Dally Terrace	697357.2	299055.9	90.821	90.812		90.811	-9		-10
AP 17	DESTROYED	697296.8	299405.8							
AP 17A	DESTROYED	697293.5	299407.9							
AP 17C	Hunters Park Dr	697293.9	299402.9	74.602	74.598		74.597	-4		-5
AP 24	Big King Reserve	697237.9	299127.4		130.209	Discontinued 03/06		-9		
AP 29	DESTROYED	697501.6	298517.9							
AP 29A	Duke St	697501.6	298517.8	49.542	49.543		49.541	2		-1
M 220	Mt Eden Rd	697232.6	299557.2	81.700	81.689		81.687	-11		-33
M 221	Mt Eden Rd	697359.1	299539.9	83.449	83.436		83.436	-13		-13
SS 1555	Selwyn Rd	697413.6	300062.9	99.584	99.582		99.581	-2		-3
SS 1556	Selwyn Rd	697425.9	300012.8	102.373	102.371		102.369	-2		-4
SS 1617	St Andrews Rd	697887.7	299983.3	81.442	81.444		81.443	2		1
SS 1618	St Leonards Rd	697906.0	299884.5	78.478	78.475		78.475	-3		-3

Station ID	Location	Coordinates		Averaged Level	Absolute Levels (metres RL)			Change from Averaged Level (mm)		
		mN	mE		Mar-05	Jun-05	Mar-06	Mar-05	Jun-05	Mar-06
SS 1619	St Leonards Rd	697935.7	299724.6	66.617	66.614		66.614	-3		-3
SS 1623	St Andrews Rd	697461.1	299875.0	107.522	107.517		107.513	-5		-9
SS 3306	Mt Eden Rd	697993.2	299406.8	60.565	60.557		60.557	-8		-8
SS 3307	St Leonards Rd	697985.8	299454.7	59.661	59.654		59.655	-7		-6
SS 3308	St Leonards Rd	697952.2	299636.0	63.275	63.272		63.272	-3		-3
SS 3311	Rahiri Rd	697752.0	299610.9	95.306	95.296		95.297	-10		-9
SS 3312	Rahiri Rd	697733.6	299683.0	95.929	95.920		95.921	-9		-8
SS 3313	Landscape Rd	697648.3	299592.5	112.633	112.619		112.619	-14		-14
SS 3315	Rewa Rd	697613.4	299396.6	80.938	80.918		80.917	-20		-21
SS 3316	Rewa Rd	697579.5	299529.8	98.902	98.884		98.886	-18		-16
RM 6807	St Andrews Rd	697216.7	299808.1	102.487	102.475		102.472	-12		-15
RM 6812	St Andrews Rd	697370.6	299846.6	108.907	108.897		108.892	-10		-15
SM 6826	Buckley Rd	697157.9	300077.5	74.710	74.708		74.707	-2		-3
RM 6827	Buckley Rd	697346.0	300128.0	83.332	83.333		83.332	1		0
SM 6828	Buckley Rd	697383.8	300177.4	87.952	87.953		87.951	1		-1
RM 7701	DESTROYED	697619.2	299656.3							
AP 7701A	DESTROYED	697616.4	299654.0							
SS 7701B	Landscape Rd	697619.7	299657.1	115.510	115.510		115.510			0
RM 7702	DESTROYED	697601.7	299725.3							
AP 7702A	DESTROYED	697601.4	299716.5							
SS 7702B	Landscape Rd	697602.3	299725.8	110.540	110.540		110.539			-1
RM 7703	Landscape Rd	697589.2	299608.4	100.149	100.141		100.136	-8		-13
SM 7704	St Andrews Rd	697556.9	299894.5	97.816	97.812		97.808	-4		-8
RM 7705	St Andrews Rd	697703.3	299921.8	88.086	88.084		88.083	-2		-3
AP 9	St Andrews Rd	697103.9	299782.2	92.802	92.784		92.782	-18		-20
AP 11	Mt Eden Rd	697168.4	299548.7	80.191	80.183		80.184	-8		-7
AP 16	Queens Way	697156.2	299676.2	83.646	83.629		83.630	-17		-16
OIS 18	DESTROYED	697507.9	299386.4							
AP 18A	DESTROYED	697510.4	299381.6		81.489	Refer AP 18B		-13		
AP 18B	Mt Eden Rd	697509.3	299384.3	81.642			81.642			
M 205	Mt Albert Rd	696471.2	300138.5	59.305	59.305	59.304	59.304	0	-1	-1
AP 206	Mt Albert Rd	696526.7	299919.5	59.976	59.969	59.969	59.969	-7	-7	-7
M 210	Mt Albert Rd	696536.1	299441.6	83.050	83.032	83.034	83.034	-18	-16	-16
OIT 219D	Mt Eden Rd	696902.2	299520.3		76.319	Discontinued 03/06		-8		
M 219	DESTROYED	696898.1	299518.7							
IT 219C	Mt Eden Rd	696891.8	299519.1							
SM 1979	Hillsborough Rd	696308.0	299637.3	61.241	61.219	61.217	61.217	-22	-24	-24
BP 1977B	Hillsborough Rd	696141.8	299609.9	71.993	71.988	71.987	71.985	-5	-6	-8
SM 6809	St Andrews Rd	697001.3	299757.4	81.800	81.782		81.781	-18		-19
SM 6810	St Andrews Rd	696925.6	299720.9	76.956	76.940		76.939	-16		-17
RM 6811	St Andrews Rd	696849.0	299715.4	76.526	76.509		76.507	-17		-19
RM 6813	St Andrews Rd	696632.0	299653.0	80.905	80.883	80.885	80.883	-22	-20	-22
SM 6814	DESTROYED	696542.1	299630.7							
IT 210B	Mt Albert Rd	696537.3	299458.1							
RM 6816	Rowan Rd	696721.9	299845.7	78.908	78.889		78.889	-19		-19
SM 6817	Rowan Rd	696808.8	299876.8	80.995	80.981		80.980	-14		-15
RM 6818	Rowan Rd	696826.7	299791.3	81.966	81.949		81.948	-17		-18
RM 6819	Buckley Rd	696678.0	299942.3	65.620	65.611		65.610	-9		-10
SM 6820	Buckley Rd	696808.1	299988.8	71.955	71.949		71.948	-6		-7
SM 6821	Buckley Rd	696938.5	300004.3	71.114	71.110		71.108	-4		-6
SM 6822	Gorrie Ave	696973.9	299863.2	81.874	81.859		81.858	-15		-16
SM 6823	Buckley Rd	697012.4	300021.7	70.593	70.589		70.586	-4		-7
RM 6824	Buckley Rd	697044.4	300030.4	71.084	71.082		71.080	-2		-4
RM 6825	Quentin Ave	697092.9	299916.8	81.386	81.376		81.374	-10		-12
SM 6835	Torrance St	696970.0	300185.7	70.784	70.786		70.784	2		0
SM 6836	Torrance St	696930.3	300343.3	65.955	65.957		65.956	2		1
RM 6838	Fernleigh Ave	696773.3	300065.8	70.304	70.298		70.299	-6		-5
SM 6839	Fernleigh Ave	696748.1	300163.5	67.487	67.486		67.486	-1		-1
SM 6840	Fernleigh Ave	696714.7	300296.0	63.278	63.279		63.279	1		1
SM 6841	Peet Ave	696626.7	300131.6	65.698	65.696		65.696	-2		-2
SM 6843	Kings Way	696958.8	299640.6	75.161	75.149		75.149	-12		-12
RM 7647	Mt Albert Rd	696565.0	299755.1	67.601	67.580	67.580	67.579	-2	-21	-22
ORM.1	Weaver Street	696836.5	300316.2	63.578	63.580		63.579	21		1
AP 5	Mt Eden Rd	696757.0	299500.9	75.746	75.736		75.737	-10		-9
AP 6	Queens Way	696746.9	299590.6	75.306	75.290		75.289	-16		-17
AP 7	DESTROYED	696780.6	299702.3		76.813	Refer AP 7A		-18		
AP 7A	St Andrews Rd	696778.9	299702.1	76.821			76.821			
OIS 8	DESTROYED									
AP 8A	DESTROYED	696560.1	299646.5							
AP 8B	Mt Albert Rd	696559.1	299633.5	75.740	75.729	75.730	75.730	-11	-10	-10
AP 12	Warren Ave	696409.1	299402.2	94.357	94.341		94.343	-16		-14
OAP 19	St Andrews Rd	696725.0	299676.4	77.508	77.487		77.486	-21		-22
AP 21	DESTROYED	696997.1	299533.0		77.390	Refer AP 21A		-7		
AP 21A	Mt Eden Rd	696997.9	299534.3	77.288			77.288			
AP 22	Queens Way	697069.3	299667.6	78.352	78.339		78.340	-13		-12
AP 23	Queens Way	696858.6	299609.6	74.402	74.391		74.391	-11		-11
AP 30	Mt Eden Rd	696966.2	299525.1	77.329	77.320		77.321	-9		-8
AP 31	Mt Eden Rd	696934.2	299521.4	76.857	76.854		76.854	-3		-3
AP 32	Mt Eden Rd	696902.6	299517.8	76.203	76.194		76.195	-9		-8
AP 33	Mt Eden Rd	696855.1	299512.3	75.121	75.113		75.114	-8		-7
AP 34	Mt Eden Rd	696807.3	299506.8	74.937	74.925		74.926	-12		-11
SM 5387	Erson Ave	696146.2	300815.9	56.747	56.747		56.749	0		2

Station ID	Location	Coordinates		Averaged Level	Absolute Levels (metres RL)			Change from Averaged Level (mm)		
		mN	mE		Mar-05	Jun-05	Mar-06	Mar-05	Jun-05	Mar-06
SM 5386	Symonds St	696104.1	300983.3	55.184	55.184		55.186	0		2
M 638	Manukau Rd	696081.5	301109.3	54.690	54.690		54.691	0		1
CA 55	Manukau Rd	696605.9	300894.3	65.1412	65.1412	65.1412	65.1412	0	0	0
CA 53	Akarana Ave	696935.9	298292.1	70.5937	70.5937	70.5937	70.5937	0	0	0
M 216	Mt Albert Rd	696903.5	298347.9	72.658	72.658	72.658	72.658	0	0	0
SS 1977	Hillsborough Rd	696020.2	299595.8	74.453	74.452	74.451	74.450	-1	-2	-3
RM 3927	Bremner Ave	696633.3	298338.8	62.651	62.651		62.652	0		1
RM 3928	Bremner Ave	696727.8	298195.8	56.144	56.146		56.145	2		1
OCF 26B	DESTROYED	696795.5	298153.8							
AP 139	Bremner Ave	696788.0	298157.4	56.226	56.226		56.225			0
RM 3931	Milliken Ave	696817.5	298257.5	62.500	62.501		62.501	1		1
RM 3932	Milliken Ave	696734.0	298363.2	71.719	71.719		71.720	0		1
SS 3004	Dominion Rd	698058.8	298223.5	51.812	51.812		51.814	0		2
SS 3131	Shackleton Rd	698110.5	298631.8	59.419	59.418		59.420	-1		1
SS 3133	Shackleton Rd	698071.3	298770.7	59.554	59.553		59.553	-1		-1
SS 3134	Shackleton Rd	698021.7	298946.5	61.479	61.475		61.475	-4		-4
SS 3135	Shackleton Rd	697966.3	299165.8	61.684	61.681		61.683	-3		-1
SS 3151	Mt Eden Rd	698285.9	299497.7	67.987	67.987		67.988	0		1
SS 1905	St Andrews Rd	698147.7	300049.4	88.810	88.808		88.808	-2		-2
RM 7707	St Andrews Rd	697973.7	299991.0	81.206	81.204		81.204	-2		-2
SS 1558	Empire Rd	697813.8	300111.4	92.169	92.166		92.166	-3		-3
SS 1559	Empire Rd	697800.0	300165.5	96.024	96.024		96.021	-3		-3
SS 1549	The Drive	697753.3	300348.7	85.871	85.869		85.869	-2		-2
SS 1550	The Drive	697589.9	300306.7	84.432	84.431		84.431	-1		-1
RM 6830	The Drive	697538.2	300294.8	81.638	81.637		81.636	-1		-2
SS 1551	The Drive	697492.5	300281.7	77.481	77.479		77.478	-2		-3
RM 6829	Selwyn Rd	697363.1	300258.1	79.864	79.860		79.858	-4		-6
RM 6832	Selwyn Rd	697337.4	300403.6	80.190	80.187		80.187	-3		-3
SM 5912	Pah Rd	697278.1	300666.2	74.285	74.283		74.283	-2		-2
AP 35	Mt Albert Rd	696402.1	300407.2	54.190	54.192	54.192	54.192	2	2	2
AP 37	Hillsborough Rd	696407.4	299705.9	59.335	59.330	59.328	59.327	-5	-7	-8
AP 38	Budock Rd	696246.8	299834.7	69.274	69.273	69.271	69.272	-1	-2	-1
AP 39	Hillsborough Bowling	696383.1	299856.3	56.297	56.296	56.293	56.293	-1	-4	-4
AP 40	Hillsborough Bowling	696445.9	299895.6	55.757	55.756	55.754	55.753	-1	-3	-4
IS 41	Hillsborough Bowling	696403.8	299804.8	56.336	56.334	56.332	56.332	-2	-4	-4
AP 42	Dornwell Rd	696378.4	299015.9	76.373	76.366		76.366	-7		-7
AP 43	Dornwell Rd	696260.6	298956.8	66.002	65.997		65.996	-5		-6
AP 44	Dornwell Rd	696110.0	298858.9	58.493	58.490		58.487	-3		-6
AP 45	Frost Rd	696471.9	298726.9	64.920	64.913		64.914	-7		-6
AP 54	Frost Rd	696264.7	298577.8	57.855	57.849		57.847	-6		-8
AP 46	Dominion Rd	697995.6	298226.6	50.443	50.444		50.445	1		2
AP 47	Landscape Rd	697950.6	298343.5	52.522	52.523		52.525	1		3
AP 48	Landscape Rd	697921.3	298458.6	56.819	56.819		56.820	0		1
OIS 49	DESTROYED	697784.6	299059.5							
AP 49A	Landscape Rd	697784.6	299050.5	70.323	70.320		70.320	-3		-3
AP 50	DESTROYED	697765.1	299133.1		71.641	Refer AP 50A		-5		
AP 50A	Landscape Rd	697765.1	299133.2	71.654			71.654			
OIS 51	DESTROYED	697745.5	299212.0							
AP 51A	Landscape Rd	697744.9	299214.7	74.053	74.049		74.050	-4		-3
AP 55	Mt Eden Rd	698209.0	299461.8	68.263	68.263		68.263	0		0
AP 56	Mt Albert Rd	696314.4	300774.8	58.409	58.410	58.410	58.410	1	1	1
AP 60	Rowan Rd	696681.1	299826.3	76.276	76.269		76.268	-7		-8
AP 61	Rowan Rd	696616.5	299797.1	71.310	71.304	71.306	71.303	-6	-4	-7
AP 62	Mt Albert Rd	696530.2	299814.0	63.068	63.064	63.063	63.062	-4	-5	-6
AP 63	Mt Albert Rd	696521.1	299876.4	61.250	61.248	61.247	61.247	-2	-3	-3
AP 64	Hillsborough Rd	696478.5	299774.3	60.579	60.577	60.576	60.575	-2	-3	-4
AP 65	Hillsborough Rd	696446.6	299735.8	59.546	59.543	59.541	59.540	-3	-5	-6
OAP 66	Hillsborough Rd	696359.4	299672.8	59.987	59.986	59.984	59.984	-1	-3	-3
AP 67	Hillsborough Rd	696248.4	299622.2	63.871	63.869	63.868	63.868	-2	-3	-3
OCF 68	Budock Rd	696236.0	299684.4	66.304	66.305	66.303	66.302	1	-1	-2
AP 69	Budock Rd	696249.6	299731.2	65.977	65.977	65.975	65.976	0	-2	-1
AP 70	Budock Rd	696244.1	299790.4	71.208	71.209	71.206	71.207	1	-2	-1
OAP 71	Hillsborough Rd	696195.2	299615.8	67.651	67.651	67.649	67.649	0	-2	-2
AP 72	Hillsborough Rd	696072.4	299594.0	74.077	74.077	74.076	74.075	0	-1	-2
AP 73	Marie Ave	696238.3	299544.5	70.874	70.870		70.869	-4		-5
AP 74	Marie Ave	696260.9	299489.2	80.330	80.325		80.325	-5		-5
AP 75	Marie Ave	696280.1	299452.9	86.876	86.870		86.872	-6		-4
AP 77	Mt Albert Rd	696539.6	299487.2	82.751	82.744	82.747	82.746	-7	-4	-5
AP 78	Mt Albert Rd	696559.4	299551.5	81.022	81.015	81.018	81.017	-7	-4	-5
AP 79	Mt Albert Rd	696558.5	299588.5	78.663	78.657	78.658	78.658	-6	-5	-5
AP 80	Mt Albert Rd	696561.9	299691.5	71.414	71.408	71.408	71.408	-6	-6	-6
AP 81	Mt Albert Rd	696500.8	300015.1	58.435	58.435	58.433	58.433	0	-2	-2
AP 82	Mt Albert Rd	696507.0	299990.9	58.505	58.505	58.503	58.504	0	-2	-1
AP 83	Mt Albert Rd	696514.4	299967.0	58.863	58.863	58.862	58.862	0	-1	-1
AP 84	Mt Albert Rd	696520.4	299943.3	59.350	59.349	59.349	59.349	-1	-1	-1
AP 85	Mt Albert Rd	696516.2	299994.4	60.619	60.618	60.618	60.618	-1	-1	-1
AP 86	Mt Albert Rd	696524.8	299855.8	62.051	62.051	62.050	62.049	0	-1	-2
AP 87	Mt Albert Rd	696530.6	299833.5	62.733	62.733	62.732	62.731	0	-1	-2
AP 88	Mt Albert Rd	696541.7	299788.5	64.828	64.826	64.825	64.824	-2	-3	-4
AP 89	Mt Albert Rd	696560.9	299777.8	65.939	65.936	65.936	65.935	-3	-3	-4
AP 90	Mt Albert Rd	696562.9	299734.3	68.687	68.684	68.685	68.684	-3	-2	-3
AP 91	Mt Albert Rd	696562.4	299712.5	70.075	70.073	70.073	70.072	-2	-2	-3

Station ID	Location	Coordinates		Averaged Level	Absolute Levels (metres RL)			Change from Averaged Level (mm)		
		mN	mE		Mar-05	Jun-05	Mar-06	Mar-05	Jun-05	Mar-06
AP 92	Mt Albert Rd	696560.5	299673.8	72.613	72.611	72.613	72.613	-2	0	0
AP 93	Mt Albert Rd	696559.9	299657.2	73.864	73.862	73.863	73.862	-2	-1	-2
AP 94	Mt Albert Rd	696558.6	299610.3	77.101	77.098	77.100	77.099	-3	-1	-2
AP 95	Mt Albert Rd	696559.2	299570.0	79.957	79.952	79.955	79.954	-5	-2	-3
AP 96	St Andrews Rd	696582.9	299641.1	77.897	77.895	77.896	77.895	-2	-1	-2
AP 97	St Andrews Rd	696607.7	299646.9	80.321	80.319	80.320	80.318	-2	-1	-3
AP 98	Rowan Rd	696588.1	299763.7	68.501	68.499	68.500	68.498	-2	-1	-3
AP 99	Rowan Rd	696594.2	299786.1	69.478	69.476	69.477	69.475	-2	-1	-3
AP 100	Hillsborough Rd	696522.0	299784.9	62.966	62.964	62.963	62.963	-2	-3	-3
AP 101	Hillsborough Rd	696494.7	299787.0	61.359	61.357	61.357	61.355	-2	-2	-4
AP 102	Hillsborough Rd	696457.2	299761.1	60.006	60.005	60.004	60.003	-1	-2	-3
AP 103	Hillsborough Rd	696427.8	299719.8	59.404	59.403	59.401	59.400	-1	-3	-4
AP 104	Hillsborough Rd	696388.7	299693.0		Refer AP 104A					
AP 104A	Hillsborough Rd	696385.1	299690.2	59.554	59.555	59.553	59.553		-1	-1
AP 105	Hillsborough Rd	696373.8	299682.7	59.711	59.711	59.709	59.709	0	-2	-2
AP 106	Hillsborough Rd	696341.9	299660.5	60.458	60.459	60.457	60.457	1	-1	-1
AP 107	Hillsborough Rd	696324.6	299648.6	60.881	60.881	60.880	60.879	0	-1	-1
AP 108	Hillsborough Rd	696290.8	299628.8	62.060	62.060	62.059	62.059	0	-1	-1
AP 109	Hillsborough Rd	696270.0	299627.8	62.806	62.807	62.805	62.805	1	-1	-1
AP 110	Hillsborough Rd	696230.6	299619.6	64.997	64.997	64.993	64.994	0	-4	-3
AP 111	Hillsborough Rd	696213.1	299617.1	66.322	66.323	66.321	66.321	1	-1	-1
AP 112	Budock Rd	696247.8	299636.8	63.699	63.701	63.698	63.699	2	-1	0
AP 113	Budock Rd	696235.6	299662.4	65.546	65.548	65.546	65.547	2	0	1
AP 114	Budock Rd	696238.5	299707.3	65.879	65.883	65.882	65.883	4	3	4
AP 115	Budock Rd	696251.2	299753.1	67.579	67.581	67.579	67.580	2	0	1
AP 116	Budock Rd	696251.9	299773.3	69.485	69.487	69.485	69.486	2	0	1
AP 117	Budock Rd	696245.2	299811.8	70.833	70.836	70.834	70.835	3	1	2
OAP 118	Mt Albert Rd	696509.2	299918.4	59.895	59.895	59.894	59.892	0	-1	-3
AP 119	Haughey Ave	696165.2	299223.4	72.946	72.946		72.945	0		-1
AP 120	Haughey Ave	696109.9	299304.3	67.450	67.451		67.449	1		-1
AP 121	Haughey Ave	696056.8	299385.1	66.666	66.666		66.665	0		-1
AP 122	Haughey Ave	696006.9	299462.7	66.032	66.033		66.030	1		-2
AP 123	Haughey Ave	695958.9	299555.5	73.227	73.227		73.224	0		-3
OAP 125	Hillsborough Rd	695847.4	299535.5	69.958	69.959		69.957	1		-1
SS 1976	Hillsborough Rd	695759.4	299503.9	71.137	71.138		71.136	1		-1
AP 126	Carr Rd	695885.7	299463.4	65.133	65.134		65.132	1		-1
OAP 127	Carr Rd	695905.6	299370.9	61.441	61.443		61.440	2		-1
RM 7441	Carr Rd	695901.9	299261.4	58.499	58.501		58.498	2		-1
AP 129	Carr Rd	695939.0	299189.3	58.144	58.147		58.142	3		-2
OAP 130	Dornwell Rd	696185.8	298907.6	60.670	60.672		60.669	2		-1
OAP 131	Hayr Rd	696067.4	299157.7	63.120	63.121		63.121	1		1
OCP 41B	Carr/Hayr Rds	695981.2	299080.4	58.362	58.364		58.362	2		0
AP 132	Carr Rd	696043.8	298963.6	58.403	58.405		58.403	2		0
AP 133	Carr Rd	696128.8	298776.8	58.156	58.158		58.156	2		0
AP 134	Carr Rd	696177.9	298685.5	58.033	58.034		58.033	1		0
AP 135	Frost Rd	696157.9	298506.1	57.399	57.401		57.399	2		0
AP 136	Frost Rd	696363.4	298640.3	59.265	59.265		59.265	0		0