Appendix 7-4 – Previous Groundwater Quality Data

borehole pairs are presented in Appendix 2.4.13.

Table 2.4.9: Vertical Groundwater Gradients

Borehole Pair	Date				
	16/01/2003	03/02/2003	18/07/2003	10/01/2007	Mean
GW1D					
GW1S	0.129	0.139	1.129	0.364	0.44
GW2D					
GW2S	-0.463	-0.468	-0.438	-	-0.455
GW3D					
GW3S	0.507	0.522	0.467	0.517	0.503
GW4D					
GW4S	0.519	0.579	0.499	-	0.519
GW5D					
GW5S	-0.259	-0.214	-1.154	-0.431	-0.515
GW6	0.055	0.43	0.37	-	0.285

2.4.10 Groundwater Chemistry

As part of the first sampling round, 11 No. groundwater samples were obtained from the monitoring borehole network on the 4th February 2003 to establish background groundwater quality. Monthly and annual monitoring has been carried out subsequently and results are presented Tables 2.4.10, Table 2.4.11 and Table 2.4.12. A brief interpretation of the chemistry is provided below. The locations of where the samples were taken are shown on Drawing 3369-2407.

Prior to the water sampling survey, each borehole was purged to expel any groundwater standing within the standpipe and gravel pack. The purging of the standpipes was undertaken for over 90 minutes using an air compressor and a ½-inch air-line. The air-line was lowered gradually to the base of each borehole to expel the standing groundwater and to develop and clean the gravel pack surrounding the screened section of the borehole. The samples were obtained from the borehole standpipe immediately following the purging using a disposable bailer.

General Chemistry

The groundwater signature is calcium bicarbonate type. The pH of the groundwater varies within the range of 6.93 to 8.08. There does not appear to be any difference in the pH between the shallow boreholes (range 7.6 to 8.0) and the deeper boreholes (range 7.7 to 8.0).

Electrical Conductivity recorded at all monitoring locations were within the EPA Interim Guideline Value of 1000 µS/cm for groundwater with the exception of GW1S in March

2007 (1014 µS/cm). The electrical conductivity of the deeper groundwater (range 286 to 776 µS/cm) is lower than the shallow groundwater (range 577 to 1014 µS/cm).

The impact of the water infiltrating through the peat to the boreholes is considered to have impacted both the pH and the conductivity.

The reported Total Alkalinity is greater than the Total Hardness in GW1D, GW1S, GW2D, GW2S, GW4S, GW5D, GW5S and GW6PW. These are an indication of natural ion-exchange and confirm the semi-confined nature of the groundwater.

The dissolved oxygen concentration is considered low, but the deeper groundwater is more depleted than the shallow groundwater. This suggests that the oxygen saturation is depleted as the water percolates to the bedrock. The COD varies within the range of 87-178mg/l O_2. There does not appear to be any discernable trends in the concentration, however the chemical oxygen demand appears to be higher in the shallow groundwater.

The total solids concentration is high for all samples, however the suspended solids concentration appears to be the dominant factor. This is not unexpected as the wells are only periodically pumped and the sediment content would take a long time to clear.

Ammonia

Ammonia concentrations are significantly elevated above normal background levels within all of the boreholes (deep and shallow), ranging from 0.4 mg/l as N (GW2S) to 8.1mg/l and 8.7mg/l as N in GW-1S, and GW-1D respectively. See Table 2.4.12.

The reduction of free nitrogen occurs due to the reducing environment of the peat, where there is a deficiency of available oxygen. The fact is borne out by the generally low concentration of Nitrite and Nitrate. The Drehid Waste Management Facility is located within a cut-away peat land. Groundwater beneath peatlands has been found to be naturally high in nitrogen and, due to the nature of the peatlands (reducing conditions) the nitrogen is present in the reduced form (ammonia). The ammonia concentrations remain elevated as it is not oxidised to nitrite or nitrate. The nitrate concentrations are low in all of the boreholes, similar to previous results, with none detected above the limit of detection in the deeper boreholes (<0.05 mg/l as N), and nitrate only detected in GW2S within the shallow boreholes at a level of 0.21 mg/l as N. This concentration is significantly lower than that detected in the baseline monitoring (5.8 mg/l as N) at this borehole.

Chloride

Concentrations detected on 11th August 2006 (12.5 – 16.6 mg/l) are generally lower than the concentrations recorded on the 4th February 2003 (21 – 68 mg/l) with concentrations

significantly lower in GW7 (68 to 14.1 mg/l). The concentrations appear to be slightly higher in the shallow boreholes (14.4 – 16.6 mg/l) compared to the deeper boreholes (12.5 – 14.4 mg/l). Monthly monitoring in 2007 indicates chloride concentrations are typically less than 15 mg/l.

Sulphates

The sulphate concentration varies significantly between monitoring points and between monitoring events. The recorded concentrations from 2006 are low across the site with no concentrations detected in the deeper boreholes and the highest concentration recorded at 14.9mg/l in GW-2S. These concentrations show a significant reduction from those recorded in 2003 when levels ranged from <3 mg/l to 59 mg/l in GW1D.

Fluoride

The concentration of fluoride is below the detection limit of the laboratory.

Phosphorous & Phosphates

The levels of Total P recorded on 11th August 2006 were consistently low across the site showing only minor fluctuations between boreholes. With the exception of GW1D (0.57 mg/l), results were generally lower in the deeper boreholes (<0.05 to 0.14 mg/l), in comparison to the shallower boreholes (0.31 to 0.57 mg/l). Total Phosphorous was not analysed for in the 2003 monitoring event. Phosphates were not detected above the limit of detection at any of the sampling locations during the 2003 monitoring event. This is a reduction when compared to the 2006 monitoring event where levels ranged from 0.2 to 1.2 mg/l P04.

Cations

The concentrations of sodium, potassium and magnesium vary significantly and there do not appear to be any discernable trends, and the high concentrations are likely to be naturally occurring.

Concentrations of potassium, magnesium, calcium and sodium are comparable between monitoring events with concentrations varying greatly between the boreholes over the site and showing no discernible trend between the shallow and deep boreholes. The concentration of calcium are within normal ranges for groundwater within carbonate based subsoil and bedrock.

Calcium concentrations in the shallow boreholes exceeded the IGV in two of the monitoring locations (namely GW2S (202 mg/l) and GW3S (203 mg/l) in the 2006 monitoring event. Both these concentrations show an increase from 2003. An increase was also noted in GW4S (108 to 156 mg/l) while concentrations remain constant in GW1S. There were no exceedances of the IGV's in concentrations of potassium, magnesium, and sodium. Potassium concentrations are low, ranging from 0.8 mg/l to 4.2

mg/l. Magnesium concentrations recorded for 2003 and 2006 are similar, while reductions were noted in GW1S (44 to 7.4 mg/l) and GW2S (34 to 23 mg/l). Sodium concentrations (range 9.9 to 40 mg/l).

Calcium concentrations in the deeper boreholes there were no exceedances of the IGV's for any of the cations. Calcium levels generally remain similar to previous results with the exception of GW6 were an increase was noted (43.5 to 112 mg/l). Levels of potassium generally showed a decrease from previous levels (average 2 mg/l (2003) to 1.5 mg/l (2006)) with the exception of GW7 (1 to 2.9 mg/l) which showed a slight increase.

Metals

The concentration of trace metals are generally low for all boreholes however some isolated spikes are noted in certain boreholes. The occurrence of elevated concentration of trace metals in the groundwater is considered to result from the mobilisation of metals in the groundwater in a reducing environment. The concentration of manganese seems to be endemic to groundwater in this area.

There were no concentrations of aluminium, beryllium, chromium, cadmium, copper, tin, antimony, sliver, or selenium detected in any of the groundwater monitoring boreholes during 2006. This is similar to the 2003 monitoring event with the exception of trace concentrations of copper (29 µg/l) and selenium (9µg/l) detected GW7, and copper in GW1S (7 µg/l). Only trace concentrations of cobalt were detected in GW1D (8µg/l) and GW6 (7µg/l). Zinc, mercury and boron concentrations are generally low.

Elevated concentrations of arsenic were detected in 2006 in GW1S (25 µg/l), GW1D (142 µg/l), GW3D (24 µg/l), GW4D (15 µg/l) and GW6 (27 µg/l). These concentrations have all increased from the 2003 monitoring event and lie above the IGV level of 10 µg/l. All remaining boreholes lie between the IGV ranging between 3 and 8 µg/l. In the 2003 monitoring event elevated concentrations of arsenic were detected in GW1D (19 µg/l), GW3D (22 µg/l), and GW6 (22 µg/l). The source of the arsenic is unknown however it is noted that "*concentrations in groundwater in some areas are sometimes elevated as a result of erosion from natural sources"* (EPA 2001; Parameter of Water Quality). A literature review reveals several studies, which attribute arsenic concentrations to reducing conditions associated with peat deposits. Waste has not been deposited at the facility at the time of sampling and as such these results represent the natural geochemistry beneath the peatland.

Barium concentrations vary greatly over the site, however are generally higher within the shallow boreholes. Concentrations from 11th August 2006 recorded in GW1S (343µg/l), GW4S (521 µg/l), GW1D (327 µg/l) and GW6 (123 µg/l) all lie above the IGV of 100 µg/l. These concentrations are similar to that detected in the 2003 monitoring event

where concentrations ranged from 60 to 270 µg/l in the deeper boreholes and from 130 to 520 µg/l in the shallow boreholes and (as with arsenic concentration), are believed to be representative of the natural geochemistry beneath the peatlands.

Elevated concentrations of nickel were detected in GW1S (27 µg/l), GW2S (30 µg/l), GW1D (27 µg/l) in 2006. These results show an increase from 2003 where concentrations of 11µg/l, <10µg/l and <10µg/l were recorded. The remaining boreholes record concentrations below 20 µg/l.

VOC's, SVOC's and Pesticides

There were no concentrations of VOC's, SVOC's or pesticides detected in the 2006 monitoring round. In the 2003 monitoring round diesel range organics and mineral oil were detected. The interpretation of the compounds detected indicates that the related to lubricant oil used in the drilling of the boreholes. Polycyclic aromatic hydrocarbons were also recorded in GW2S and GW6, which are also related to the lubricant oil used in the drilling. The presence of microbial organisms in the groundwater is an external factor related to the drilling. The boreholes were not disinfected prior to sampling.

The chemistry of the deep groundwater encountered in GW7 is significantly different to the other samples obtained within the site. The water has a low level of mineralisation, which is often less than 50% of the average of the other samples. The concentration of calcium, sodium, potassium, chloride and bicarbonate are low. An explanation of the lower than expected level of dissolved minerals is to suggest a flow system through weathered rock from which all the readily soluble minerals have been leached. The concentration of iron and manganese is elevated with respect to the low mineralisation of other parameters; however this could be natural to the groundwater at depth. The water appears to be older than the shallower groundwater and occurs in an environment with very low free oxygen.

Coliforms

There were no concentrations of coliforms (total or faecal) detected in the groundwater monitoring boreholes during the 2006 monitoring event. These concentrations show a significant reduction from the previous baseline monitoring event where concentrations ranged from 28 to 34,480 no. 100 ml total coliforms. This may be as result of the groundwater sampling procedure.

Table 2.4.10: Groundwater Chemistry from Samples obtained on 04/02/2003

Parameter	Units	M.A.C.	Detection Limit	GW 1D	GW 1S	GW 2D	GW 2S	GW 3D	GW 3S	GW 4D	GW 4S	GW 5D	GW 5S
pH			0.01	7.51	7.17	7.46	6.93	7.66	7.16	7.75	7.55	7.56	7.53
Electrical conductivity EC	mS/cm	6.5< pH < 9.5	0.014	0.835	1.043	0.755	0.983	0.319	0.936	0.493	0.722	0.9	0.71
Dissolved oxygen (DO)	mg/l	2500	0.1	4.9	6.1	7.6	6.8	5.4	6.6	8.8	7.5	7.9	8.4
Redox potential	mV	n/a		121	14	120	124	102	126	110	119	128	128
COD	mg/l	n/a	10	178	176	166	193	87	167	95	133	107	114
Total solids	mg/l	n/a	1	18579	34946	8693	48647	3152	16635	1557	22710	80762	14169
Total suspended solids	mg/l	n/a	10	16476	31904	10616	43392	2916	15050	1270	18930	73980	11390
Total hardness (as CaCO3)	mg/l	60 MRC	5	320	520	266	478	300	312	366	258	300	220
Total alkalinity (as CaCO3)	mg/l	30 MRC	1	380	570	460	520	210	240	290	380	370	350
Ammonia as NH4-N	mg/l	0.3	0.2	8	1.9	2	2.1	0.5	6.6	0.8	6.1	3.2	7.6
Nitrate NO3	mg/l	50	0.3	0.3	0.3	2.6	25.6	0.05	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nitrite NO2	mg/l	0.5	0.05	0.07	0.18	0.39	0.68	0.18	0.1	< 0.05	0.11	< 0.05	0.3
TON	mg/l	n/a	0.3	< 0.3	< 0.3	0.7	6.1	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Chloride Cl	mg/l	250	1	31	21	44	37	20	39	36	31	37	41
Fluoride F	mg/l	1	0.01	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sulphate SO4	mg/l	250	3	59	31	14	45	10	4	4	13	< 3	55
ortho-Phosphate PO4	mg/l	5	0.03	0.2	0.3	0.2	0.2	0.2	0.2	0.3	1.2	0.2	2.6
Potassium K	mg/l	12	0.2	3.2	0.8	1.8	4.1	1.3	2.9	1.4	2.4	3	2.1
Sodium Na	mg/l	200	0.2	39.5	9.2	32	16.8	12.4	17	15.5	40	64	12.2
Calcium Ca	mg/l	200	0.05	124.9	156	128	152	48.51	161.7	81.74	108.5	117.8	119.1
Magnesium Mg	mg/l	50	0.05	11.11	44.06	9.7	34.72	7.56	11.33	13.68	17.14	11.81	9.64
Aluminium Al	mg/l	0.2	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Zinc Zn	mg/l	1	0.005	0.007	0.011	0.005	0.008	0.017	0.006	< 0.005	< 0.005	0.006	0.006
Iron Fe	mg/l	0.2	0.001	0.008	0.023	0.005	0.02	0.003	0.014	0.002	0.002	0.003	0.004
Manganese Mn	mg/l	0.05	0.001	0.006	0.272	0.084	0.409	0.082	0.151	0.006	0.142	0.383	0.26
Barium	mg/l	0.5	0.05	0.12	0.1	0.27	0.18	0.09	0.52	0.17	0.13	0.1	0.4
Boron	mg/l	1	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Lead Pb	µg/l	10	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Copper	µg/l	2000	5	< 5	7	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Mercury Hg	µg/l	1	0.05	0.12	0.11	< 0.05	< 0.05	0.1	0.05	0.23	0.11	0.08	0.27
Nickel Ni	µg/l	20	10	< 10	11	< 10	< 10	14	14	< 10	< 10	18	13
Arsenic	µg/l	10	5	19	< 5	< 5	< 5	22	6	8	< 5	< 5	< 5
Cyanide CN	µg/l	50	50	60	< 50	< 50	< 50	< 50	< 50	< 50	< 50	170	< 50
Cadmium Cd	µg/l	5	0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium Cr	µg/l	50	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Silver Ag	µg/l	10	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Selenium	µg/l	10	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Total Phenols (HPLC)	mg/l	0.0005	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Diesel Range Organics (DRO)	µg/l	10	10	< 10	< 10	< 10	3303	< 10	4441	< 10	1649	5533	2731
Mineral Oil	µg/l	10	10	< 10	< 10	< 10	1486	< 10	1776	< 10	< 10	1383	956
Petrol Range Organics C4-C10	µg/l	10	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Petrol Range Organics C10+	µg/l	10	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
BTEX (MTBE) Compounds	µg/l	10	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
PAH (16 EPA Compounds)	ng/l	100	10	< 10	< 10	< 10	1332	< 10	< 10	< 10	< 10	< 10	< 10
Semi-Volatile Organic Compounds	µg/l		1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	7	< 1	< 1
Volatile Organic Compounds	µg/l		1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Coliforms	c.f.u./100ml	0	1	1450	2880	4130	34480	1480	81640	28	310	4590	1460
Faecal Coliforms	c.f.u./100ml	0	1	6	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1
Ionic Balance	%			4.22%	14.14%	5.10%	9.19%	0.19	37.97	8.43	15.97	26.72	2.21

Legend

M.A.C = Maximum Admissable Concentration under S.I. No. 439, 2000(European Communities Drinking Water Regulations).
< = Less than

Table 2.4.11: Results of Chemical Analysis of Groundwater (11/7/2006)

Parameter	Component	Units	M.A.C	Detection	GW-1S	GW-1D	GW-2S	GW-3S	GW-3D	GW-4S	GW-4D	GW-6	GW-7
pH	-	pH units	≥ 6.5 & ≤ 9.5	-	7.7	7.8	8	7.6	8	7.7	7.8	7.9	7.7
Conductivity @ 25ºC	-	µS/cm	1000	-	722	742	820	577	313	782	489	615	286
Ammonia (NH3-N)	-	mg/l	0.3	<0.02	8.1	8.7	2.7	5.6	0.41	7.2	0.74	7	1.19
Total Phosphorous	-	mg/l	-	<0.05	0.57	0.57	0.31	0.56	0.14	0.46	0.1	<0.05	0.08
Anions	Chloride	mg/l	250	<0.5	14.4	14.4	15.6	16.6	12.5	15.1	13	14.1	14.1
	N03-N	mg/l	11.3	<0.05	<0.05	<0.05	0.21	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	P04-P	mg/l	-	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
	SO4	mg/l	250	<0.5	<0.5	<0.5	14.9	1.4	<0.5	1.1	<0.5	<0.5	<0.5
Boron (Dissolved)	-	µg/l	1000	<2	3	18	28	25	17	23	22	18	13
Comb Pesticide Suite	All Components	µg/l	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	-	µg/l	1	<1	<1	<1	<1	<1	<1	<1	<1	15	<1
Metals (Dissolved)	Arsenic	µg/l	10	<2	25	142	3	8	24	5	15	27	5
	Silver	µg/l	10	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Aluminium	µg/l	200	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Beryllium	µg/l	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Barium	µg/l	500	<2	343	327	521	471	53	206	65	123	29
	Chromium	µg/l	50	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Cadmium	µg/l	5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Cobalt	µg/l	-	<2	3	8	5	<2	<2	<2	<2	7	<2
	Copper	µg/l	2000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Manganese	µg/l	50	<2	118	72	307	221	88	330	91	59	213
	Tin	µg/l	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Nickel	µg/l	20	<2	27	27	30	10	4	5	4	16	<2
	Lead	µg/l	25	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Antimony	µg/l	-	<2	2	<2	<2	<2	<2	<2	<2	<2	<2
	Selenium	µg/l	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Zinc	µg/l	100	<2	<2	3	34	81	2	<2	2	10	9
Metals Scan	Calcium	mg/l	200	<0.1	151	151	202	203	50	156	78	112	38
	Iron	mg/l	0.2	<0.1	0.1	0.1	0.3	0.3	<0.1	0.1	0.1	0.1	<0.1
	Potassium	mg/l	12	<0.1	1.3	1.4	1.1	1.6	0.6	1.9	1.1	1.7	2.9
	Magnesium	mg/l	50	<0.1	7.4	7.6	23	12	7.8	16	<2	9	7.1
	Sodium	mg/l	200	<0.1	9.9	13	12	14	9.1	12	<2	17	13
SVOC's	All Components	µg/l	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
VOC's USEPA 524.2 µg/l	All Components	µg/l	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
VOC's by GC-FID	All Components	mg/l	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Coliforms	-	MPN/100mls	0/100mls	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
e.Coli	-	MPN/100mls	0/100mls	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

M.A.C = Maximum Admissable Concentration under S.I. No. 278, 2007 (European Communities Drinking Water Regulations).

Table 2.4.12: Results of Chemical Analysis of Groundwater for monthly monitoring of ammonia, chloride and conductivity

Conductivity (µS/cm) 2007													
	Aug-06	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
GW-1S	722	836	934	1017	1029	768	768	**1018**	912	860	808	833	823
GW-1D	742	726	750	328	1132	802	719	718	725	722	741	735	735
GW-2S	820	905	887	942	1050	897	897	202	946	900	994	896	1027
GW-2D													
GW-3S	577	774	787	851	975	832	821	220	840	820	829	845	855
GW-3D	313	322	327	350	375								
GW-4S	782						486						
GW-4D	489						759						
GW-5S		686	792	863	900	766	753	163	786	779	756	743	791
GW-5D		776	683	703	526	618	608	138	873	785	766	733	736
GW-6	615	615	628	675	966	602	618						
Ammonia (mg/l) 2007													
	Aug-06	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
GW-1S	8.1	0.87	2.25	2.3	3.36	0.49	6.2	0.75	4.1	5.2	5.6	6.3	6.2
GW-1D	8.7	6.4	7.9	5.1	8.4	0.42	8.1	8	7.86	8.3	8.2	8.6	8.4
GW-2S	2.7	0.5	0.4	0.63	0.97	2.03	1.58	0.89	0.9	2.2	1.93	2.54	1.23
GW-2D													
GW-3S	5.6	3.09	4.53	5.3	5.4	5.3	5.1	2.09	4.37	4.88	5.1	5.4	3.04
GW-3D	0.41	0.42	0.41	0.43	0.37								
GW-4S	7.2						8						
GW-4D	0.74						0.58						
GW-5S		7.2	7.5	6.9	7.4	6.9	6.4	7	6.91	7.3	7.3	6.9	7.4
GW-5D		2.49	1.88	2.14	2.62	2.25	2.38	3.61	2.93	2.21	5.9	4.67	4.67
GW-6	7	6.6	7.2	4.04	7.2	0.54	7						
Chloride (mg/l) 2007													
	Aug-06	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
GW-1S	14.4	13	13	12	12	13	13	7	17	13	13	14	14
GW-1D	14.4	14	14	13	12	13	13	12	15	19	13	19	14
GW-2S	15.6	15	23	15	14	15	14	12	17	15	15	15	12
GW-2D													
GW-3S	16.6	21	16	16	15	17	15	17	17	17	18	15	17
GW-3D	12.5	11	11	11	11								
GW-4S	15.1						14						
GW-4D	13						12						
GW-5S		10	11	10	9.9	11	10	9.7	11	11	13	11	11
GW-5D		8.9	11	3.59	10	13	11	9.4	11	9.4	14	12	9.5
GW-6	14.1	13	13	13	12	14	13						