Gwynedd Council

Ffridd Rasus Landfill

Environmental Monitoring Report July to September 2014 – Final Report

27 January 2015

Amec Foster Wheeler Environment & Infrastructure UK Limited

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Report for

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No.	Details	Date
1	Draft Report	21 November 2014
2	Final Report	27 January 2015

Executive Summary

This report has been produced for the purpose of presenting the results of environmental monitoring that has continued at Ffridd Rasus Landfill during this latest reported monitoring period, July to September 2014. Area 2 (unlined closed landfill) & Civic Amenity and Area 3 (engineered landfill) are regulated under the conditions of Environmental Permit (EP) ref: PP3294FJ/V008 (dated 21 April 2013) and EP ref: GP3330BY (Variation Notice number QP3134LY/V004 dated 21 March 2013), respectively. Area 3 closed to the receipt of wastes in January 2014 and Cell 4 was capped and restored in March 2014.

Leachate monitoring in Area 3 showed levels below the EP limit of 1.5 m above base and quality within the range of previous data throughout the reporting period except for ammoniacal-nitrogen concentrations in Cell 4A, which exceeded the previous maximum. This is consistent with Cell 4A having the most recently deposited waste. Leachate monitoring points in Area 2 continued to be recorded as dry during this quarter.

All of the groundwater boreholes showed a downward trend in water levels consistent with low rainfall during the monitoring period. Groundwater monitoring data continue to show impacts in downgradient boreholes, reflecting contaminant migration from the unlined Area 2 landfill. Chloride and ammoniacal-nitrogen concentrations in the downgradient edge of Area 2 generally increase southwards towards BH27 where maximum concentrations of 271 mg/l and 173 mg/l, respectively, were recorded in this quarter.

The highest ammoniacal-nitrogen concentrations (>100 mg/l) continue to be recorded in boreholes BH27 and BH36 (downgradient edge of Area 2) and BH20B and BH30 (downgradient of Areas 2 and 3). The highest chloride concentrations (>200 mg/l) were recorded in borehole BH27 (downgradient of Area 2 and upgradient of Area 3) and BH20A, BH20B, BH21A and BH30 (downgradient of Areas 2 and 3). Concentrations at the downgradient edge of Area 3 continue to be elevated which reflect the downgradient migration of the leachate plume derived from the unlined Area 2. Chloride concentrations in boreholes BH18A and BH18B (cross-gradient) continue to slightly exceed typical baseline values and reflect the westward passage of water affected by saline runoff which infiltrated the ground via the surface water lagoon. Over time this effect is diminishing.

The groundwater quality trigger levels specified in the EP (ref GP3330BY) for Area 1 and 3 were exceeded for chloride in BH19A, BH19B, BH19C and BH20A and for ammoniacal-nitrogen in BH19C, BH20A and BH21A. These exceedances reflect the downgradient migration of the leachate plume from the unlined Area 2.

Ammoniacal nitrogen and chloride concentrations at the surface water monitoring locations varied as follows: SW1 (Area 1 permitted discharge) and the pipe adjacent to SW1 were dry; concentrations at SW2 (ditch flowing south along downstream boundary of Area 3) continued to be above the range measured previously (possible reasons for the increased levels are under investigation); and concentrations at SW3 (ditch exiting the downstream boundary of Area 3) remained within the range recorded previously except for chloride which increased to 223 mg/l in August. Chloride concentrations decreased to 149 mg/l in October.

Landfill gas monitoring for the latest quarter was consistent with previous data and show no evidence of off-site landfill gas migration. None of the trigger levels for methane or carbon

dioxide have been exceeded in the perimeter monitoring boreholes during the monitoring period. Wastes in Area 3 are continuing to produce landfill gas with methane and carbon dioxide concentrations within historical ranges for all locations and parameters.

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1. Introduction

Ffridd Rasus Landfill Site is located approximately 3 km north of Harlech and received predominantly municipal waste up to closure in January 2014. The site is operated by Gwynedd Council. Area 2 of the landfill received waste between 1981 and 2007 and is capped and in its aftercare phase. Area 2 is regulated under the conditions of EP ref PP3294FJ/V008 (dated 21 May 2013). Area 3 commenced accepting waste in April 2007 and is regulated under the conditions of EP ref GP3330BY (latest Variation Notice number QP3134LY/V004 dated 21 March 2013). The periods of filling and capping in Area 3 were as follows:

- Cells 1 and 2: filled between 2007 and 2011, with capping works completed in June 2011;
- Cell 3: filled between January 2011 and June 2012 with capping works completed in February 2013; and
- Cell 4A and Cell 4B filled between June 2012 and January 2014 and capped in February to March 2014.

This report presents the results of environmental monitoring carried out at Ffridd Rasus Landfill site during the period April to June 2014, together with earlier data in order to present data trends. Surface water, groundwater, leachate and gas monitoring have been undertaken by Gwynedd Council. Leachate, surface water and groundwater samples are sent to ALS Environmental Ltd in Coventry for analysis.

1.1 Leachate Monitoring

When conditions allow, leachate quality and level are monitored six-monthly at locations LW4a, LW5a, LW6a and LW13 in Area 2 as required by the EP ref: PP3294FJ/V008. For a long period, levels have been too low to obtain samples from these monitoring points. In Area 3, leachate level measurements are monitored weekly and leachate quality monthly as required by the EP ref: GP3330BY. The leachate sampling regime at Ffridd Rasus is shown in Table 1.1. Monitoring locations are shown on Figure 1.

Table 1.1 Leachate Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 LW4a, LW5a, LW6a, LW13.	Six monthly	Level, Temperature, Cl, pH, EC, NH4, Ca, Mg, K, Na, Alkalinity, TOC, SO4, TON, phenol, COD, BOD.
	Annually	As quarterly plus Cd, Cr, Cu, Fe, Pb, Mn, Ni, Zn and hazardous substances.
Area 3 LM1/1, LM1/2, LM2/1, LM2/2, LM3/1, LM3/2*	Monthly	Temperature, leachate level, pH, EC, NH4 and Cl.
	Quarterly	As monthly plus Ca, Mg, K, Na, Alkalinity, TOC, SO4, TON, phenol, COD, BOD and Cd.
	Annually	As quarterly plus Cr, Cu, Fe, Pb, Mn, Ni, Zn and hazardous substances.

Note: * Leachate samples were generally taken from the leachate collection tank, with the cell source identified. As of January 2013, samples of leachate are collected individually from each of the four cells. Wells LM1/1, LM1/2, LM2/1, LM2/2, LM3/1, LM3/2 were connected to the gas extraction system in August 2013 and are no longer monitored. Leachate levels have been monitored at LCP1, LCP2, LCP3, LCP4/2 and LCP4/B since August 2013.

1.2 Groundwater Monitoring

Groundwater quality and level are monitored quarterly in Area 2 and monthly in Area 3 as required by EP ref PP3294FJ/V008 and EP ref GP3330BY, respectively. The groundwater sampling regime is presented in Table 1.2.

Three additional boreholes (BH34-BH36) were installed in March 2012 along the western margin of Area 2 as replacements for lost boreholes BH7, BH26 and NRA2 (see Figure 1). Sampling of these boreholes began in April 2012.

Table 1.2 Groundwater Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 BH1, BH15, BH18A, BH18B, BH19A, BH19B, BH19C, BH20A, BH20B, BH21A, BH21B, BH23, BH24, BH27-BH36 and NRA3	Quarterly	Water level, DO, pH, EC, NH_4, Cl, Ca, Mg, K, Na, Alkalinity, TOC, SO_4, TON, phenol and Cd
	Annually	As quarterly plus Cr, Cu, Fe, Pb, Mn, Ni and Zn.
Area 3 BH1, BH15, BH18A, BH18B, BH19A, BH19B, BH19C, BH20A, BH20B, BH21A, BH21B, BH23, BH24, BH27-BH36 and NRA3	Monthly	Level, Temperature, pH, EC, NH_4, Cl and DO.
	Quarterly	As monthly plus Ca, Mg, K, Na, Alkalinity, TOC, SO_4, TON, phenol and Cd.
	Annually	As quarterly plus Cr, Cu, Fe, Pb, Mn, Ni and Zn.

1.3 Surface Water Monitoring

Surface water quality is monitored six-monthly in Area 2 and monthly in Area 3 at locations SW1, SW2 and SW3 as required by EP ref: PP3294FJ/V008 and EP ref: GP3330BY, respectively. The surface water sampling regime is identified in Table 1.3. Weekly observations of the appearance of the water are also made at locations SW1 and SW3. Sampling of the discharge from a pipe near to location SW1 has also been included in the monitoring regime since October 2011. Since the installation of the new interceptor, both sampling points SW1 and SW1 (pipe) have been relocated westwards, to the discharge point of the new operational interceptor (see Figure 1). Sampling at this new location began in December 2012.

Table 1.3 Surface Water Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 SW1, SW2 and SW3	Six-monthly	Cl, COD, DO, EC, NH_4, pH and Temperature.
Area 3 SW1*, SW2 and SW3	Monthly	Cl, COD, DO, EC, NH_4, pH and Temperature.

*Discharge from pipe adjacent to SW1 also sampled if flowing.

1.4 Landfill Gas Monitoring

Landfill gas is monitored in boreholes located around the site perimeter: two locations for Area 2 and five locations for Area 3 as required by EP ref PP3294FJ/V008 and EP ref GP3330BY, respectively. The gas monitoring regime is shown in Table 1.4.

Table 1.4 Gas Monitoring Regime

Monitoring Location	Frequency	Parameter
Area 2 BHG03 and BHG04	Six-monthly	Methane and carbon dioxide.
Area 3 BHG01 to BHG05	Monthly	Methane and carbon dioxide.

Note: Borehole BHG05 has been destroyed.

The locations of all monitoring points are shown on Figure 1. In addition, records of meteorological data for the site are kept, which include temperature, rainfall and wind speed. These are included in Appendix H.

2. Leachate and Groundwater Levels

2.1 Leachate Levels

2.1.1 Area 2

Monitoring points LW4A, LW5A, LW6A or LW13 have been dry for a long period and continued to be dry in this reporting period.

2.1.2 Area 3

Time-series plots for weekly leachate levels since January 2011 are shown in Appendix A. A summary of the leachate levels measured during the period July to September 2014 is presented in Table 2.1. The data show:

- Cell 1: levels showed little variability and ranged between 1.05 and 1.14 m above base;
- Cell 2: levels increased from 0.94 in July to 1.07 m above base by mid September falling to 0.95 m above base by the end of September;
- Cell 3: levels decreased from 1.21 to 0.82 m above base in early July and then increased to 1.01 m above base during the remainder of this quarter;
- Cell 4A: levels showed some variability but remained within the range 0.87 to 1.25 m above base;
- Cell 4B: levels showed some variability but remained within the range 0.88 to 1.09 m above base.

Leachate levels in this reporting period were generally within the range of values measured in previous monitoring and were below the EP leachate head limit of 1.5 m.

Table 2.1 Leachate Head Measurements for July to September 2014

Date	Leachate Head (m above base)				
	Cell 1	Cell 2	Cell 3	Cell 4A	Cell 4B
	LCP1	LCP2	LCP3	LCP4/2	LCP4/B
07/07/2014	1.11	0.94	1.21	0.87	0.93
14/07/2014	1.11	0.96	0.82	0.93	0.97
21/07/2014	1.11	0.96	0.84	0.99	1.00
28/07/2014	1.11	0.96	0.87	1.05	1.03
04/08/2014	1.12	0.98	0.88	1.13	1.06
11/08/2014	1.14	1.00	0.89	1.23	1.09
18/08/2014	1.12	1.00	0.90	0.99	0.98
25/08/2014	1.12	1.01	0.92	1.00	1.02
01/09/2014	1.12	1.02	0.94	1.02	1.05
08/09/2014	1.12	1.04	0.96	1.05	1.02
15/09/2014	1.12	1.06	0.98	1.23	1.03
22/09/2014	1.12	1.07	1.01	1.25	1.03
29/09/2014	1.05	0.95	1.01	0.91	0.88
Historical Range (min-max)	*0.88 – 1.35*	*0.7 – 1.48*	*0.51 – 1.49*	*0.12 – 1.46*	*0.53 – 1.42*

2.2 Groundwater Levels

Table 2.2 shows the range of groundwater levels recorded during the period July to September 2014. Groundwater level data since February 2000 is presented graphically in Appendix B. The groundwater hydrographs have been split into three groups for ease of presentation as follows:

- Boreholes drilled prior to 2004;
- Boreholes drilled during 2004; and
- Boreholes drilled during 2006 and 2012.

Table 2.2 Summary of Groundwater Level Data July to September 2014

Borehole	Groundwater Level (m AOD)[a]			Historical Range (m AOD)[a, b]	
	July	August	September	Min	Max
BH1	5.64	5.49	5.42	5.35	7.30
BH15	5.89	5.73	5.40	5.19	7.65
BH18A	4.55	4.49	4.29	4.41	5.88
BH18B	5.20	5.00	4.90	4.63	5.87
BH19A	4.52	4.52	4.08	3.48	5.02
BH19B	4.28	4.16	4.07	4.09	5.17
BH19C	4.24	4.29	3.98	3.98	5.12
BH20A	4.09	4.03	3.98	3.28	5.07
BH20B	4.03	4.00	3.93	3.00	5.07
BH21A	4.08	3.99	3.89	3.46	4.87
BH21B	4.13	3.99	3.94	3.79	4.9
BH23	3.04	3.04	2.89	2.87	4.47
BH24	5.16	4.98	4.77	4.98	6.86
BH27	4.46	4.34	4.20	4.19	5.46
BH28	4.61	4.48	4.33	4.37	5.76
BH29	4.25	4.13	4.03	4.07	5.59
BH30	3.88	3.79	3.74	3.73	4.54
BH31	4.06	3.98	3.98	3.81	4.51
BH32	4.17	4.05	4.02	3.85	5.78
BH33	5.13	4.93	4.79	4.76	6.71
NRA3	4.58	4.47	4.33	4.32	6.26
BH34	5.29	5.17	5.01	5.02	6.25
BH35	5.32	5.15	5.02	5.18	6.22
BH36	5.21	5.09	4.93	5.05	6.16

Note: a) Monthly monitoring data; b) Data for February 2000 to June 2014.

During the latest monitoring period, groundwater levels in all boreholes recorded declining levels, following the trend during the previous quarter. Some of boreholes showed levels slightly below the previous minimum historical low (BH18A, BH19B, BH24, BH28, BH29 and BH35). The seasonal fall in groundwater levels during is due to limited recharge over the summer months. Rainfall records from the site rain gauge show several periods of low rainfall during latest monitoring period compared to the previous quarter, in particular July and September (Appendix H). Rainfall monthly totals for July, August and September were 20.8, 73.4 and 12.7 mm respectively, compared to 39.5, 77.5 and 40.9 mm in April, May and June, respectively.

3. Leachate Quality

3.1 Area 2

Monitoring points LW4A, LW5A, LW6A and LW13 in Area 2 were dry in the latest quarter and therefore samples could not be obtained. Data collected during the period 2006-2008 indicated an improving trend in leachate quality in this area of the site, as shown on the data plots in Appendix A. More recent data have not been collected since the monitoring points have been dry for a long period following capping of Area 2.

3.2 Area 3

Representative analytical results of the leachate quality monitoring during the latest quarter are presented in Table 3.1 and graphically in Appendix A, where they are included with long term leachate quality data. Laboratory analytical data sheets are included in Appendix D. Ammoniacal-nitrogen and chloride concentrations showed some variability but remained within the range of historical data except for ammoniacal-nitrogen in Cell 4A in July and September (1890 and 1870 mg/l, respectively), which exceeded the previous maximum of 1660 mg/l recorded in May 2014. This is consistent with Cell 4A having the most recently deposited waste.

Table 3.1 Selected Leachate Quality Results July to September 2014

Cell	Date	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Ammoniacal-Nitrogen (mg/l)	Chloride (mg/l)
Cell 1 (LCP1)	July 2014	8.1	23.1	9610	773	1010
	Aug 2014	n.m.	19.2	n.m.	n.m.	n.m.
	Sept 2014	7.7	19.4	9110	788	953
Cell 2 (LCP2)	July 2014	8.1	25.7	15600	1500	1640
	Aug 2014	n.m.	22.3	n.m.	n.m.	n.m.
	Sept 2014	7.8	21.6	15000	1480	1650
Cell 3 (LCP3)	July 2014	8	27	11800	1000	1240
	Aug 2014	n.m.	23.4	n.m.	n.m.	n.m.
	Sept 2014	7.7	23.9	11600	995	1280
Cell 4A (LCP4)	July 2014	8.1	26.1	18900	1890	2170
	Aug 2014	n.m.	20.7	n.m.	n.m.	n.m.
	Sept 2014	7.9	20.8	17700	1870	2040

Note: n.m. not measured.

4. Groundwater Quality

4.1 Monitoring Regime

Analytical results of the groundwater quality monitoring (ammoniacal nitrogen, chloride, cadmium and temperature) during the latest quarter are summarised in Table 4.1 and shown graphically in Appendix C, where they are included with long term groundwater quality data. Laboratory analytical data sheets are included as Appendix D. The groundwater monitoring boreholes have been split into three groups for ease of presentation as follows:

- Boreholes drilled prior to 2004 - BH1, BH15 and NRA3;
- Boreholes drilled during 2004 - BH18A, BH18B, BH19A, BH19B and BH19C, BH20A, BH20B, BH21A, BH21B, BH23 and BH24. Ammoniacal nitrogen concentrations for boreholes BH20A, BH20B, BH21A and BH21B have been graphed separately as concentrations are higher than in other boreholes within this group; and
- Boreholes drilled during 2006 (BH27 to BH33) and 2012 (BH34 to BH36).

Table 4.1 Selected Groundwater Quality Data July to September 2014

Borehole	Ammoniacal Nitrogen (mg/l)			Chloride (mg/l)			Cadmium (mg/l)			Temperature (°C)		
	July	Aug	Sept	July	Aug	Sept	July	Aug	Sept	July	Aug	Sept
Upgradient of Areas 2 and 3												
BH1	5.58	0.76	n.m.	31.6	30.8	n.m.	-	-	n.m.	15.4	14.9	n.m.
BH15	0.38	<0.27	0.85	18.1	12.5	19.0	-	-	n.m.	14.7	13.8	14.1
BH24	<0.27	<0.27	<0.27	32.4	31.1	30.7	-	-	n.m.	11.4	11	11.3
Downgradient of Area 2 and Upgradient of Area 3												
BH27	170	171	173	271	259	264	-	-	n.m.	16.3	15.9	16.3
BH34	1.4	1.64	1.45	56.6	56.2	58.3	-	-	n.m.	12.5	12.8	12.5
BH35	30.4	36.8	46.4	151	153	169	-	-	n.m.	15.2	15.1	15.7
BH36	127	127	126	200	206	197	-	-	n.m.	14.7	14.8	15.6
NRA3	0.60	0.87	1.03	21.4	17.9	20.7	-	-	n.m.	13.4	13.5	13.7
Lateral to Groundwater Flow												
BH18A	<0.27	<0.27	<0.27	42.6	39.9	19.1	-	-	n.m.	11.8	12.8	12.5
BH18B	<0.27	1.31	0.87	45.2	43.4	43.3	-	-	n.m.	12.9	13.8	13.4
BH28	<0.27	<0.27	<0.27	27.5	31.2	30.8	-	-	n.m.	10.7	10.8	11.2
BH29	1.46	1.54	2.36	26.1	23.6	24.0	-	-	n.m.	10.7	10.7	11.04
BH32	<0.27	<0.27	<0.27	17.5	17.6	19.7	-	-	n.m.	12.5	12.7	12.9
BH33	<0.27	<0.27	<0.27	14.6	15.4	14.5	-	-	n.m.	11.9	12.4	12.8

Table 4.1 (continued) Selected Groundwater Quality Data July to September 2014

Borehole	Ammoniacal Nitrogen (mg/l)			Chloride (mg/l)			Cadmium(mg/l)			Temperature (°C)		
	July	Aug	Sept	July	Aug	Sept	July	Aug	Sept	July	Aug	Sept
Downgradient of Areas 2 and 3												
BH19A	0.83	3.55	2.38	48	46	35	-	-	<0.0006	11.8	12.4	11.7
BH19B	<0.27	<0.27	0.34	37	149	163	-	-	<0.0006	11.3	11.6	11.6
BH19C	<0.27	2.55	4.78	77	144	173	-	-	<0.0006	11.8	12.7	12.9
BH20A	71	75	74	425	441	439	-	-	0.0006	12.9	12.2	11.9
BH20B	217	217	207	349	369	378	-	-	<0.0006	12.8	13.0	11.7
BH21A	50	36	27	209	160	119	-	-	0.0006	11.0	11.3	10.6
BH21B	66	33	51	56	80	98	-	-	<0.0006	11.2	10.7	10.7
BH23	<0.27	<0.27	<0.27	16	18	18	-	-	n.m.	10.9	10.9	11.5
BH30	206	199	187	274	279	285	-	-	n.m.	17.2	17.6	17.7
BH31	76.9	77.5	79.0	65.8	66	63.6	-	-	n.m.	14.4	13.3	13.3

Notes: Monthly monitoring for ammoniacal-nitrogen, chloride and temperature and quarterly monitoring for cadmium.
n.m.- not measured

4.2 Upgradient Boreholes

Boreholes BH1, BH15 and BH24 are upgradient of Areas 2 and 3 and provide an indication of background groundwater quality. Boreholes BH27, BH34 to BH36 and NRA3 are downgradient of Area 2 and upgradient of Area 3 and provide an indication of potential impact from Area 2 (see Figure 1). Data for ammoniacal nitrogen, chloride and cadmium at the upgradient boreholes for the latest quarter show that (see Table 4.1):

- Local background groundwater quality (BH1, BH15 and BH24):
  - Ammoniacal nitrogen concentrations continue to be below the laboratory detection limit (0.27 mg/l) except for isolated peaks which are consistent with previous data. The peak of 5.58 mg/l recorded at BH1 in July 2014 appears to be anomalous as subsequent data show concentrations of 0.76 mg/l;
  - Chloride concentrations continue to be low and broadly consistent with previous measurements. Borehole BH15 continues to show lower concentrations than boreholes BH1 and BH24;
- Groundwater quality downgradient of Area 2 and upgradient of Area 3 (BH27, BH34 to BH36 and NRA3):
  - Concentrations of ammoniacal nitrogen and chloride continue to be above local background concentrations at boreholes BH27, BH35 and BH36 within the central part of the downgradient boundary of Area 2. The most elevated concentrations continue to be at BH27 and represent migration of contaminated groundwater from Area 2;
  - Chloride concentrations showed little variability and remained within the range of concentrations measured previously; and
  - Ammoniacal nitrogen concentrations continue to show increasing concentrations southwards towards borehole BH27.

4.3 Boreholes Situated Lateral to the Groundwater Flow Direction

Boreholes BH18A and BH18B, BH28, BH29, BH32 and BH33 are situated lateral to the groundwater flow direction (see Figure 1). Data for ammoniacal nitrogen, chloride and cadmium at these boreholes for the latest quarter show that (see Table 4.1):

- Concentrations continue to be generally consistent with the results of previous monitoring;
- There is little or no evidence of contamination (time-series plots in Appendix C) except for the slightly elevated-above-baseline chloride concentrations (39-95 mg/l in BH18A and 40-82 mg/l in BH18B above typical baseline of about 25 mg/l) which continue to be measured in boreholes BH18A and BH18B. These are associated with leaching from marine dredgings used as part of the engineered cap to Area 2 (dredgings produced a saline runoff during wet periods, with the discharge to the surface water lagoon resulting in an impact on groundwater quality as measured in the nearby boreholes BH18A and BH18B);

- Ammoniacal-nitrogen concentrations continue to be within local background levels except for BH29, on the southern edge of Area 3, which continues to show slightly higher concentrations consistent with historical data. Concentrations at BH18B increased from below detection limit to 0.87-1.31 mg/l but remained within the historical range (<0.3-3.44 mg/l excluding isolated peaks 12.9 mg/l and 7.79 mg/l).

4.4 Downgradient Boreholes

Boreholes BH19 (A, B and C), BH20 (A and B), BH21 (A and B), BH30 and BH31 are downgradient of Areas 2 and 3. Data for ammoniacal nitrogen, chloride and cadmium at these boreholes for the latest quarter show that (see Table 4.1):

- All of the boreholes downgradient of Areas 2 and 3 are contaminated to some degree by leachate from the unlined Area 2 landfill (time-series plots in Appendix C). BH27, located on the downgradient edge of Area 2 upgradient of Area 3, recorded the highest contaminant concentrations up to 2013 and provides evidence of this continuing impact on groundwater from Area 2. BH20A and BH20B, located within the central part of the downgradient boundary of Area 3, recorded the highest concentrations since 2014 indicating downgradient movement of the leachate plume from Area 2;
- The trigger levels (Table 4.2) for ammoniacal-nitrogen and chloride specified in the EP (ref GP3330BY) for Area 1 and 3 were exceeded as follows (monthly reporting):
  - BH19A – chloride trigger level (29 mg/l) in July (48 mg/l), August (46 mg/l) and September (35 mg/l);
  - BH19B – chloride trigger level (28 mg/l) in July (37 mg/l), August (149 mg/l) and September (163 mg/l);
  - BH19C – ammoniacal-nitrogen trigger level (3 mg/l) in September (4.78 mg/l). Chloride trigger level (30 mg/l) in July (77 mg/l), August (144 mg/l) and September (173 mg/l);
  - BH20A – ammoniacal-nitrogen trigger level (5 mg/l) in July (71 mg/l), August (75 mg/l) and September (74 mg/l). Chloride trigger level (310 mg/l) in July (425 mg/l), August (441 mg/l) and September (439 mg/l); and
  - BH21A – ammoniacal-nitrogen trigger level (5.1 mg/l) in July (50 mg/l), August (36 mg/l) and September (27 mg/l).
- Cadmium concentrations continue to be below the trigger level (5.5 µg/l) specified in the EP for Area 2 and Civic Amenity (ref PP3294FJ) and for Areas 1 and 3 (ref GP3330BY)

Compliance with the trigger levels (Table 4.2) specified in the EP (ref PP3294FJ) for Area 2 and Civic Amenity is reported on a 6-monthly basis and falls outside this quarterly monitoring period;

The Groundwater Contingency Action Plan for the site (AMEC report reference: 04602N1857) details measures to be taken in the event that trigger levels are exceeded. Notices of the EP trigger levels exceedances were provided to the NRW by the submission of Schedule 6

notifications. Copies of these are included in Appendix E. These exceedances reflect variability in the data associated with contaminant migration from the unlined landfill Area 2 as discussed below:

- EP trigger levels for chloride continue to be exceeded at boreholes BH19A, BH19B and BH19C (EP ref GP3330BY), in the northwest corner of Area 3, which monitor the sand aquifer at different depths. These elevated concentrations, above typical baseline values and the EP trigger levels, reflect the downgradient migration of a leachate plume derived from the unlined Area 2. Review of the monitoring data for this quarter indicates that:
  - Chloride and ammoniacal-nitrogen concentrations at the shallowest installation BH19C increased to 173 mg/l and 4.78 mg/l, respectively, in exceedance of the EP trigger levels (30 mg/l and 3 mg/l, respectively, EP ref GP3330BY);
  - Chloride concentrations at the mid-depth installation BH19B increased to 163 mg/l exceeding the EP trigger level (28 mg/l in EP ref GP3330BY) but remaining within the historical range 16-227 mg/l. Ammoniacal-nitrogen concentrations continued to be low (<0.27-0.34 mg/l); and
  - Chloride concentrations at the deepest installation BH19A (35-48 mg/l) continue to exceeded the trigger level (29 mg/l in EP ref GP3330BY and typical baseline (about 15 mg/l). Ammoniacal-nitrogen concentrations at this borehole remained below the trigger level (3.6 mg/l ref GP3330BY) but continued to exceed typical baseline values (<0.3 mg/l);
- Ammoniacal-nitrogen (71-75 mg/l) and chloride (425-441 mg/l) concentrations at BH20A continue to be elevated and exceeding the trigger levels (5.0 mg/l and 310 mg/l, respectively in EP ref GP3330BY). Historical data show an upward trend in concentrations since the end of 2012 which is associated with the downgradient migration of a leachate plume originating from Area 2;
- Ammoniacal-nitrogen concentrations (27-50 mg/l) exceeding the trigger level 5.1 mg/l in EP ref GP3330BY) and chloride concentrations (119-209 mg/l) at BH21A continue to be elevated and reflect the downgradient migration of a leachate plume originating from Area 2.

Table 4.2 EP Trigger Levels for Groundwater Quality

Borehole	EP (ref PP3294FJ) Trigger Levels for Area 2 and Civic Amenity			EP (ref GP3330BY) Trigger Levels for Areas 1 & 3		
	Chloride (mg/l)	Ammoniacal Nitrogen (mg/l)	Cadmium (µg/l)	Chloride (mg/l)	Ammoniacal Nitrogen (mg/l)	Cadmium (µg/l)
Reporting Frequency	**6 Monthly**	**6 Monthly**	**6 Monthly**	**Monthly**	**Monthly**	**Quarterly**
BH19A	250	3.6	5.5	29	3.6	5.5
BH19B	34	3.0	5.5	28	3.0	5.5
BH19C	34	3.0	5.5	30	3.0	5.5
BH20A	504	5.0	5.5	310	5.0	5.5
BH20B	504	230	5.5	424	230	5.5
BH21A	387	266	5.5	270	5.10	5.5
BH21B	215	69.7	5.5	411	69.7	5.5
BH29	19.8	19.8	5.5	-	-	-
BH30	504	266	5.5	-	-	-
BH31	179	102	5.5	-	-	-

Overall, the leachate plume derived from Area 2 is having an impact on groundwater quality downgradient of Areas 2 and 3. The development of the site, including capping and associated drainage of completed areas and engineering of new cells in Area 3, is likely to also be affecting groundwater quality. However, the overall effect on groundwater quality is expected to be a continued improvement, particularly due to the capping of Area 2. This is likely to be due to a combination of the following:

- Reduced leachate generation due to restricted infiltration;
- Reduction in leachate concentration as a result of waste stabilisation; and
- Dilution by groundwater migrating beneath the landfill from the east.

Leachate and groundwater quality will continue to be monitored. The Contingency Action Plan for the site (Table 4.1 in Closure Report, May 2007) identifies a number of actions subject to the number of exceedances of groundwater control and trigger limits, including review of monitoring information, review of conceptual model assumptions and review of existing control and trigger limits.

4.5 Temperature Measurements

Temperature measurements for this quarter are consistent with seasonal trends, recording summer highs in all monitoring locations (Appendix C). There is no major variability in

temperature measurements between upgradient/lateral boreholes and downgradient boreholes with the following exceptions:

- Borehole BH27 (downgradient of Area 2 only), which has consistently recorded temperatures up to 5ºC higher than most of the other monitoring locations, possibly reflecting ongoing waste degradation activity in Area 2 of the landfill;
- Borehole BH30, on the western edge of Area 3, which also records temperatures 3-6°C higher than most other locations. This borehole is downgradient of borehole BH27; and
- Boreholes BH35 and BH36 (downgradient of Area 2 only), the more southerly of the boreholes on the downgradient edge of Area 2, have continued to record temperatures that are slightly higher than most other locations (except boreholes BH27 and BH30.

5. Surface Water Quality

Surface water monitoring is a requirement of the EP for Area 2 and 3 at monitoring locations SW1, SW2 and SW3 (Section 1.3). SW1 is located in the vicinity of the site's permitted discharge and SW2 and SW3 are located in the ditch to the west (downstream) of Area 3, as shown on Figure 1. As a consequence of some contamination identified in this part of the site in late 2010, in addition to the regular sampling at location SW1, samples are also taken whenever possible from the pipe which discharges to the drain near this point. The pipe discharges surface water runoff from hardstanding around the site buildings in Area 1 after it has passed through an oil water separator.

Analytical results for ammoniacal nitrogen, chloride, electrical conductivity (EC) and temperature in the last quarter are summarised in Table 5.1 and presented (excluding EC but including chemical oxygen demand (COD)) graphically combined with long term water quality data in Appendix F. The data for the latest quarter show that:

- SW1 and pipe adjacent to SW1 monitoring locations were dry;
- Ammoniacal nitrogen concentrations at SW2 increased from 3.71 mg/l in June to 6.4 mg/l in July (sampling point was dry in August and September). Chloride concentrations continued to show variability decreasing from 197 mg/l in June to 112 mg/l in July. These concentrations continue to be higher than the average concentrations measured previously of <0.3 mg/l ammoniacal-nitrogen (data for 2005 to 2012) and 23 mg/l chloride (data for 2005-2009). There are a number of possible explanations for the recent increased concentrations at SW2 which are under investigation including:
  - Storage of compost taken from the IVC maturation slab;
  - Muck spreading on adjacent agricultural land;
  - Groundwater baseflow contribution during periods of high groundwater levels (0.96-1.52 m bgl in February 2014 at upgradient boreholes BH18A and BH18B compared to perimeter ditch base elevation of about 1 to 1.5 m bgl): previous data (Section 4.3) indicated that groundwater quality in the northern part of the site (cross-gradient to the landfill) has been affected, particularly during 2011 to 2013, by the passage of a saline "slug" associated with runoff from the marine dredgings used as part of the engineered cap to Area 2. The elevated chloride peaks recorded at SW2 since 2012 are likely to reflect baseflow of saline groundwater (time-series charts in Appendix F). The occasional ammoniacal-nitrogen peaks in SW2 in 2013-2014 (24.6 mg/l in August 2013, 15.3 mg/l in December 2013 and 6.4 mg/l in July 2014) may be associated with desorption of ammoniacal-nitrogen from the sand aquifer by potassium (ion exchange) associated with the saline "slug";
- Ammoniacal nitrogen at SW3 increased from below detection limit (<0.27 mg/l) to 3.7 mg/l in July before falling again in August to 1.33 mg/l (sample point was dry in September). Chloride concentrations increased to 223 mg/l in August above the historical range (21.5-113 mg/l) but decreased to 149 mg/l in October;

- Temperature measurements are consistent with seasonal trends, recording summer highs in all monitoring locations where it was possible to collect a sample with little difference between the values measured across monitoring locations; and
- Observations of the state of the water at locations SW1 (Area 1 discharge) and SW3 (site discharge near sluice) are made on a weekly basis, as specified in Table S4.3 of the EP. Site records of these observations are included with the surface water quality plots in Appendix F.

Table 5.1 Summary of Surface Water Quality July to September 2014

Determinand	SW1			Pipe Adjacent to SW1			SW2			SW3		
	July	Aug	Sept	July	Aug	Sept	July	Aug	Sept	July	Aug	Sept
Ammoniacal Nitrogen (mg/ l)	dry	dry	dry	dry	dry	dry	6.4	dry	dry	3.7	1.33	dry
Chloride (mg/l)	dry	dry	dry	dry	dry	dry	112	dry	dry	49.1	223	dry
Electrical Conductivity (µS/cm)	dry	dry	dry	dry	dry	dry	846	dry	dry	682	1330	dry
Temperature (°C)	dry	dry	dry	dry	dry	dry	14.9	dry	dry	16.6	16.7	dry

6. Landfill Gas

6.1 Perimeter Gas Monitoring

Landfill gas monitoring in the perimeter boreholes is a requirement of the EP for Area 3 to identify any off site migration. Monitoring results for Boreholes BG01 to BG04 for the latest monitoring quarter are presented in Table 6.1 together with trigger limits for methane and carbon dioxide. These show levels consistent with previous monitoring and show no evidence of off-site landfill gas migration. None of the trigger limits were exceeded during the monitoring period.

Table 6.1 Results of Perimeter Landfill Gas Monitoring July to September 2014

Date	BHG01			BHG02			BHG03			BHG04		
	CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)	CH4 (%v/v)	CO2 (%v/v)	O2 (%v/v)
31/07/2014	0.5	0.4	21.2	0.5	0.4	21.3	0.5	0.1	21.6	0.5	0.1	21.6
14/08/2014	0.1	0.5	20.5	0.1	0.6	20.5	0.1	2.6	18.7	0.1	0.1	20.9
15/09/2014	0	0	20.8	0	0.3	20.6	0	1.9	19.3	0	0.1	20.7
Trigger Limits	*1*	*1.5*	*-*	*1*	*1.6*	*-*	*1*	*5.1*	*-*	*14.8*	*11.1*	*-*

6.2 In-Waste Gas Monitoring (Area 3)

Gas monitoring has also been carried out within Area 3 in accordance with the site EP. Monitoring during this reporting period was from combined leachate and gas monitoring wells (LM1/1 and LM1/2 in Cell 1, LM2/1 and LM2/2 in Cell 2 and LM3/1 in Cell 3, LM4/2 in Cell4A, leachate manholes (LCP1, LCP2, LCP3, LCP4A and LCP4B in Cells 1, 2, 3, 4A and 4B, respectively) and gas wells (C11 to C14 in Cell 1, C21 to C25 in Cell 2, C31 to C36 in Cell 3, C41 to C46 in Cell 4A and C51 to C57 in Cell 4B).

The results of the gas monitoring undertaken during the latest monitoring period are presented in Tables 6.2 to 6.5. The data show that wastes in Cells 1, 2, 3 and 4 are continuing to produce landfill gas with methane and carbon dioxide concentrations recently up to 67.3% v/v and 28.2% v/v respectively in Cell 1, 64.2% v/v and 37.7% v/v respectively in Cell 2, 64.0% v/v and 40.8% v/v respectively in Cell 3, 62.7% v/v and 41.4% v/v respectively in Cell 4A and 62.5% v/v and 42.6% v/v respectively in Cell 4B. Concentrations were generally within historical ranges for all locations and parameters.

Table 6.2 Cell 1 In-Waste Landfill Gas Monitoring Results July to September 2014

Date	AP (mb)	LM1/1				LM1/2				LCP1			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1018 – 1021	38.4	28.2	0.1	1.0	0.1	7.8	11.7	0	67.3	25.3	0.1	0
13/08/2014	1008 - 1013	38.7	27.5	0	2.0	17.4	21.5	0.2	10.0	24.7	17.4	0.7	1.0
18/09/2014	1013 - 1015	3.7	15.4	2.9	6.0	0	3.7	16	1.0	17.4	17.3	0.7	3.0

Date	AP (mb)	C11				C12				C13				C14			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1021 – 1022	34.3	18.9	0	5.0	40.0	20.7	0	5.0	46.9	25.8	0	4.0	13.7	18.3	0.6	8.0
13/08/2014	1007 – 1009	31.6	23.0	0	6.0	20.4	21.3	0	6.0	42.7	27.3	0.1	6.0	18.7	22.5	0.5	8.0
18/09/2014	1010 – 1013	20.1	21.0	0.1	6.0	12.6	19.2	0	8.0	22.9	21.6	0.1	8.0	14.2	16.2	4.5	7.0

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm.

Table 6.3 Cell 2 In-Waste Landfill Gas Monitoring Results July to September 2014

Date	AP (mb)	LM2/1				LM2/2				LCP2				C21			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1020 – 1022	64.2	37.7	0	10.0	33.9	28.4	0	4.0	58.7	37.1	0.7	6.0	54.6	33.5	0.1	6.0
13/08/2014	1006 - 1007	45.2	33.9	0	5.0	46.3	33.1	0	6.0	55.8	36.0	0.9	4.0	35.9	29.6	0.1	6.0
18/09/2014	1009 - 1017	60.9	37.0	0.1	12.0	12.8	20.7	0.8	6.0	42.9	31.6	0.9	9.0	25.0	25.2	0.1	9.0
Date	**AP (mb)**	**C22**				**C23**				**C24**				**C25**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1018 - 2022	48.5	33.6	1.3	5.0	56.9	37.1	0	15	45.8	28.2	5.4	3.0	60.1	35.9	0	6.0
13/08/2014	1006 - 1011	38.6	31.5	1.4	3.0	50.0	35.6	0	13	41.5	26.4	6.6	7.0	55.4	36.0	0	8.0
18/09/2014	1009 - 1017	33.8	26.6	1.7	7.0	47.5	33.3	0.1	21	34.6	22.4	8.0	6.0	29.5	27.1	0.2	11.0

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm

Table 6.4 Cell 3 In-Waste Landfill Gas Monitoring Results July to September 2014

Date	AP (mb)	LM3/1				LCP3				C31				C32			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1021 - 1022	7.5	18.6	1.3	2.0	37.9	26.8	6.2	1.0	50.9	36.6	0	25	2.7	4.6	15.7	12.0
13/08/2014	1006 - 1008	62.5	40.8	0	10.0	54.2	36.2	1.7	1.0	61.6	39.2	0	23	23.1	19.1	8.8	9.0
18/09/2014	1012 - 1014	56.5	39.4	0.2	8.0	54.2	36.2	1.5	4.0	45.0	34.5	0.1	29	5.4	4.0	15.9	9.0
Date	**AP (mb)**	**C33**				**C34**				**C35**				**C36**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1020 - 1039	30.1	28.5	0.2	6.0	61.6	39.2	0	45	42.9	31.8	0.2	6.0	24.2	26.2	0	2.0
13/08/2014	1006 - 1008	62.5	38.7	0	8.0	62.3	39.7	0	40	61.2	38.4	0.1	9.0	64.0	40.1	0	4.0
18/09/2014	1012 - 1019	43.4	34.0	0.2	9.0	55.7	37.9	0	61	44.8	33.9	0.3	12.0	40.7	34.0	0.1	6.0

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm

Table 6.5 Cell 4A In-Waste Landfill Gas Monitoring Results July to September 2014

Date	AP (mb)	LM4/2				LCP4A				C41				C42			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1021-1025	60.4	40.5	0	12.0	60.7	40.1	0	19.0	61.9	39.7	0	22.0	62.7	39.3	0	17.0
13/08/2014	1007 - 1008	61.8	41.4	0	13.0	61.0	40.8	0	18.0	61.8	40.1	0	23.0	61.7	38.5	0	15
18/09/2014	1012 - 1013	58.6	39.6	0	21.0	58.3	39.9	0.1	26.0	58.7	38.8	0	34.0	60.2	37.8	0	24.0
Date	**AP (mb)**	**C43**				**C44**				**C45**				**C46**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1021 - 1025	62.5	39.7	0	21	60.6	40.1	0	20	61.3	40.3	0	26	61.3	40.1	0	50
13/08/2014	1007 - 1012	61.8	39.1	0.2	21	60.9	40.0	0	19	61.6	40.1	0	25	61.7	40.0	0	47
18/09/2014	1009 - 1012	59.2	37.8	0	29	58.1	38.9	0	29	59.4	39.0	0	36	n.m.	n.m.	n.m.	n.m.

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm
n.m.- not measured. Additional measurements for C41 in September (58.4% CH4, 39.3% CO2, 0% O2 and 66ppm CO) and C42 in August (62.1% CH4, 38.8% CO2, 0% O2 and 16ppm CO).

Table 6.6 Cell 4B In-Waste Landfill Gas Monitoring Results July to September 2014

Date	AP (mb)	LCP4B				C51				C52				C53			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1021- 1022	61.1	41.1	0	16	60.7	40.6	0	66	61.9	40.9	0	44	60.8	41.7	0	119
13/08/2014	1008-1009	59.5	40.3	0.4	15	61.2	41.0	0	68	61.1	41.2	0	33	61.6	41.4	0	97
18/09/2014	1012-1013	37.6	27.3	6.1	18	57.9	39.6	0	77	57.7	40.2	0	55	58.7	40.2	0	101
Date	**AP (mb)**	**C54**				**C55**				**C56**				**C57**			
		CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO	CH4	CO2	O2	CO
29/07/2014	1021- 1022	62.5	41.0	00	60	62.1	40.4	0	21	61.4	40.7	0	84	59.9	42.6	0	179
13/08/2014	1007-1009	61.1	41.4	0	41	62.0	40.1	0	22	61.7	40.6	0	89	59.9	41.5	0	155
18/09/2014	1012-1013	58.2	40.6	0	50	59.1	39.4	0	30	56.9	38.4	0.1	100	57.7	40.1	0	145

Notes: AP- Atmospheric Pressure.
CH4, CO2 and O2 in %v/v and CO in ppm
n.m.- not measured.

7. Meteorological Data

Measurements of rainfall, temperature and wind speed are recorded daily at Ffridd Rasus. Monitoring data for the months July, August and September 2014 are presented in Appendix H.

8. Summary

The results of environmental monitoring carried out during the period July to September 2014 are broadly consistent with the results of previous monitoring; however there continues to be some variability in the data obtained.

The latest results can be summarised as follows:

- Leachate levels in Cells 1, 2, 3, 4A and 4B of Area 3 have been controlled below the leachate head limit of 1.5 m, with leachate extraction carried out as necessary;
- All of the groundwater boreholes recorded decreasing levels as a result of low recharge over the monitoring period;
- Leachate monitoring points in Area 2 continued to be dry during this quarter. Chloride and ammoniacal-nitrogen concentrations in leachate from Area 3 remained within the range of previous data except for ammoniacal-nitrogen in Cell 4A which exceeded the previous maximum. This is consistent with Cell 4A having the most recently deposited waste;
- Downgradient groundwater monitoring boreholes continue to indicate contamination by leachate from the unlined Area 2 landfill. Chloride and ammoniacal-nitrogen concentrations in the downgradient edge of Area 2 generally increase southwards towards BH27. Concentrations at the downgradient edge of Area 3 continue to be elevated which reflect the downgradient migration of the leachate plume derived from the unlined Area 2;
- The groundwater quality trigger levels specified in the EP (ref GP3330BY) for Area 1 and 3 were exceeded for chloride in BH19A, BH19B, BH19C and BH20A and for ammoniacal-nitrogen in BH19C, BH20A and BH21A. These exceedances reflect the downgradient migration of the leachate plume from the unlined Area 2;
- Chloride concentrations in boreholes BH18A and BH18B continued to exceed the typical baseline water quality (about 25 mg/l) and are attributed to a "slug" of saline water from the surface water lagoon migrating westwards. Over time this effect is diminishing as chloride is dispersed and diluted;
- SW1 (Area 1 permitted discharge) and pipe adjacent to SW1 monitoring locations were dry;
- Ammoniacal-nitrogen and chloride concentrations at SW2 (ditch flowing south along downstream boundary of Area 3) continued to be above the range measured previously. Possible reasons for the increased levels are under investigation and include muck spreading on adjacent agricultural land and groundwater baseflow contribution;
- Ammoniacal-nitrogen and chloride concentrations at SW3 (ditch exiting the downstream boundary of Area 3) remained within the range recorded previously except for chloride which increased to 223 mg/l in August. Chloride concentrations decreased to 149 mg/l in October; and

- Gas monitoring boreholes show no evidence of off-site landfill gas migration. None of the trigger levels for methane or carbon dioxide have been exceeded in the perimeter monitoring boreholes during the monitoring period. Wastes in Area 3 are continuing to produce landfill gas with methane and carbon dioxide concentrations within historical ranges for all locations and parameters.

Figure

N

257400 257500 257600 257700 257800 257900 258000 258100 258200

334100 334000 333900 333800 333700 333600 333500 333400

Cell 4 Filling began May 2012

Cell 3 Capped

Cell 2 Capped

Cell 1 Capped

Area 2

Surface Water Lagoon

Workshop

Civic Amenity Site

Weighbridge

Weighbridge office

Pulveriser building site offices and/welfare facilities

Septic tank and soakaway

WC area

HARPOUND

Recycling Centre

Refuse Composting Facility

Tks

Track

Drain

Sluice

BH16 BH23 BH32 BH33 BH1 BH31 BH14 BH7 BH34 BH35 BH26 BH25 BH22 A&B BH17 BH8 BH9 BH36 BH30 BH12 BH27 BHG04 BH29 BHG01 BHG02 BHG03 BH28 BH15 BH24

19 A,B+C 18 A+B 20 A+B 21 A+B

SW1 SW2 SW3

LM4/1 LCP4/1 LM4/2 LCP4/2 LM3/1 LCP3 LM4/3 LM2/1 LM3/2 LCP2 LM1/1 LM2/2 LCP1 LM1/2 NRA2 NRA3

LW13 LW4A LW6A LW5A

C44 C45 C46 C43 C42 C41 C34 C33 C31 C35 C36 C23 C24 C25 C22 C13 C14 C21 C12 C11

BH1 BH2 BH3 BH5 BH10 BH4 BH8A BH6 BH7 BH17 BH18 BH19 BH11 BH12 BH13 BH16 BH15 BH14 BH21 BH22 BH23

BHG05 HARSMP05 HARSMP03 HARSMP01 HARSMP02 HAROLDGW HARSMP04

W10 W9 W3 W8 W7 W6 W5 W4 W2

GW1 GW3 GW5 GW7 GW4 GW6 GW8 GW9 GW11 GW10 GW12 GW13 GW14

Key

- Boundary of Area 1
- Boundary of Area 2 (area of site to be definitively closed)
- Boundary of Area 3
- Single installation borehole
- Double installation borehole
- Triple installation borehole
- Surface water monitoring point
- Leachate monitoring point
- Perimeter gas monitoring borehole (BHG01)
- Boreholes lost/destroyed
- Replacement monitoring boreholes (March 2012)
- Surface water flow direction
- Gas well

0 m 150 m

Scale 1:3000 @ A3

Gwynedd Council
Ffridd Rasus Landfill Quarterly Monitoring Report

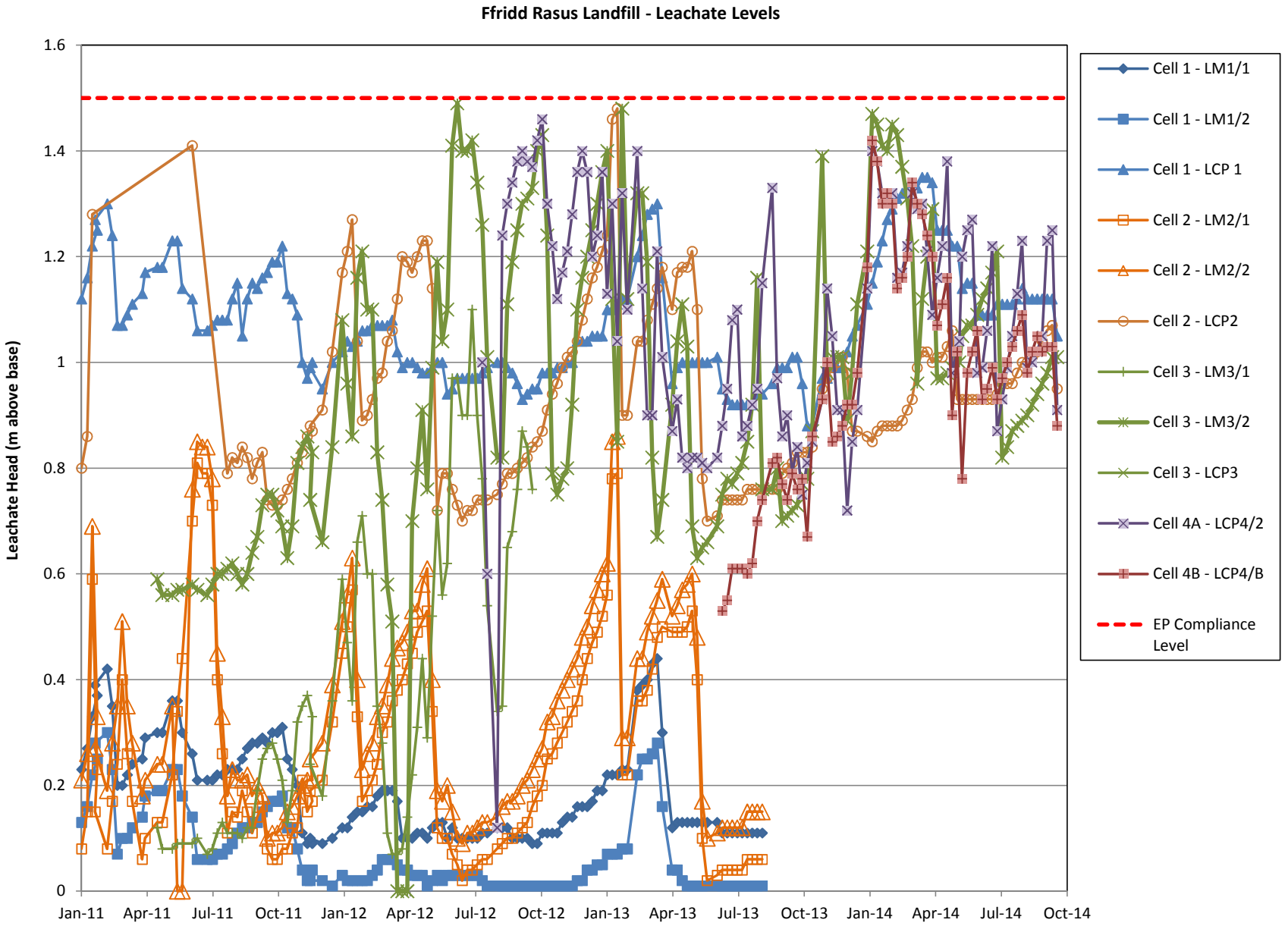
Figure 1
Monitoring Locations

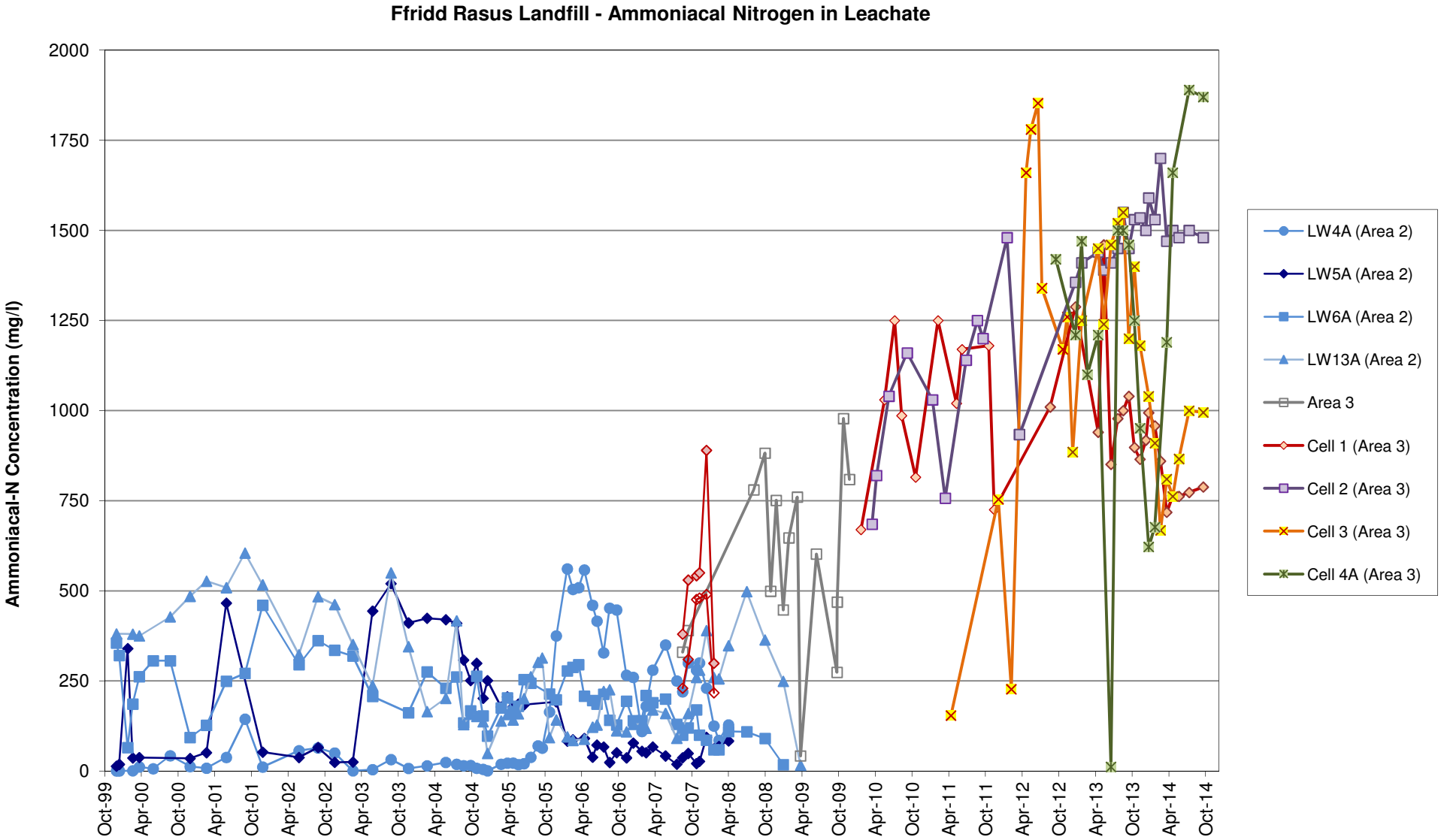
January 2015
28587-Shr326.dwg barkr

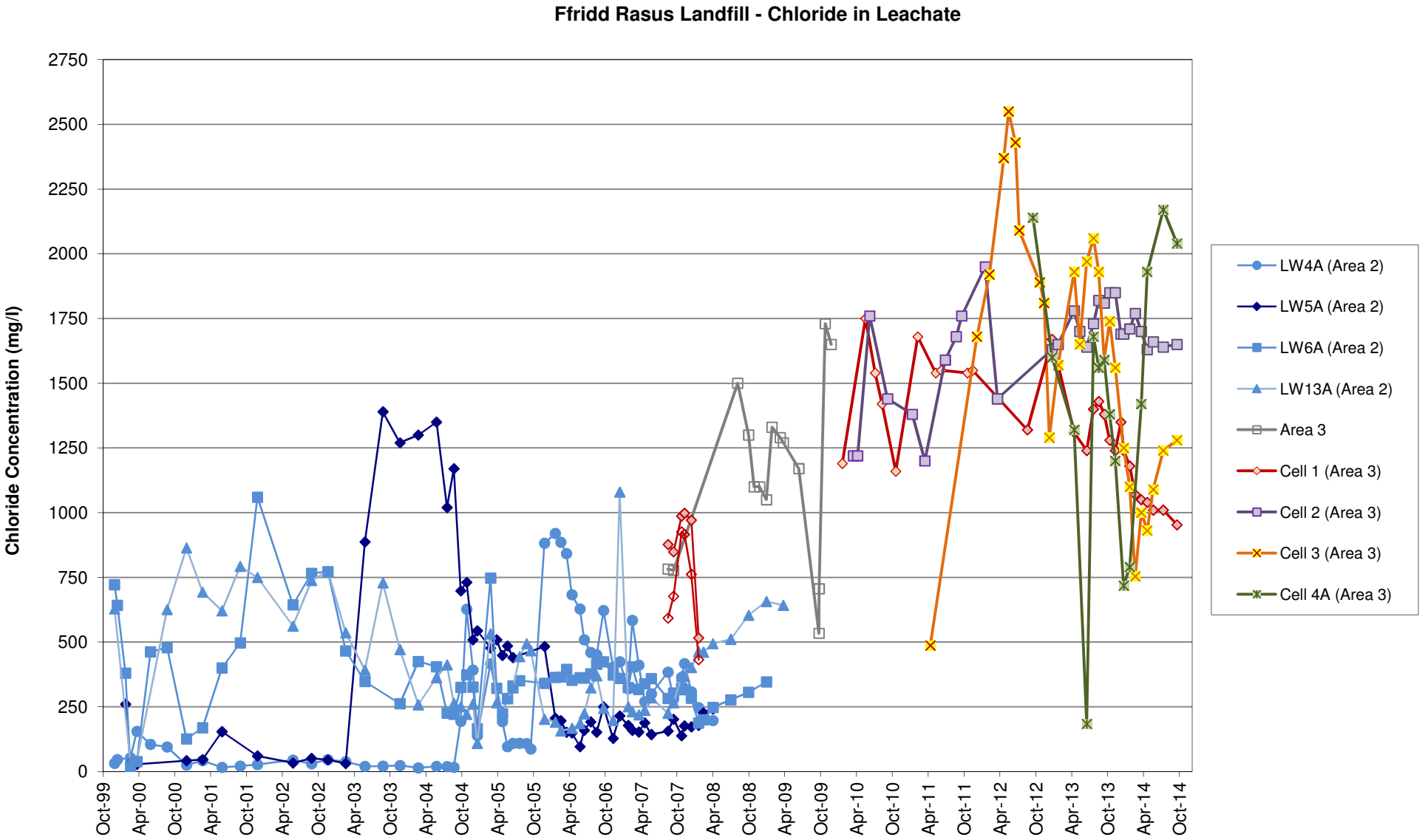
amec

Appendix A
Leachate Level and Quality Plots

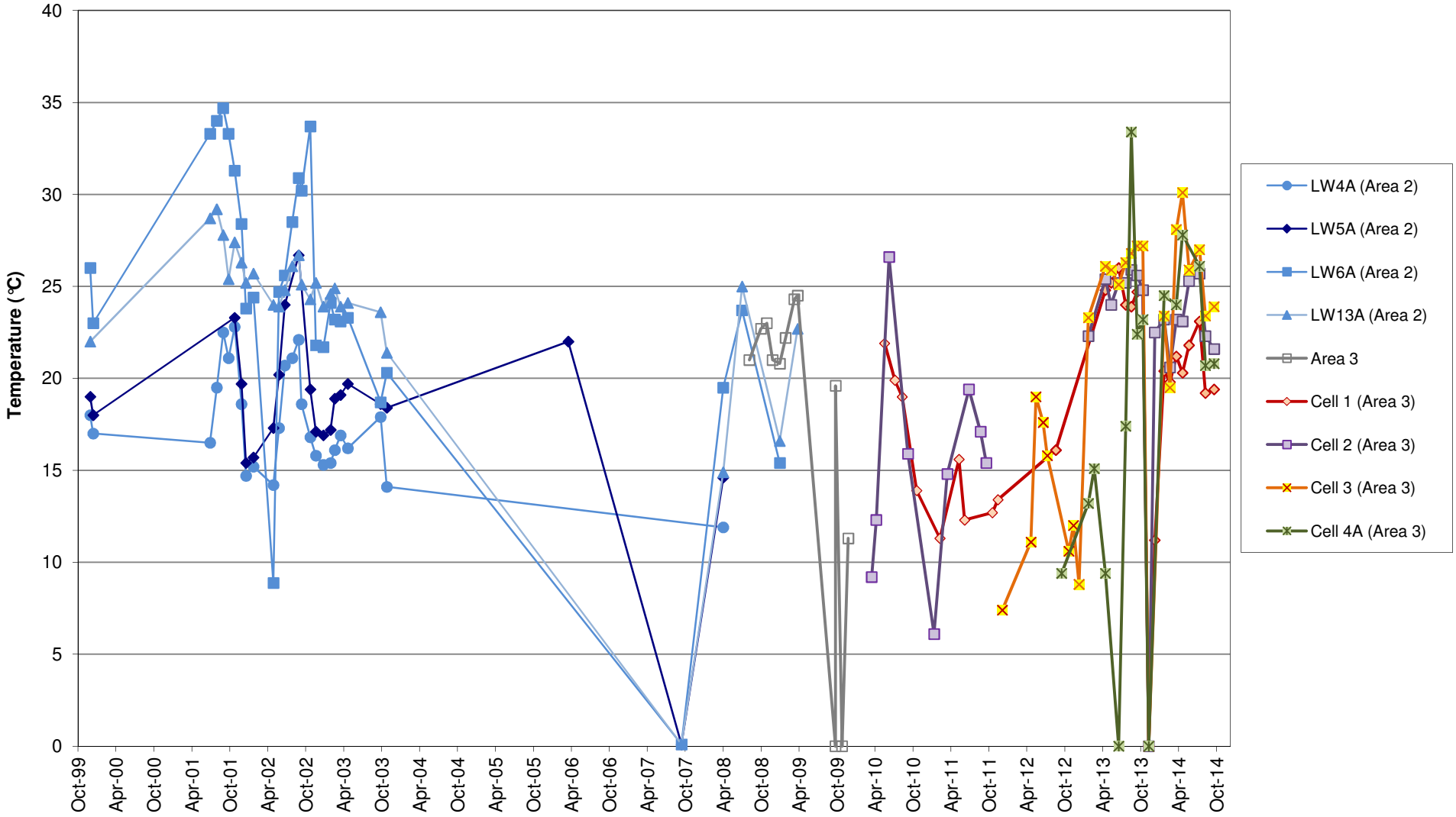
4 Pages


Ffridd Rasus Landfill - Leachate Levels
Leachate Head (m above base)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Cell 1 - LM1/1
Cell 1 - LM1/2
Cell 1 - LCP 1
Cell 2 - LM2/1
Cell 2 - LM2/2
Cell 2 - LCP2
Cell 3 - LM3/1
Cell 3 - LM3/2
Cell 3 - LCP3
Cell 4A - LCP4/2
Cell 4B - LCP4/B
EP Compliance Level


Ffridd Rasus Landfill - Ammoniacal Nitrogen in Leachate
Ammoniacal-N Concentration (mg/l)
2000
1750
1500
1250
1000
750
500
250
0
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Apr-07
Oct-07
Apr-08
Oct-08
Apr-09
Oct-09
Apr-10
Oct-10
Apr-11
Oct-11
Apr-12
Oct-12
Apr-13
Oct-13
Apr-14
Oct-14
LW4A (Area 2)
LW5A (Area 2)
LW6A (Area 2)
LW13A (Area 2)
Area 3
Cell 1 (Area 3)
Cell 2 (Area 3)
Cell 3 (Area 3)
Cell 4A (Area 3)


Ffridd Rasus Landfill - Chloride in Leachate
Chloride Concentration (mg/l)
2750
2500
2250
2000
1750
1500
1250
1000
750
500
250
0
Oct-99
Apr-00
Oct-00
Apr-01
Oct-01
Apr-02
Oct-02
Apr-03
Oct-03
Apr-04
Oct-04
Apr-05
Oct-05
Apr-06
Oct-06
Apr-07
Oct-07
Apr-08
Oct-08
Apr-09
Oct-09
Apr-10
Oct-10
Apr-11
Oct-11
Apr-12
Oct-12
Apr-13
Oct-13
Apr-14
Oct-14
LW4A (Area 2)
LW5A (Area 2)
LW6A (Area 2)
LW13A (Area 2)
Area 3
Cell 1 (Area 3)
Cell 2 (Area 3)
Cell 3 (Area 3)
Cell 4A (Area 3)

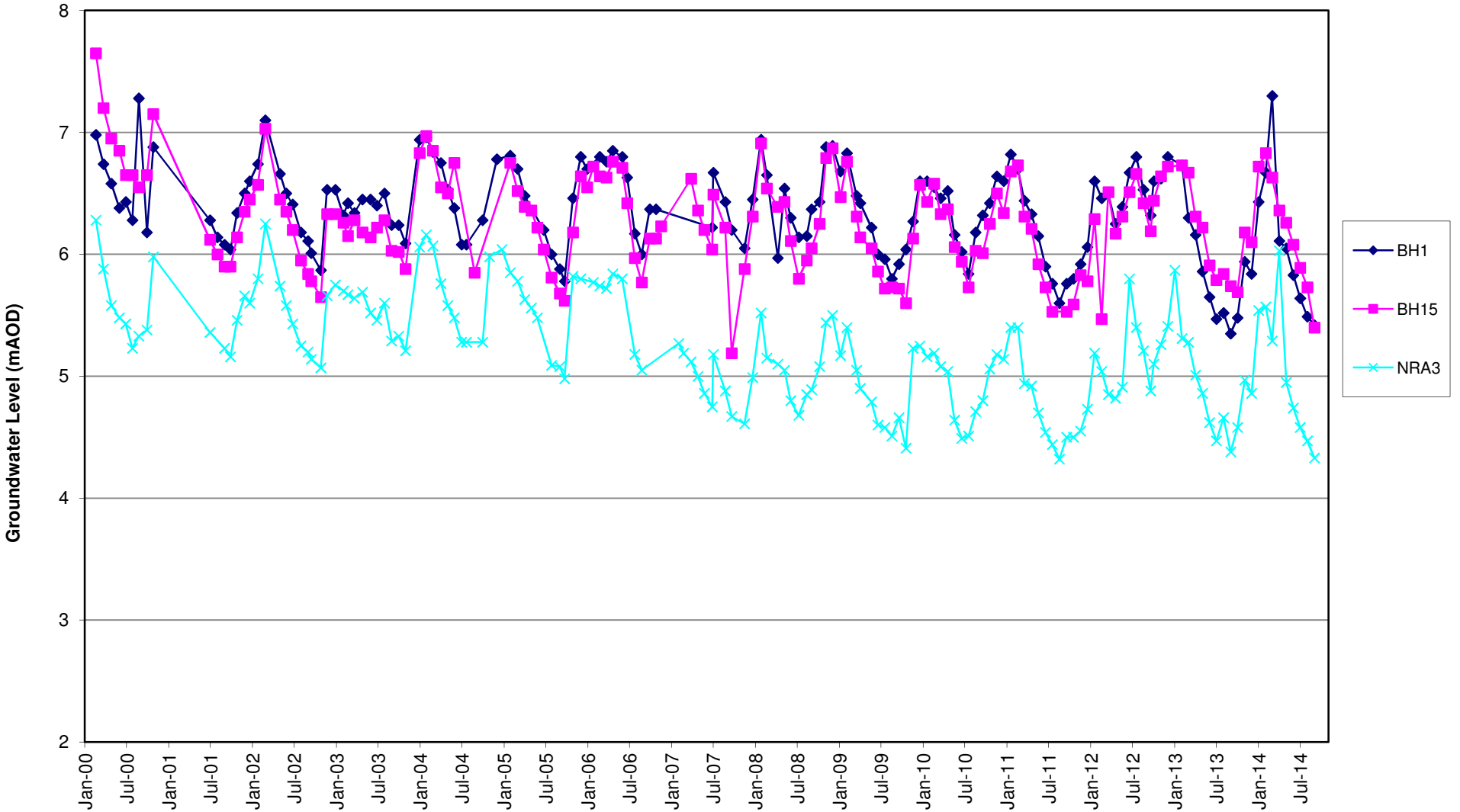
Ffridd Rasus Landfill - Leachate Temperature



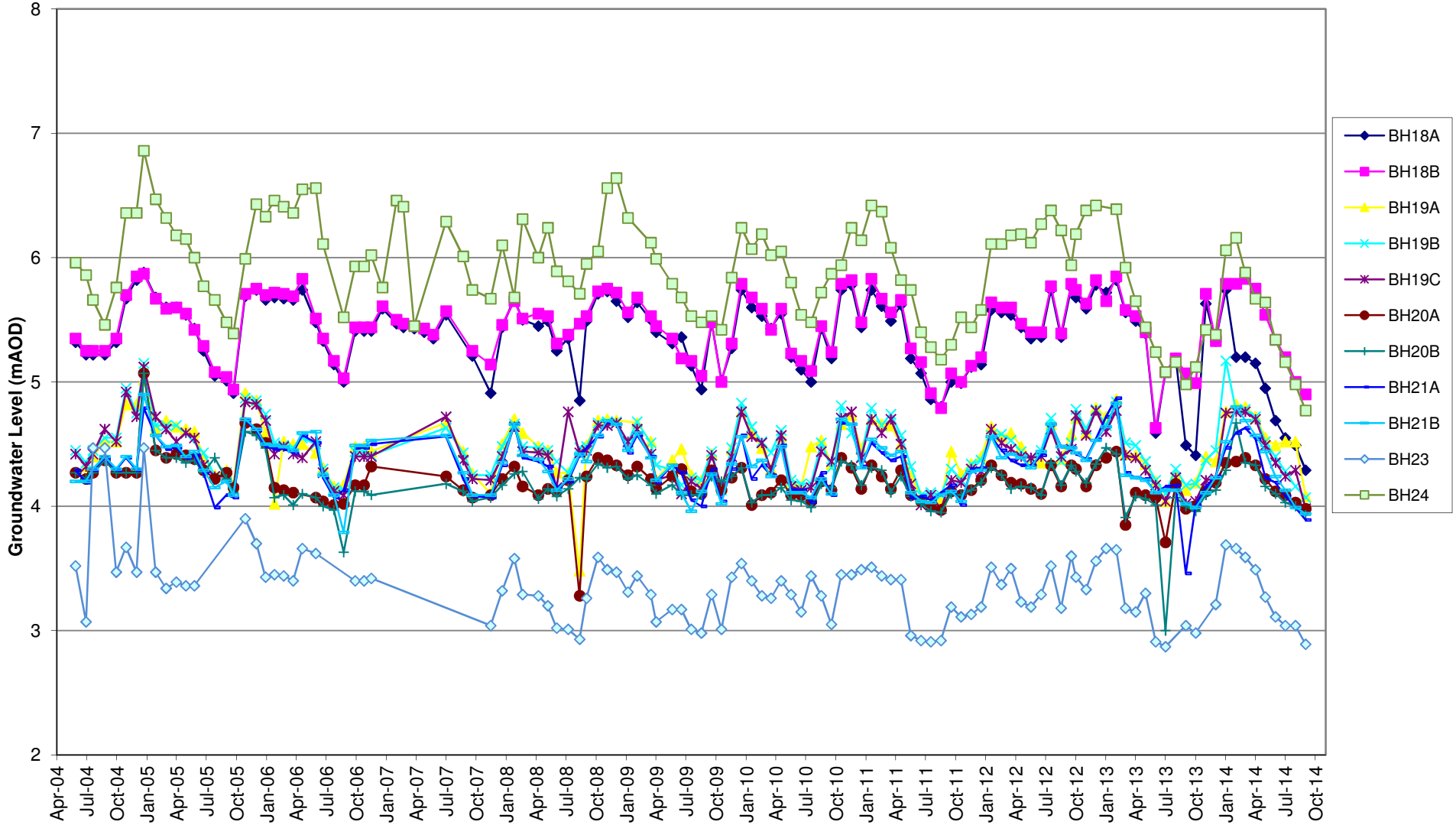
Appendix B
Groundwater Level Plots

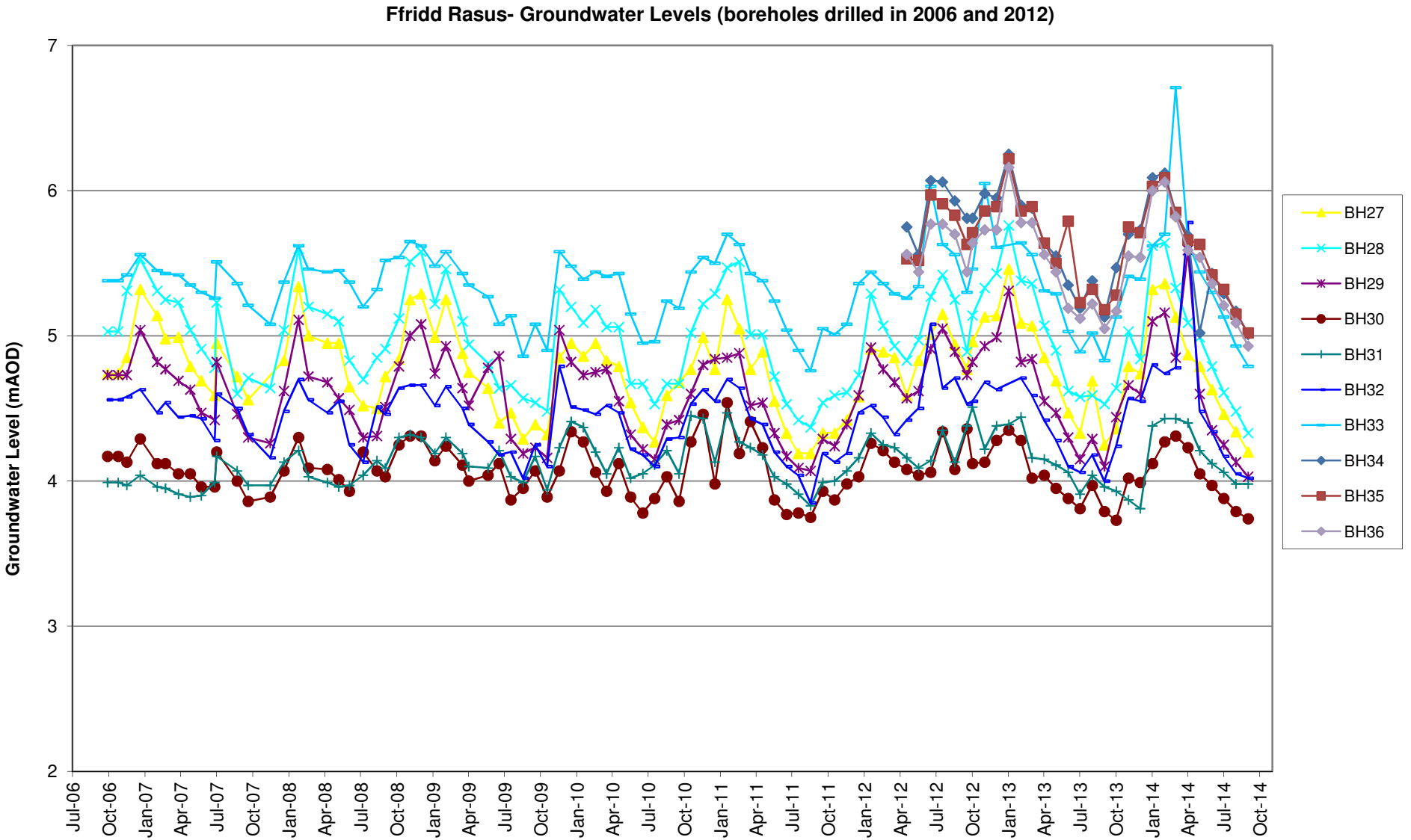
3 Pages

Ffridd Rasus Landfill - Groundwater Levels (boreholes drilled pre-2004)



Ffridd Rasus Landfill - Groundwater Levels (boreholes drilled in 2004)

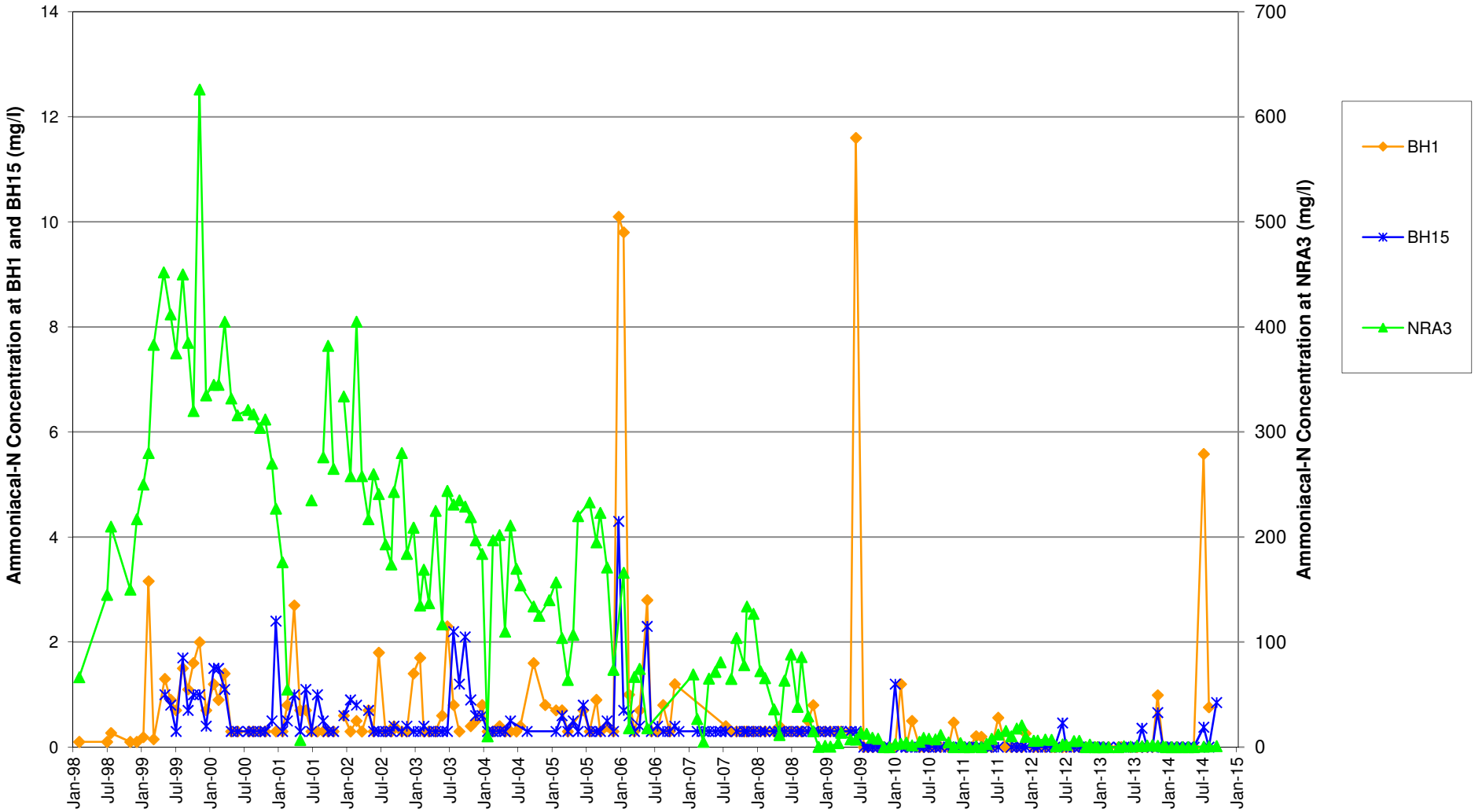


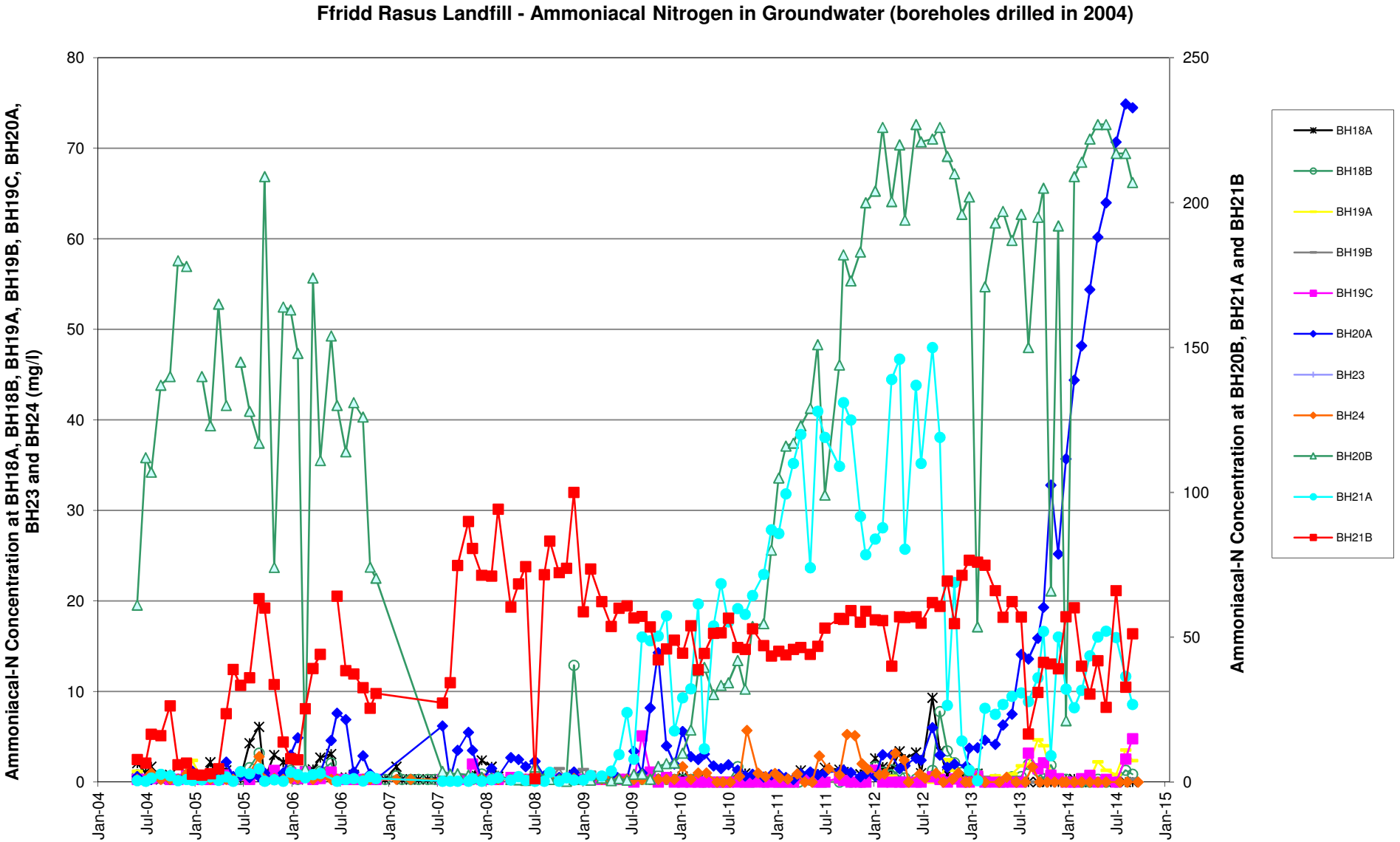

Ffridd Rasus- Groundwater Levels (boreholes drilled in 2006 and 2012)
Groundwater Level (mAOD)
7
6
5
4
3
2
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
BH27
BH28
BH29
BH30
BH31
BH32
BH33
BH34
BH35
BH36

Appendix C
Groundwater Quality Plots

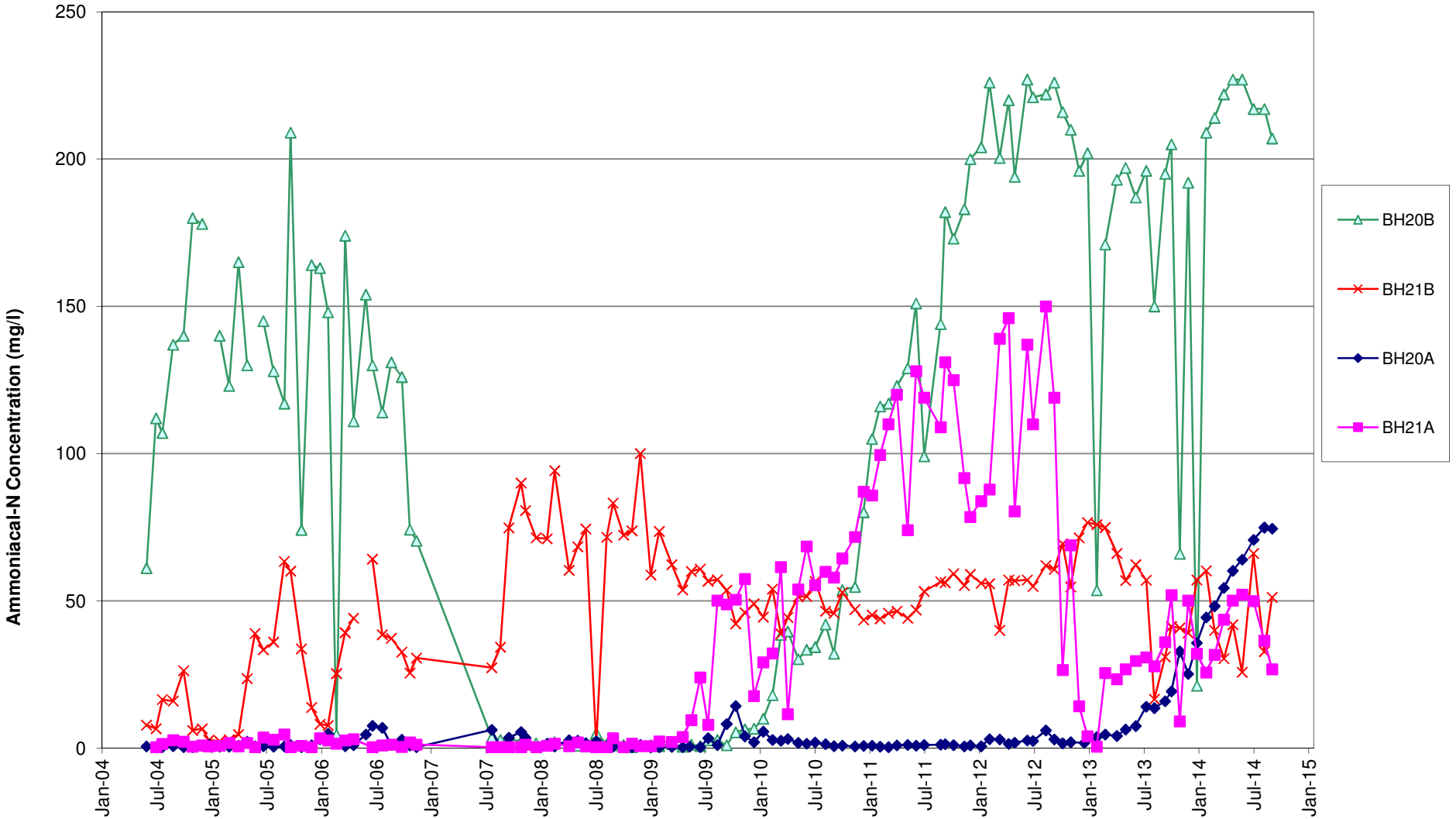
12 Pages

Ffridd Rasus Landfill - Ammoniacal Nitrogen in Groundwater (Boreholes drilled pre-2004)

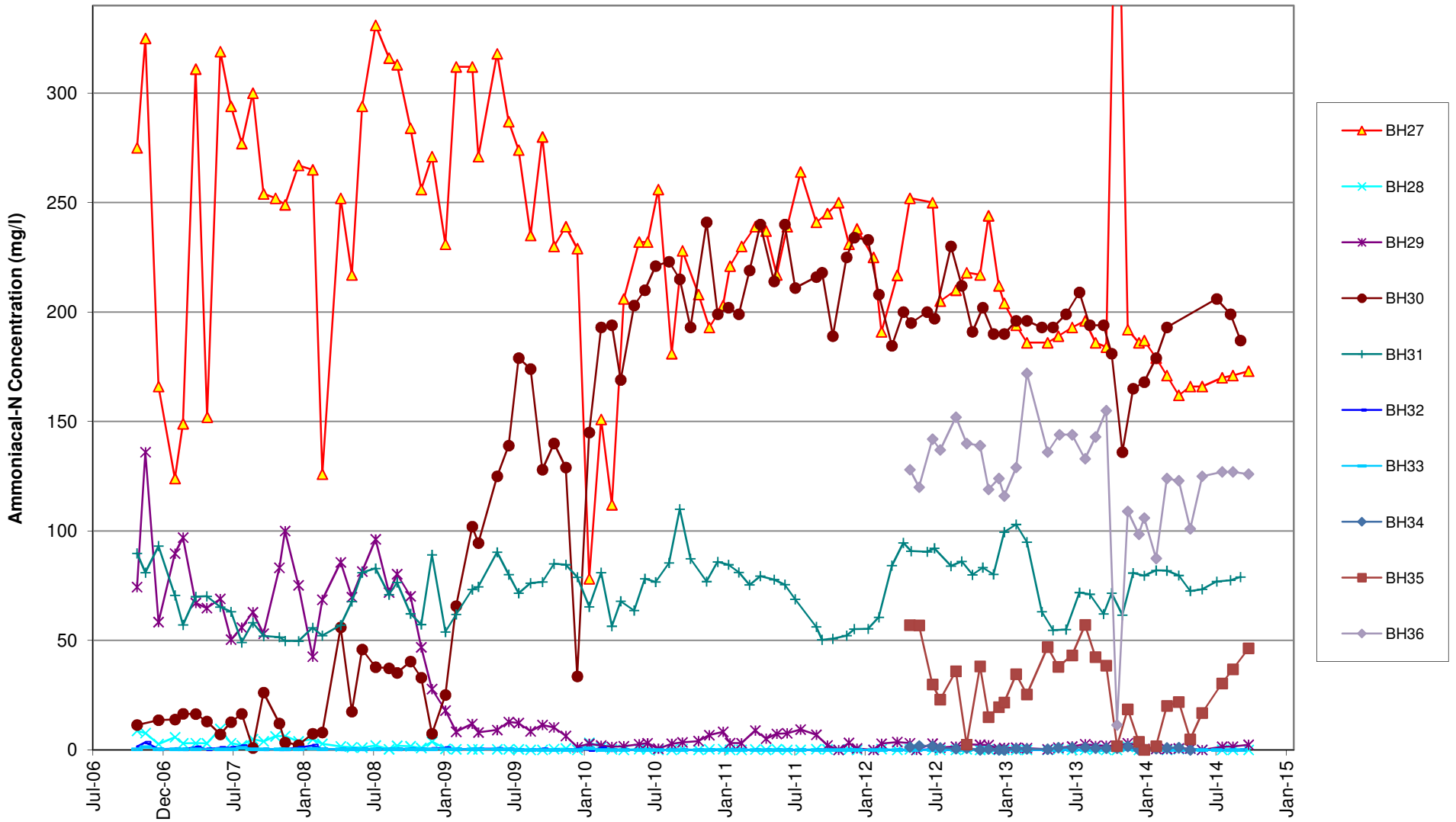



Ffridd Rasus Landfill - Ammoniacal Nitrogen in Groundwater (boreholes drilled in 2004)
Ammoniacal-N Concentration at BH18A, BH18B, BH19A, BH19B, BH19C, BH20A, BH23 and BH24 (mg/l)
Ammoniacal-N Concentration at BH20B, BH21A and BH21B
0
10
20
30
40
50
60
70
80
0
50
100
150
200
250
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
BH18A
BH18B
BH19A
BH19B
BH19C
BH20A
BH23
BH24
BH20B
BH21A
BH21B

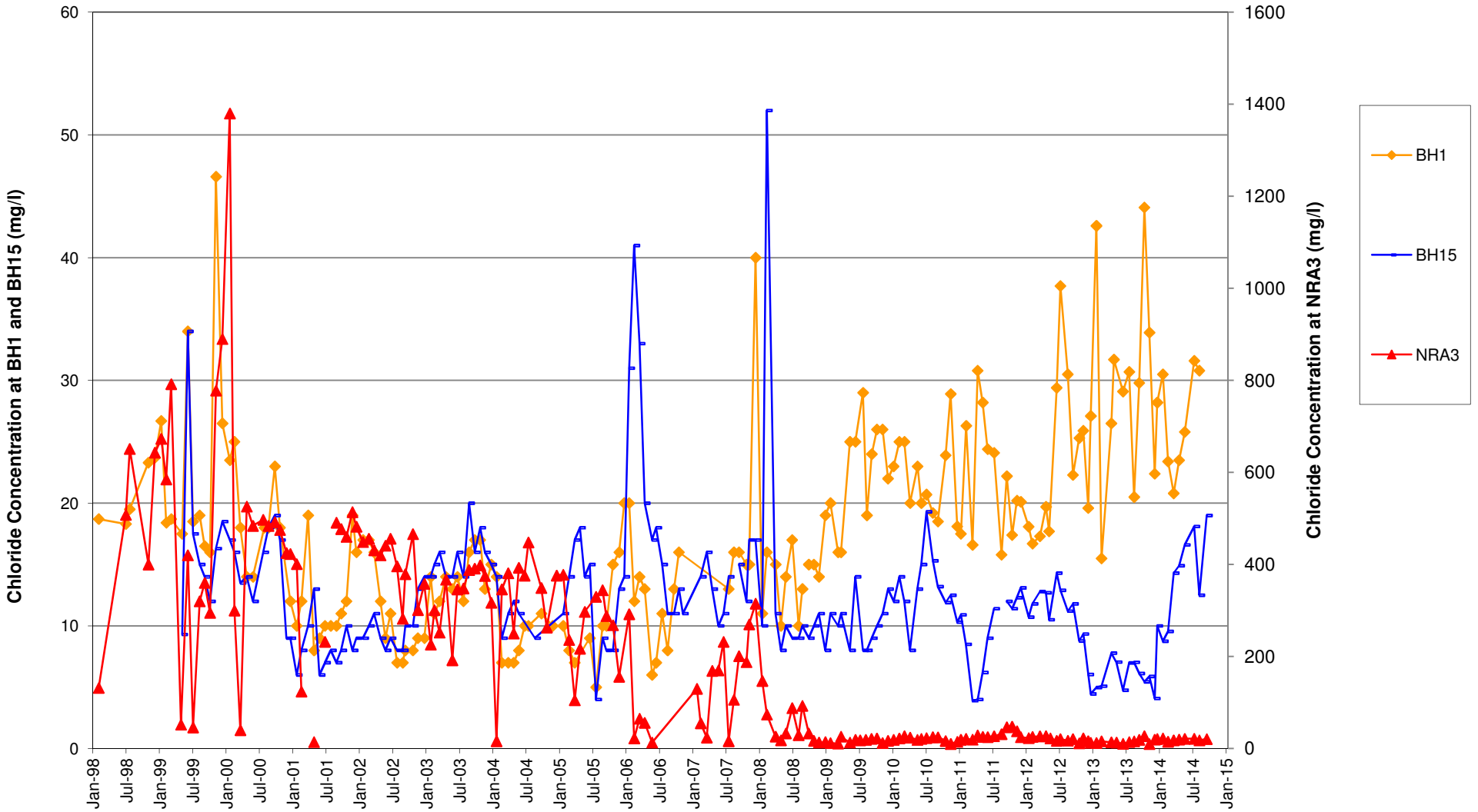
Ffridd Rasus Landfill - Ammoniacal Nitrogen in Groundwater (boreholes 20A, 20B 21A & 21B)

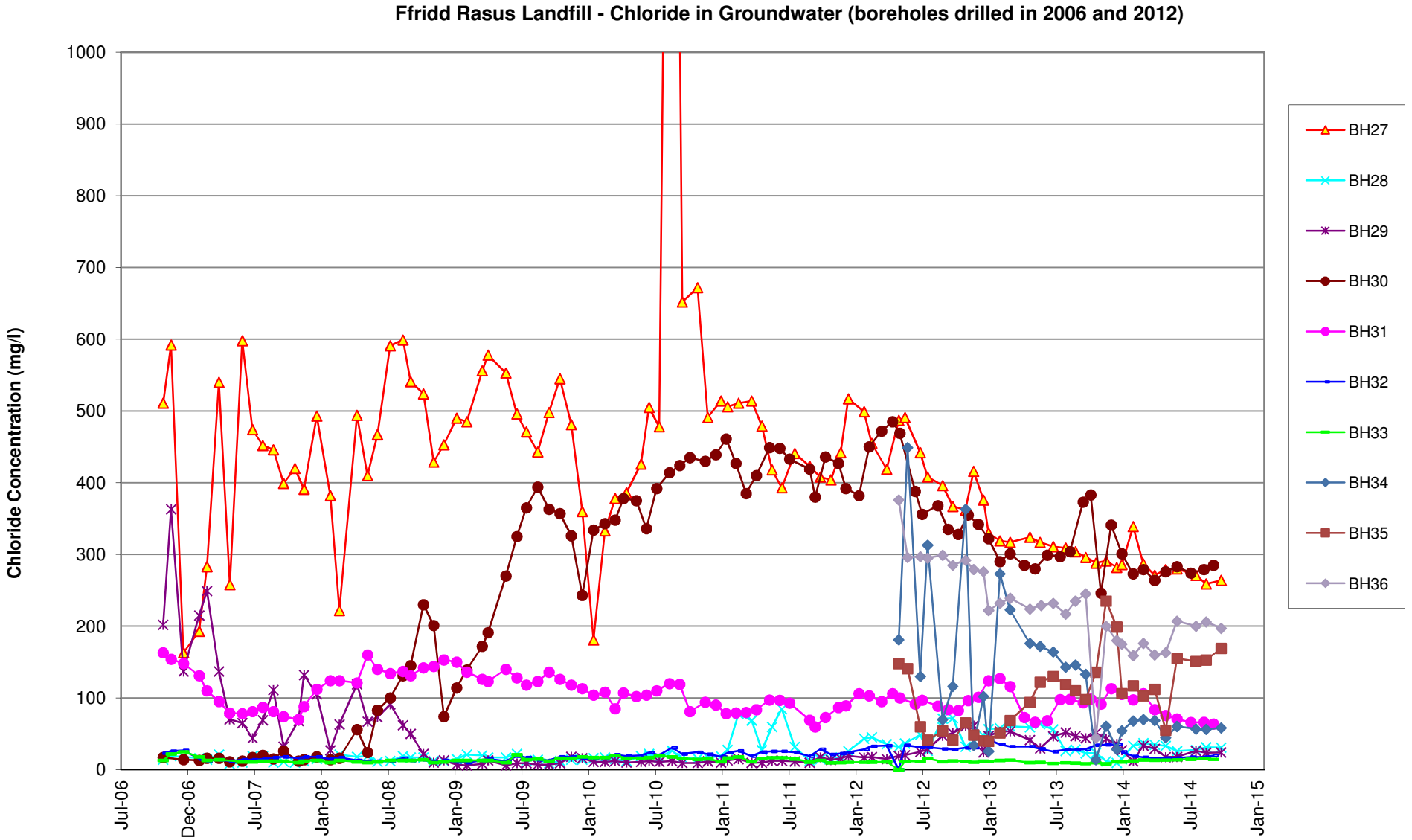


Ffridd Rasus Landfill - Ammoniacal Nitrogen in groundwater (boreholes drilled in 2006 and 2012)

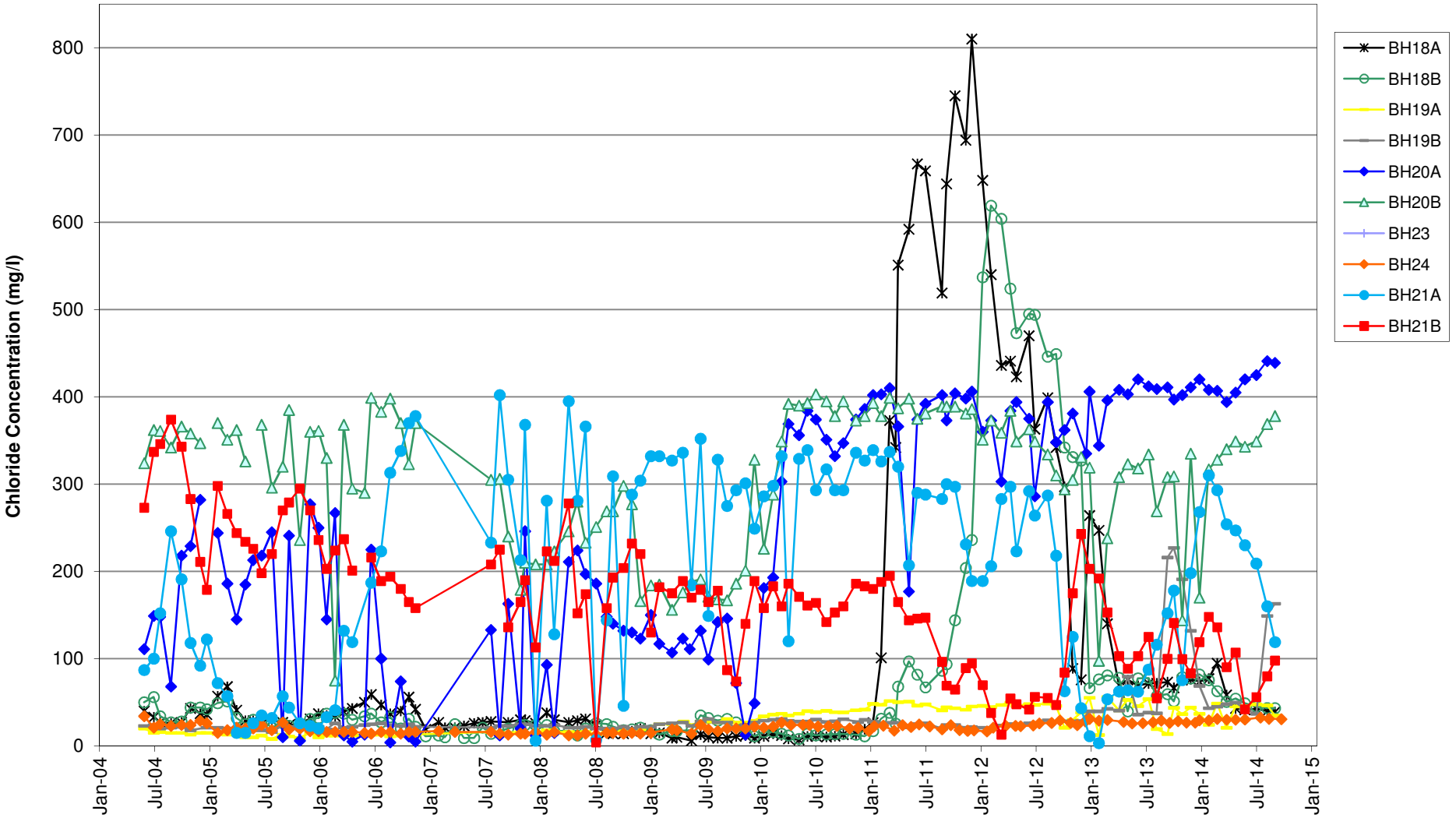


Chloride in Groundwater - boreholes drilled pre 2004

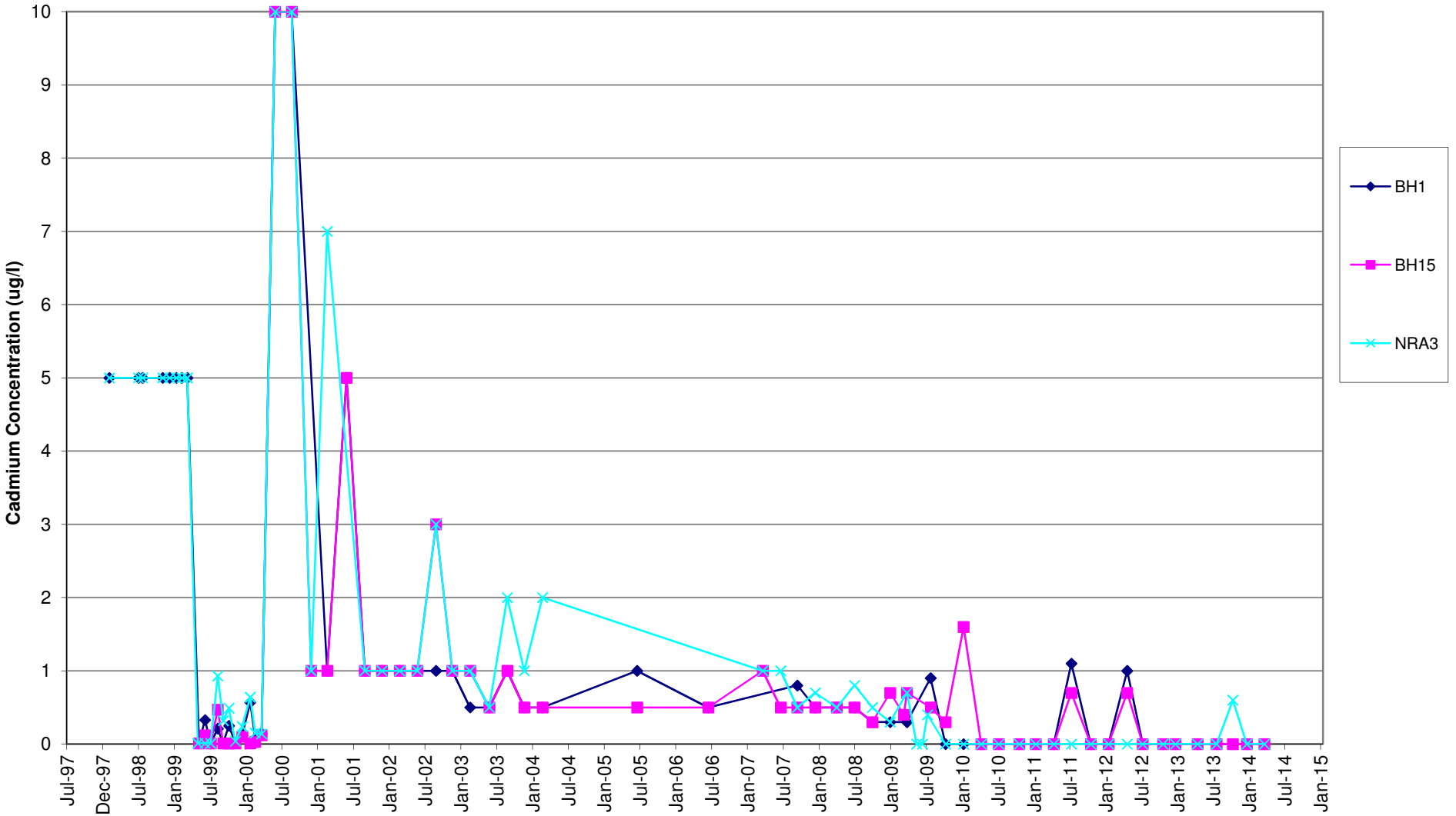



Ffridd Rasus Landfill - Chloride in Groundwater (boreholes drilled in 2006 and 2012)
Chloride Concentration (mg/l)
1000
900
800
700
600
500
400
300
200
100
0
Jul-06
Dec-06
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
BH27
BH28
BH29
BH30
BH31
BH32
BH33
BH34
BH35
BH36

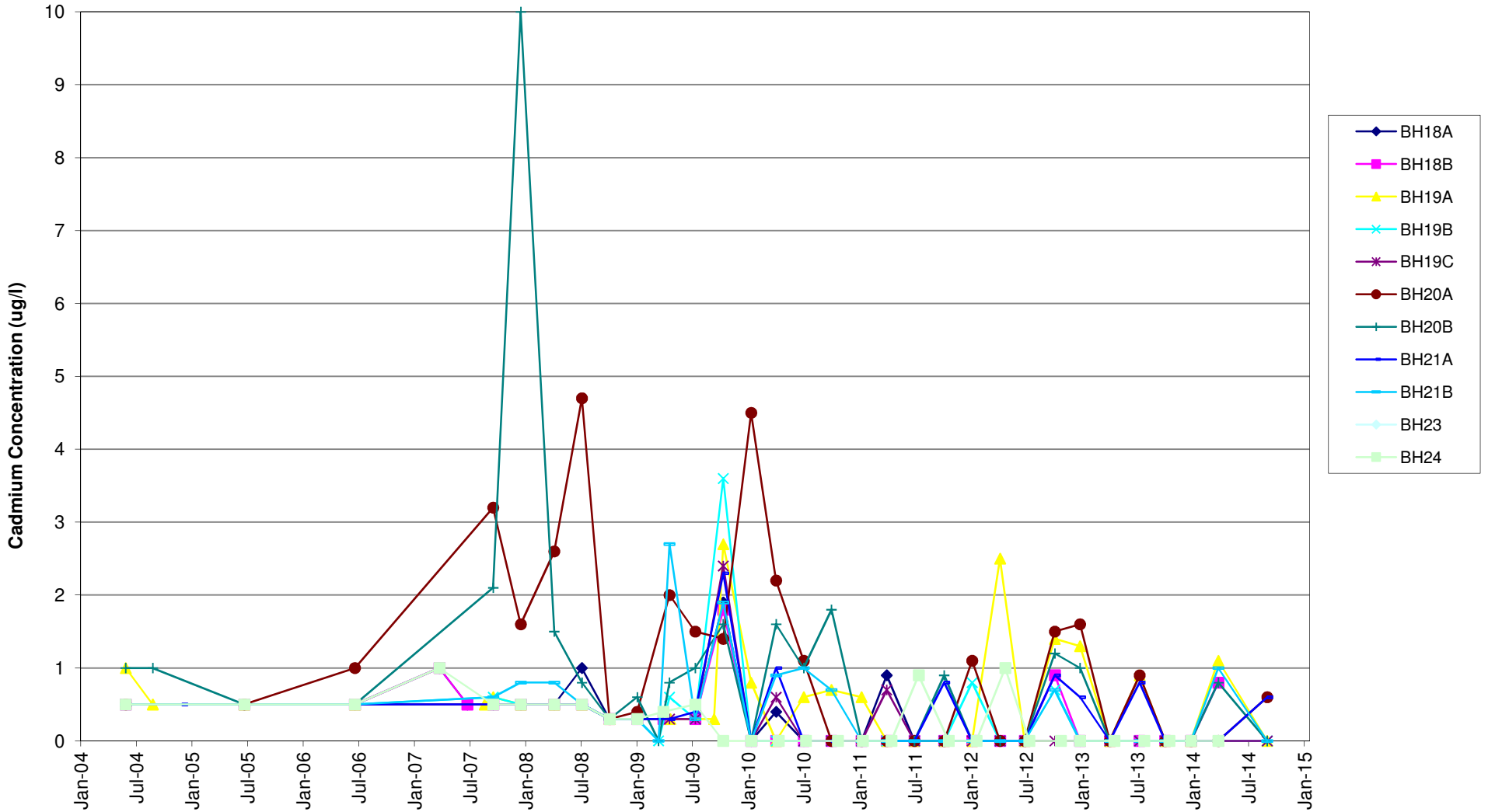
Ffridd Rasus Landfill - Chloride in Groundwater (boreholes drilled in 2004)



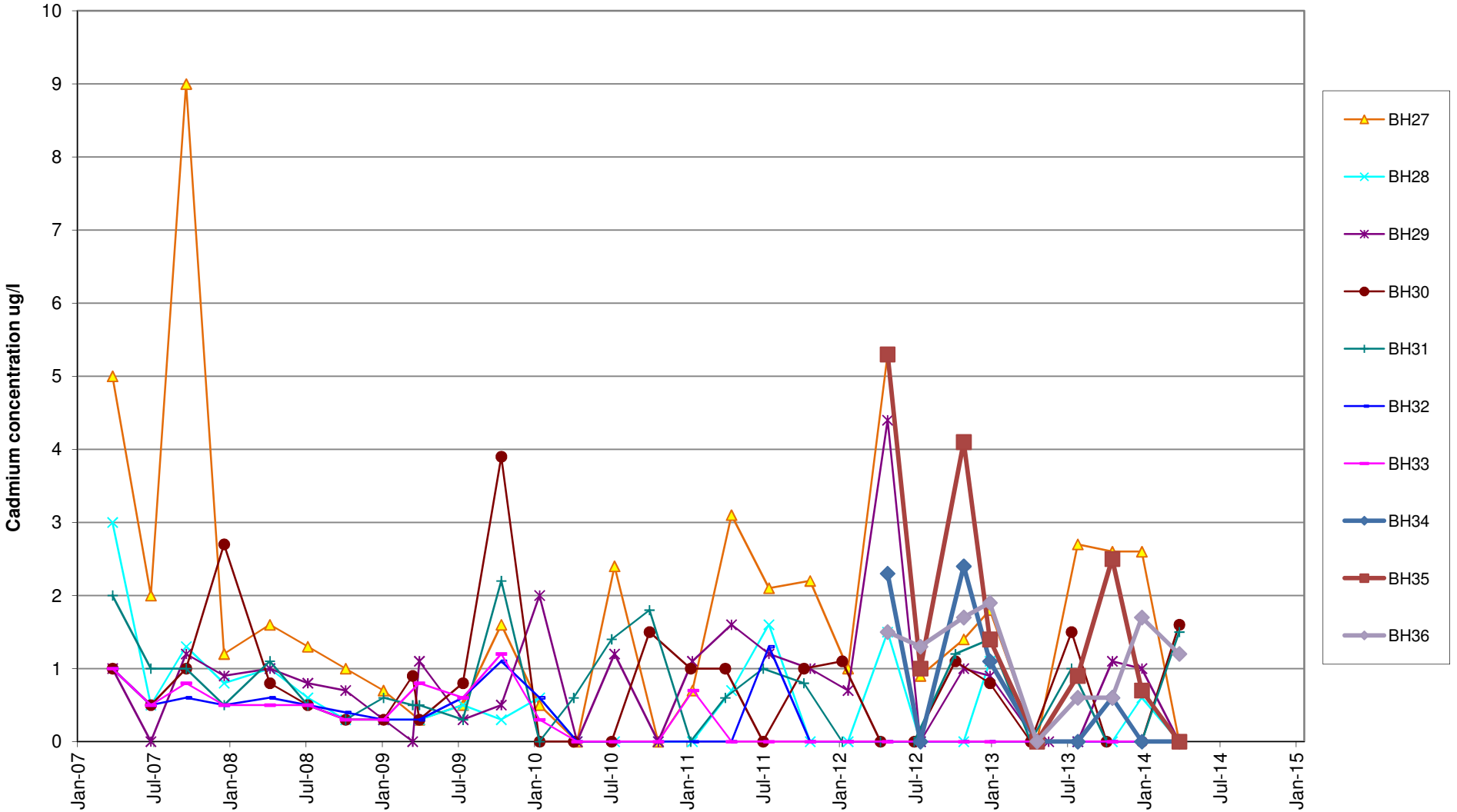
Ffridd Rasus Landfill - Cadmium in Groundwater (boreholes drilled pre 2004)



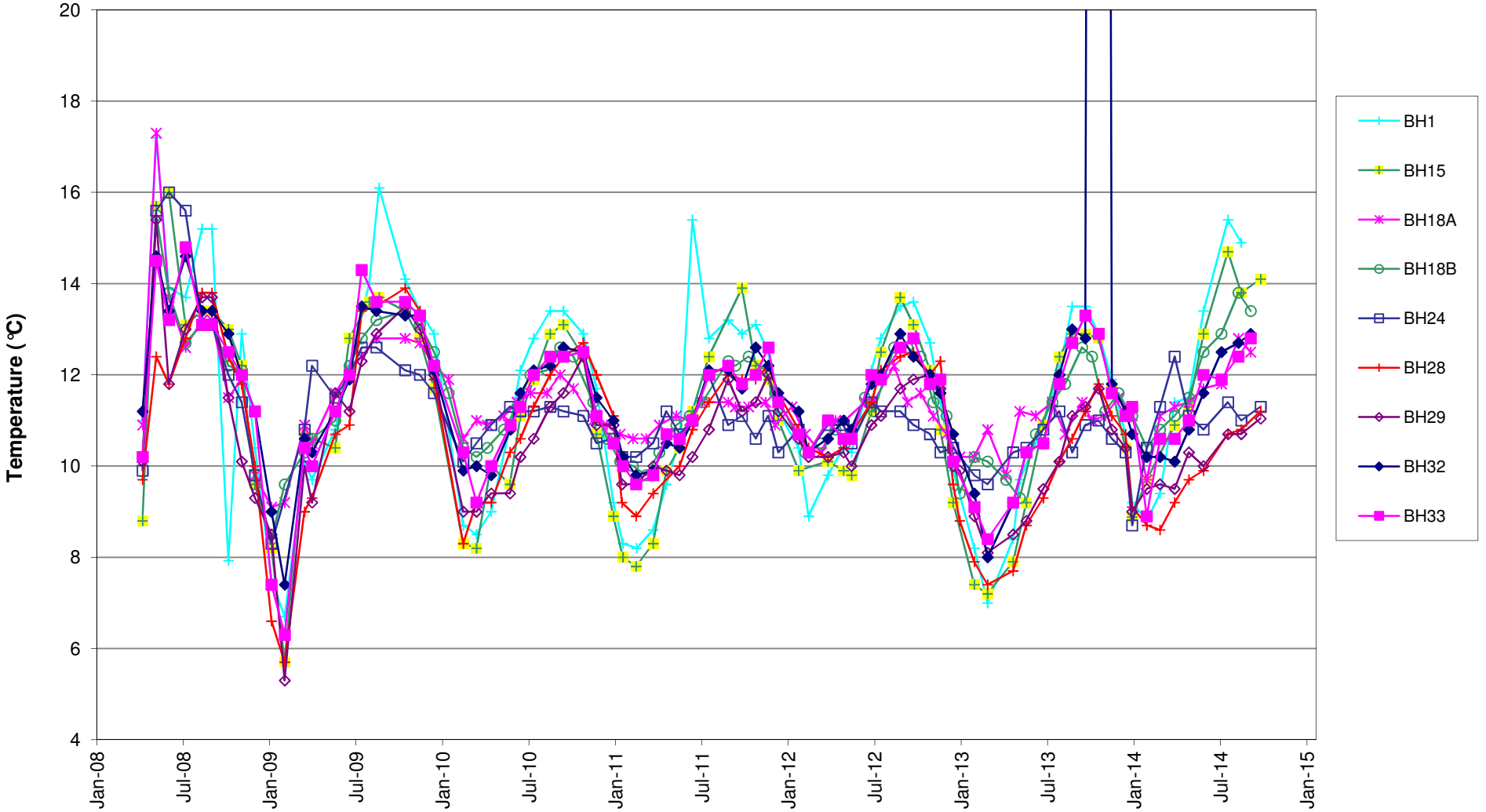
Ffridd Rasus Landfill - Cadmium in Groundwater (boreholes drilled in 2004)



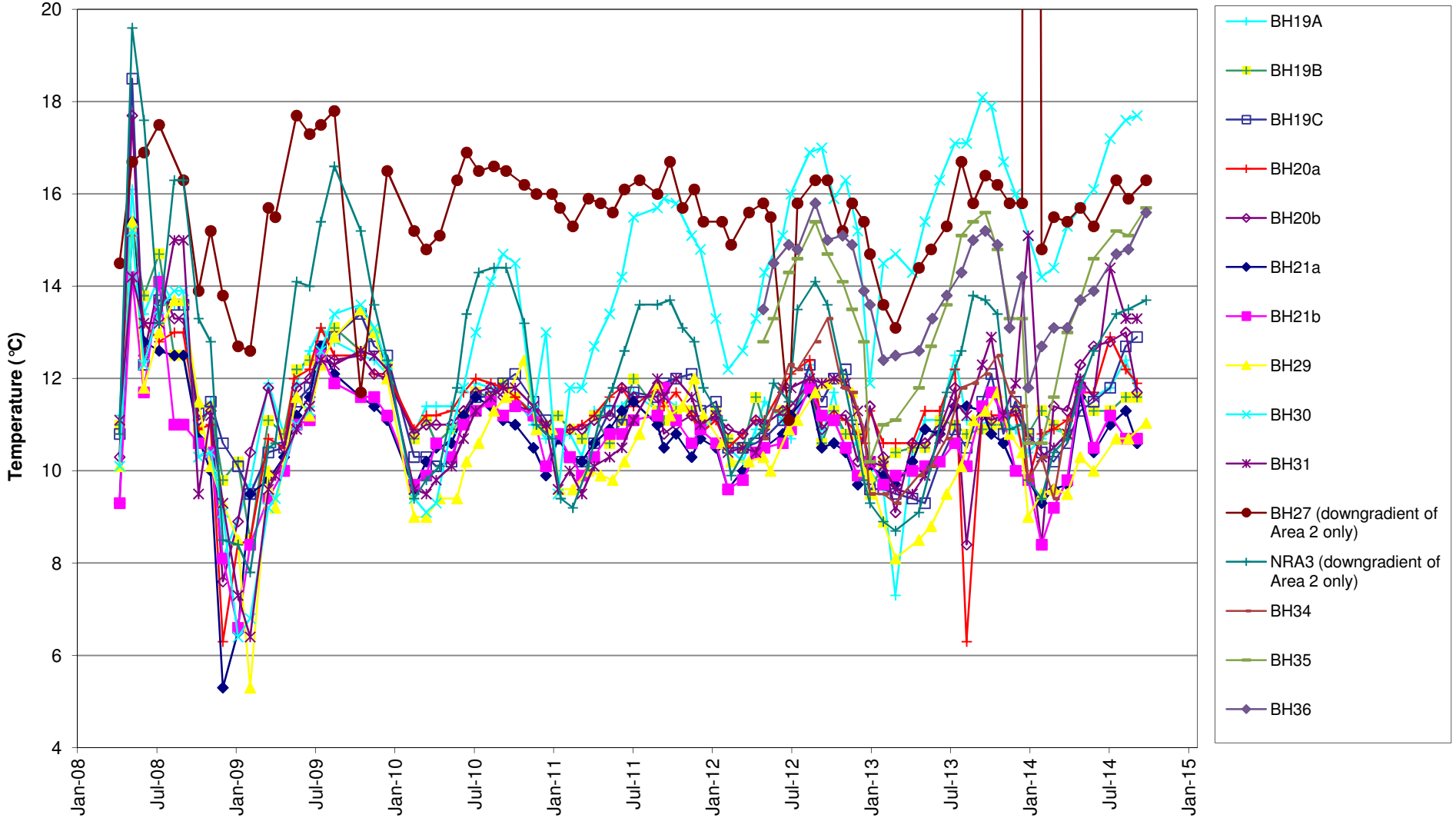
Ffridd Rasus Landfill - Cadmium in Groundwater (boreholes drilled in 2006)



Ffridd Rasus Landfill - Groundwater Temperature (Upgradient/Lateral to Groundwater Flow Boreholes)



Ffridd Rasus Landfill - Groundwater Temperature (Downgradient Boreholes)



Appendix D
Laboratory Analytical Data

104 Pages

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

29 September 2014

Test Report: COV/1137385/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 24 September 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

UKAS TESTING
1314
0897
4409

ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **29 September 2014**

Report Number: **COV/1137385/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: September - Ffridd Rasus

Number of Samples included in this report **7**

Job Received: **24 September 2014**

Number of Test Results included in this report **7**

Analysis Commenced: **25 September 2014**

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1137385/2014** Issue **1**

Laboratory Number: **14249020** Sample **1** of **7**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **24 September 2014**
Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249020: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1137385/2014** Issue **1**

Laboratory Number: **14249021** Sample **2** of **7**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH19B**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **24 September 2014**

Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249021: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1137385/2014** Issue **1**

Laboratory Number: **14249022** Sample **3** of **7**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH19C**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **24 September 2014**

Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249022: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1137385/2014** Issue **1**
Laboratory Number: **14249023** Sample **4** of **7**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **24 September 2014**
Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249023: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**
Title: **Organic Operations Manager**

Certificate of Analysis

UKAS TESTING
1314
0897
4409

ALS Environmental

Report Number: **COV/1137385/2014** Issue **1**
Laboratory Number: **14249024** Sample **5** of **7**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **24 September 2014**
Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249024: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**
Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1137385/2014** Issue **1**

Laboratory Number: **14249025** Sample **6** of **7**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **24 September 2014**
Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249025: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

1314
0897
4409

Report Number: **COV/1137385/2014** Issue **1**

Laboratory Number: **14249026** Sample **7** of **7**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH21B**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **24 September 2014**

Analysis Complete: **29 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Cadmium , Total as Cd	<0.0006	mg/l	29/09/2014	Y Cov	WAS049

Analyst Comments for 14249026: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

ANALYST COMMENTS FOR REPORT COV/1137385/2014 Issue 1

Date of Issue: **29 September 2014**

Sample No	Analysis Comments
14249020	
14249021	
14249022	
14249023	
14249024	
14249025	
14249026	

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1137385/2014 ISSUE 1

Date of Issue : 29 September 2014

Sample No	Description	Determinand	Comments

Signed: A I Horobin

Name: **A. Horobin** Date: **29 September 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
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Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

25 July 2014

Test Report: COV/1122102/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 09 July 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: C. Law

Title: Inorganics Operations Manager

Report Summary

UKAS TESTING
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ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **25 July 2014**

Report Number: **COV/1122102/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: July - Ffridd Rasus

Number of Samples included in this report **16**

Job Received: **09 July 2014**

Number of Test Results included in this report **82**

Analysis Commenced: **11 July 2014**

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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Report Number: **COV/1122102/2014** Issue **1**

Laboratory Number: **14130262** Sample **1** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH18A**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **09 July 2014**

Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1190	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	42.6	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.4	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130262: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130263** Sample **2** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18B**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	896	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	45.2	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.5	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130263: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**
Title: **Inorganics Operations Manager**

Certificate of Analysis

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Report Number: **COV/1122102/2014** Issue **1**

Laboratory Number: **14130264** Sample **3** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH19A**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **09 July 2014**

Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	327	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.83	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	47.6	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130264: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130265** Sample **4** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19B**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	335	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	36.8	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.8	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130265: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**
Title: **Inorganics Operations Manager**

Certificate of Analysis

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Report Number: **COV/1122102/2014** Issue **1**

Laboratory Number: **14130266** Sample **5** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH19C**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **09 July 2014**

Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	577	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	77.5	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.6	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130266: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130267** Sample **6** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2710	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	70.7	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	425	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.8	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130267: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130268** Sample **7** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	3210	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	217	mg/l	15/07/2014	Y	Cov	WAS055
Chloride as Cl	349	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.5	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130268: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**

Laboratory Number: **14130269** Sample **8** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH21A**

Sample Matrix: **Ground waters**

Sample Date/Time:

Sample Received: **09 July 2014**

Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1750	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	49.9	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	209	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.8	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130269: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130270** Sample **9** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21B**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	960	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	66.1	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	56.0	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.5	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130270: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130271** Sample **10** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH23**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	269	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	15.8	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.4	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130271: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130272** Sample **11** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH32**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	257	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	17.5	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	6.0	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130272: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130273** Sample **12** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH33**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	179	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	14.6	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	7.2	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130273: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **25 July 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130274** Sample **13** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH30**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2880	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	206	mg/l	15/07/2014	Y	Cov	WAS055
Chloride as Cl	274	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.6	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130274: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130275** Sample **14** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH31**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1420	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	76.9	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	65.8	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.6	mg/l	15/07/2014	Y	Cov	WAS052

Analyst Comments for 14130275: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130276** Sample **15** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW2**
Sample Matrix: **Surface waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	846	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	6.40	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	112	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/07/2014	Y	Cov	WAS052
COD (Total)	9450	mg/l	22/07/2014	Y	Cov	WAS040

Analyst Comments for 14130276: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1122102/2014** Issue **1**
Laboratory Number: **14130277** Sample **16** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW3**
Sample Matrix: **Surface waters**
Sample Date/Time:
Sample Received: **09 July 2014**
Analysis Complete: **22 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	6.7	pH units	12/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	682	uS/cm	12/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	3.70	mg/l	14/07/2014	Y	Cov	WAS036
Chloride as Cl	49.1	mg/l	14/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/07/2014	Y	Cov	WAS052
COD (Total)	4260	mg/l	22/07/2014	Y	Cov	WAS040

Analyst Comments for 14130277: The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1122102/2014 Issue 1

Date of Issue: **25 July 2014**

Sample No	Analysis Comments
14130262	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130263	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130264	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130265	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130266	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130267	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130268	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130269	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130270	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130271	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130272	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130273	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130274	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130275	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130276	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.
14130277	The date of sampling has not been provided and therefore sample stability times cannot be assessed. It is therefore possible that the results provided may be compromised.

Signed:

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1122102/2014 ISSUE 1

Date of Issue : 25 July 2014

Sample No	Description	Determinand	Comments

Signed: 

Name: **C. Law** Date: **25 July 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

22 August 2014

Test Report: COV/1128963/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 13 August 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: C. Law

Title: Inorganics Operations Manager

Report Summary

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ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **22 August 2014**

Report Number: **COV/1128963/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: August - Ffridd Rasus

Number of Samples included in this report **15**

Job Received: **13 August 2014**

Number of Test Results included in this report **76**

Analysis Commenced: **14 August 2014**

Signed:

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183152** Sample **1** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18A**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1110	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	39.9	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.8	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183152: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183153** Sample **2** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18B**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	894	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.31	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	43.4	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183153: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183154** Sample **3** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19A**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	341	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	3.55	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	46.5	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183154: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183155** Sample **4** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19B**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	949	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	149	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.4	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183155: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183156** Sample **5** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19C**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	856	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	2.55	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	144	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.6	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183156: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183157** Sample **6** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.3	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2710	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	74.9	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	441	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183157: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183158** Sample **7** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	3250	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	217	mg/l	15/08/2014	Y	Cov	WAS055
Chloride as Cl	369	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183158: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183159** Sample **8** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21A**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1410	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	36.5	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	160	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.4	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183159: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183160** Sample **9** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21B**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	691	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	32.8	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	79.9	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.6	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183160: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183161** Sample **10** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH23**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	281	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	17.6	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	5.3	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183161: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183162** Sample **11** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH32**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	274	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	17.6	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183162: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183163** Sample **12** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH33**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	182	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	15.4	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.1	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183163: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183164** Sample **13** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH30**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2880	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	199	mg/l	15/08/2014	Y	Cov	WAS055
Chloride as Cl	279	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.3	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183164: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183165** Sample **14** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH31**
Sample Matrix: **Ground waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.4	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1410	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	77.5	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	66.0	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.5	mg/l	15/08/2014	Y	Cov	WAS052

Analyst Comments for 14183165: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1128963/2014** Issue **1**
Laboratory Number: **14183166** Sample **15** of **15**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW3**
Sample Matrix: **Surface waters**
Sample Date/Time: **12 August 2014**
Sample Received: **13 August 2014**
Analysis Complete: **18 August 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.0	pH units	15/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1330	uS/cm	15/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.33	mg/l	14/08/2014	Y	Cov	WAS036
Chloride as Cl	223	mg/l	14/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	15/08/2014	Y	Cov	WAS052
COD (Total)	8200	mg/l	14/08/2014	Y	Cov	WAS040

Analyst Comments for 14183166: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **22 August 2014**
Title: **Inorganics Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1128963/2014 Issue 1

Date of Issue: **22 August 2014**

Sample No	Analysis Comments
14183152	
14183153	
14183154	
14183155	
14183156	
14183157	
14183158	
14183159	
14183160	
14183161	
14183162	
14183163	
14183164	
14183165	
14183166	

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1128963/2014 ISSUE 1

Date of Issue : 22 August 2014

Sample No	Description	Determinand	Comments

Signed: 

Name: **C. Law** Date: **22 August 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

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F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

03 September 2014

Test Report: COV/1130453/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 20 August 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: G. Coiley

Title: Coventry Operations Manager

Report Summary

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ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **03 September 2014**

Report Number: **COV/1130453/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: August - Ffridd Rasus

Number of Samples included in this report **14**

Job Received: **20 August 2014**

Number of Test Results included in this report **58**

Analysis Commenced: **21 August 2014**

Signed: CACoiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195335** Sample **1** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH34**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	966	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.64	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	56.2	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.4	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195335: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195336** Sample **2** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH35**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1460	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	36.8	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	153	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.0	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195336: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195337** Sample **3** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH36**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1940	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	127	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	206	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.7	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195337: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C Coiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195338** Sample **4** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH27**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2650	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	171	mg/l	22/08/2014	Y	Cov	WAS055
Chloride as Cl	259	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.7	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195338: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195339** Sample **5** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH28**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	270	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	31.2	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.9	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195339: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C Coiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195340** Sample **6** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH29**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	565	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.54	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	23.6	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.2	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195340: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195341** Sample **7** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **NRA3**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.3	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	453	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.87	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	17.9	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.3	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195341: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C Coiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195342** Sample **8** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH1**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	214	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.76	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	30.8	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	12.2	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195342: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C Coiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195343** Sample **9** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH15**
Sample Matrix: **Ground waters**
Sample Date/Time: **19 August 2014**
Sample Received: **20 August 2014**
Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	185	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	12.5	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	8.7	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195343: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195344** Sample **10** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH24**

Sample Matrix: **Ground waters**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	22/08/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	419	uS/cm	22/08/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	22/08/2014	Y	Cov	WAS036
Chloride as Cl	31.1	mg/l	22/08/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	5.0	mg/l	27/08/2014	Y	Cov	WAS052

Analyst Comments for 14195344: This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195345** Sample **11** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP1**

Sample Matrix: **Land Leachate**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Zinc, Total as Zn	<0.018	mg/l	03/09/2014	Y	Cov	WAS049
Mecoprop	22.5	ug/l	23/08/2014	Y	Cov	GEO49

Analyst Comments for 14195345: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195346** Sample **12** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP2**

Sample Matrix: **Land Leachate**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Zinc, Total as Zn	0.04	mg/l	03/09/2014	Y	Cov	WAS049
Mecoprop	28.8	ug/l	23/08/2014	Y	Cov	GEO49

Analyst Comments for 14195346: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195347** Sample **13** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP3**

Sample Matrix: **Land Leachate**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Zinc, Total as Zn	0.04	mg/l	03/09/2014	Y	Cov	WAS049
Mecoprop	36.2	ug/l	23/08/2014	Y	Cov	GEO49

Analyst Comments for 14195347: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1130453/2014** Issue **1**

Laboratory Number: **14195348** Sample **14** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP4A**

Sample Matrix: **Land Leachate**

Sample Date/Time: **19 August 2014**

Sample Received: **20 August 2014**

Analysis Complete: **03 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Zinc, Total as Zn	0.190	mg/l	03/09/2014	Y	Cov	WAS049
Mecoprop	70.8	ug/l	23/08/2014	Y	Cov	GEO49

Analyst Comments for 14195348: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

ANALYST COMMENTS FOR REPORT COV/1130453/2014 Issue 1

Date of Issue: **03 September 2014**

Sample No	Analysis Comments
14195335	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195336	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195337	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195338	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195339	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195340	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195341	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195342	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195343	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195344	This sample has been analysed for Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14195345	
14195346	
14195347	
14195348	

Signed: 

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1130453/2014 ISSUE 1

Date of Issue : 03 September 2014

Sample No	Description	Determinand	Comments

Signed: CAColley

Name: **G. Coiley** Date: **03 September 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd
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Coventry
CV4 9GU

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www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

25 July 2014

Test Report: COV/1124881/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 23 July 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: A I Horobin

Name: A. Horobin

Title: Organic Operations Manager

Report Summary

UKAS TESTING
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ALS Environmental

Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **25 July 2014**

Report Number: **COV/1124881/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: July - Ffridd Rasus

Number of Samples included in this report **16**

Job Received: **23 July 2014**

Number of Test Results included in this report **72**

Analysis Commenced: **24 July 2014**

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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Report Number: **COV/1124881/2014** Issue **1**

Laboratory Number: **14151136** Sample **1** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH34**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1040	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.40	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	56.6	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.2	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151136: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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ALS Environmental

Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151137** Sample **2** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH35**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1480	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	30.4	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	151	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.8	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151137: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151138** Sample **3** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH36**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2060	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	127	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	200	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151138: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1124881/2014** Issue **1**

Laboratory Number: **14151139** Sample **4** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH27**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2800	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	170	mg/l	25/07/2014	Y	Cov	WAS055
Chloride as Cl	271	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151139: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151140** Sample **5** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH28**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	279	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	27.5	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.8	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151140: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151141** Sample **6** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH29**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	634	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.46	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	26.1	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.4	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151141: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151142** Sample **7** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **NRA3**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.4	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	385	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.60	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	21.4	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.9	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151142: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

Certificate of Analysis

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151143** Sample **8** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH1**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.1	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	252	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	5.58	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	31.6	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	6.9	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151143: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151144** Sample **9** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH15**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	186	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.38	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	18.1	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	9.0	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151144: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151145** Sample **10** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH24**
Sample Matrix: **Ground waters**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.4	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	428	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	24/07/2014	Y	Cov	WAS036
Chloride as Cl	32.4	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.2	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151145: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**

Laboratory Number: **14151146** Sample **11** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **SW1**

Sample Matrix: **Surface waters**

Sample Date/Time:

Sample Received: **23 July 2014**

Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		24/07/2014	N Cov	N/A

Analyst Comments for 14151146: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151147** Sample **12** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **SW1 (pipe)**
Sample Matrix: **Surface waters**
Sample Date/Time:
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		24/07/2014	N Cov	N/A

Analyst Comments for 14151147: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**

Laboratory Number: **14151148** Sample **13** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP1**

Sample Matrix: **Leachates from landfill**

Sample Date/Time: **22 July 2014**

Sample Received: **23 July 2014**

Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	9610	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	773	mg/l	25/07/2014	Y	Cov	WAS055
Chloride as Cl	1010	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151148: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**

Laboratory Number: **14151149** Sample **14** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP2**
Sample Matrix: **Leachates from landfill**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	15600	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1500	mg/l	25/07/2014	Y	Cov	WAS055
Chloride as Cl	1640	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151149: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**
Laboratory Number: **14151150** Sample **15** of **16**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP3**
Sample Matrix: **Leachates from landfill**
Sample Date/Time: **22 July 2014**
Sample Received: **23 July 2014**
Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	11800	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1000	mg/l	25/07/2014	Y	Cov	WAS055
Chloride as Cl	1240	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151150: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

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Report Number: **COV/1124881/2014** Issue **1**

Laboratory Number: **14151151** Sample **16** of **16**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LCP4A**

Sample Matrix: **Leachates from landfill**

Sample Date/Time: **22 July 2014**

Sample Received: **23 July 2014**

Analysis Complete: **25 July 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	25/07/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	18900	uS/cm	25/07/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1890	mg/l	25/07/2014	Y	Cov	WAS055
Chloride as Cl	2170	mg/l	24/07/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	25/07/2014	Y	Cov	WAS052

Analyst Comments for 14151151: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1124881/2014 Issue 1

Date of Issue: **25 July 2014**

Sample No	Analysis Comments
14151136	
14151137	
14151138	
14151139	
14151140	
14151141	
14151142	
14151143	
14151144	
14151145	
14151146	
14151147	
14151148	
14151149	
14151150	
14151151	

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1124881/2014 ISSUE 1

Date of Issue : 25 July 2014

Sample No	Description	Determinand	Comments

Signed: A I Horobin

Name: **A. Horobin** Date: **25 July 2014**

Title: **Organic Operations Manager**

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

T: +44 (0)24 7642 1213
F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

18 September 2014

Test Report: COV/1134741/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 10 September 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: C. Law

Title: Inorganics Operations Manager

Report Summary

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Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **18 September 2014**

Report Number: **COV/1134741/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: September - Ffridd Rasus

Number of Samples included in this report **14**

Job Received: **10 September 2014**

Number of Test Results included in this report **70**

Analysis Commenced: **11 September 2014**

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

Certificate of Analysis

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Report Number: **COV/1134741/2014** Issue **1**

Laboratory Number: **14228719** Sample **1** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH18B**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	903	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.87	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	43.3	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228719: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

Certificate of Analysis

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228720** Sample **2** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH18A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1100	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	39.1	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.1	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228720: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

Certificate of Analysis

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228721** Sample **3** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	291	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	2.38	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	34.8	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228721: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228722** Sample **4** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19B**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1110	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.34	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	163	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.9	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228722: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228723** Sample **5** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH19C**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	937	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	4.78	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	173	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228723: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228724** Sample **6** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2500	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	74.5	mg/l	12/09/2014	Y	Cov	WAS036
Chloride as Cl	439	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228724: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228725** Sample **7** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH20B**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	3030	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	207	mg/l	12/09/2014	Y	Cov	WAS055
Chloride as Cl	378	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.7	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228725: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: 

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**

Laboratory Number: **14228726** Sample **8** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21A**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1090	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	26.8	mg/l	12/09/2014	Y	Cov	WAS036
Chloride as Cl	119	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.9	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228726: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228727** Sample **9** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH21B**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	871	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	51.2	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	97.8	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228727: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228728** Sample **10** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH23**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.9	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	280	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	18.2	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.9	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228728: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**

Laboratory Number: **14228729** Sample **11** of **14**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH32**

Sample Matrix: **Ground waters**

Sample Date/Time: **09 September 2014**

Sample Received: **10 September 2014**

Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	286	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	19.7	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	10.7	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228729: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**

Laboratory Number: **14228730** Sample **12** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH33**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.1	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	185	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	11/09/2014	Y	Cov	WAS036
Chloride as Cl	14.5	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.1	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228730: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228731** Sample **13** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH30**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.6	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2710	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	187	mg/l	12/09/2014	Y	Cov	WAS055
Chloride as Cl	285	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.1	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228731: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

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Report Number: **COV/1134741/2014** Issue **1**
Laboratory Number: **14228732** Sample **14** of **14**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH31**
Sample Matrix: **Ground waters**
Sample Date/Time: **09 September 2014**
Sample Received: **10 September 2014**
Analysis Complete: **18 September 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	16/09/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1360	uS/cm	16/09/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	79.0	mg/l	12/09/2014	Y	Cov	WAS036
Chloride as Cl	63.6	mg/l	11/09/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.7	mg/l	18/09/2014	Y	Cov	WAS052

Analyst Comments for 14228732: This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Name: **C. Law** Date: **18 September 2014**
Title: **Inorganics Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1134741/2014 Issue 1

Date of Issue: **18 September 2014**

Sample No	Analysis Comments
14228719	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228720	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228721	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228722	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228723	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228724	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228725	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228726	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228727	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228728	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228729	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228730	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228731	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.
14228732	This sample has been analysed for pH, Dissolved Oxygen, Fixed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed:

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1134741/2014 ISSUE 1

Date of Issue : 18 September 2014

Sample No	Description	Determinand	Comments

Signed: 

Name: **C. Law** Date: **18 September 2014**

Title: **Inorganics Operations Manager**

ALS Environmental Ltd
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Ms Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon LL55 1AT
Gwynedd

15 October 2014

Test Report: COV/1139054/2014

Dear Ms Francis

Analysis of your sample(s) submitted on 01 October 2014 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed:

Name: G. Coiley

Title: Coventry Operations Manager

Report Summary

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Ms Susan Francis
Gwynedd Council (UDG)
Gwynedd Council (UDG)
Waste Treatment Services
5-7 Bangor Street
Caernarfon
Gwynedd
LL55 1AT

Date of Issue: **15 October 2014**

Report Number: **COV/1139054/2014** Issue **1**

Job Description: Ffridd Rasus

Job Location: September - Ffridd Rasus

Number of Samples included in this report **18**

Job Received: **01 October 2014**

Number of Test Results included in this report **118**

Analysis Commenced: **02 October 2014**

Signed: CACoiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated. Sampling is not covered by our UKAS accreditation.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262874** Sample **1** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH34**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.3	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	989	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.45	mg/l	03/10/2014	Y	Cov	WAS036
Chloride as Cl	58.3	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.3	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262874: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**
Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**

Laboratory Number: **14262875** Sample **2** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH35**

Sample Matrix: **Ground waters**

Sample Date/Time: **30 September 2014**

Sample Received: **01 October 2014**

Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.2	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1540	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	46.4	mg/l	03/10/2014	Y	Cov	WAS036
Chloride as Cl	169	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.5	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262875: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262876** Sample **3** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH36**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.5	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	1980	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	126	mg/l	06/10/2014	Y	Cov	WAS036
Chloride as Cl	197	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.2	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262876: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262877** Sample **4** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH27**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.4	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	2670	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	173	mg/l	05/10/2014	Y	Cov	WAS055
Chloride as Cl	264	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	0.5	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262877: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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ALS Environmental

Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262878** Sample **5** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH28**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.7	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	382	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/10/2014	Y	Cov	WAS036
Chloride as Cl	30.8	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	1.3	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262878: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262879** Sample **6** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH29**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.0	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	546	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	2.36	mg/l	03/10/2014	Y	Cov	WAS036
Chloride as Cl	24.0	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	2.1	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262879: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262880** Sample **7** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **NRA3**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.3	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	542	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	1.03	mg/l	03/10/2014	Y	Cov	WAS036
Chloride as Cl	20.7	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	4.2	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262880: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262881** Sample **8** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH1**
Sample Matrix: **Ground waters**
Sample Date/Time:
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		02/10/2014	N Cov	N/A

Analyst Comments for 14262881: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **15 October 2014**
Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262882** Sample **9** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **BH15**
Sample Matrix: **Ground waters**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	7.8	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	243	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	0.85	mg/l	03/10/2014	Y	Cov	WAS036
Chloride as Cl	19.0	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	8.9	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262882: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**

Laboratory Number: **14262883** Sample **10** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **BH24**

Sample Matrix: **Ground waters**

Sample Date/Time: **30 September 2014**

Sample Received: **01 October 2014**

Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
pH	8.2	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	433	uS/cm	03/10/2014	Y	Cov	WAS039
Ammoniacal Nitrogen as N	<0.27	mg/l	06/10/2014	Y	Cov	WAS036
Chloride as Cl	30.7	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	3.9	mg/l	03/10/2014	Y	Cov	WAS052

Analyst Comments for 14262883: This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262884** Sample **11** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP1**
Sample Matrix: **Land Leachate**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0015	mg/l	08/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	111	mg/l	08/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	47.3	mg/l	08/10/2014	Y	Cov	WAS049
Potassium , Total as K	384	mg/l	08/10/2014	Y	Cov	WAS049
Sodium , Total as Na	821	mg/l	08/10/2014	Y	Cov	WAS049
pH	7.7	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	9110	uS/cm	03/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	4020	mg/l	09/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	788	mg/l	05/10/2014	Y	Cov	WAS055
Chloride as Cl	953	mg/l	03/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	03/10/2014	Y	Cov	WAS036
Sulphate as SO4	86.2	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	03/10/2014	Y	Cov	WAS052
BOD + ATU (5 day)	55	mg/l	11/10/2014	Y	Cov	WAS001
COD (Total)	974	mg/l	06/10/2014	Y	Cov	WAS040
TOC (Filtered)	270	mg/l	08/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14262884: This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}
Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley
Name: **G. Coiley** Date: **15 October 2014**
Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262885** Sample **12** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP2**
Sample Matrix: **Land Leachate**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0015	mg/l	08/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	97.3	mg/l	08/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	76.8	mg/l	08/10/2014	Y	Cov	WAS049
Potassium , Total as K	687	mg/l	08/10/2014	Y	Cov	WAS049
Sodium , Total as Na	1280	mg/l	08/10/2014	Y	Cov	WAS049
pH	7.8	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	15000	uS/cm	03/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	7540	mg/l	09/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	1480	mg/l	05/10/2014	Y	Cov	WAS055
Chloride as Cl	1650	mg/l	03/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	03/10/2014	Y	Cov	WAS036
Sulphate as SO4	100	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	03/10/2014	Y	Cov	WAS052
BOD + ATU (5 day)	76	mg/l	11/10/2014	Y	Cov	WAS001
COD (Total)	1740	mg/l	06/10/2014	Y	Cov	WAS040
TOC (Filtered)	508	mg/l	08/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14262885: This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}
Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262886** Sample **13** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP3**
Sample Matrix: **Land Leachate**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0028	mg/l	08/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	184	mg/l	08/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	65.1	mg/l	08/10/2014	Y	Cov	WAS049
Potassium , Total as K	516	mg/l	08/10/2014	Y	Cov	WAS049
Sodium , Total as Na	1120	mg/l	08/10/2014	Y	Cov	WAS049
pH	7.7	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	11600	uS/cm	03/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	5740	mg/l	09/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	995	mg/l	05/10/2014	Y	Cov	WAS055
Chloride as Cl	1280	mg/l	03/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	<0.42	mg/l	03/10/2014	Y	Cov	WAS036
Sulphate as SO4	<1.3	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	03/10/2014	Y	Cov	WAS052
BOD + ATU (5 day)	81	mg/l	11/10/2014	Y	Cov	WAS001
COD (Total)	1580	mg/l	06/10/2014	Y	Cov	WAS040
TOC (Filtered)	448	mg/l	08/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14262886: This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}
Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: G Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262887** Sample **14** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LCP4A**
Sample Matrix: **Land Leachate**
Sample Date/Time: **30 September 2014**
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation		Method
Cadmium , Total as Cd	0.0018	mg/l	08/10/2014	Y	Cov	WAS049
Calcium , Total as Ca	128	mg/l	08/10/2014	Y	Cov	WAS049
Magnesium, Total as Mg	71.0	mg/l	08/10/2014	Y	Cov	WAS049
Potassium , Total as K	734	mg/l	08/10/2014	Y	Cov	WAS049
Sodium , Total as Na	1470	mg/l	08/10/2014	Y	Cov	WAS049
pH	7.9	pH units	03/10/2014	Y	Cov	WAS039
Conductivity- Electrical 20C	17700	uS/cm	03/10/2014	Y	Cov	WAS039
Alkalinity as CaCO3	9250	mg/l	09/10/2014	Y	Cov	WAS025
Ammoniacal Nitrogen as N	1870	mg/l	05/10/2014	Y	Cov	WAS055
Chloride as Cl	2040	mg/l	03/10/2014	Y	Cov	WAS036
Nitrogen, Total Oxidised as N	0.45	mg/l	03/10/2014	Y	Cov	WAS036
Sulphate as SO4	305	mg/l	03/10/2014	Y	Cov	WAS036
Dissolved Oxygen, Fixed	<0.5	mg/l	03/10/2014	Y	Cov	WAS052
BOD + ATU (5 day)	189	mg/l	11/10/2014	Y	Cov	WAS001
COD (Total)	3600	mg/l	06/10/2014	Y	Cov	WAS040
TOC (Filtered)	950	mg/l	08/10/2014	Y	Cov	WAS005
Phenols Mono (Phenol Index)	Analyst Com	mg/l	15/10/2014	Y	Cov	WAS019

Analyst Comments for 14262887: This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*}
Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: C A Coiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**

Laboratory Number: **14262888** Sample **15** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LW4A**

Sample Matrix: **Land Leachate**

Sample Date/Time:

Sample Received: **01 October 2014**

Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		02/10/2014	N Cov	N/A

Analyst Comments for 14262888: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

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Report Number: **COV/1139054/2014** Issue **1**

Laboratory Number: **14262889** Sample **16** of **18**

Sample Source: **Gwynedd Council (UDG)**

Sample Point Description:

Sample Description: **LW5A**

Sample Matrix: **Land Leachate**

Sample Date/Time:

Sample Received: **01 October 2014**

Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		02/10/2014	N Cov	N/A

Analyst Comments for 14262889: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

Certificate of Analysis

UKAS TESTING
1314
0897
4409

ALS Environmental

Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262890** Sample **17** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LW6A**
Sample Matrix: **Land Leachate**
Sample Date/Time:
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		02/10/2014	N Cov	N/A

Analyst Comments for 14262890: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CACoiley

Name: **G. Coiley** Date: **15 October 2014**
Title: **Coventry Operations Manager**

Certificate of Analysis

UKAS TESTING
1314
0897
4409

ALS Environmental

Report Number: **COV/1139054/2014** Issue **1**
Laboratory Number: **14262891** Sample **18** of **18**

Sample Source: **Gwynedd Council (UDG)**
Sample Point Description:
Sample Description: **LW13**
Sample Matrix: **Land Leachate**
Sample Date/Time:
Sample Received: **01 October 2014**
Analysis Complete: **15 October 2014**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Sample Received	'Empty'		02/10/2014	N Cov	N/A

Analyst Comments for 14262891: No Analyst Comment

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: Cov = Coventry(CV4 9GU), Run = Runcorn(WA7 1SL), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for sample volume analysed).
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: CAColley

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

ANALYST COMMENTS FOR REPORT COV/1139054/2014 Issue 1

Date of Issue: **15 October 2014**

Sample No	Analysis Comments
14262874	
14262875	
14262876	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14262877	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14262878	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14262879	
14262880	
14262881	
14262882	
14262883	This sample has been analysed for Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised.
14262884	This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*} Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}
14262885	This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*} Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}
14262886	This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*} Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}
14262887	This sample has been analysed for BOD + ATU (5 day), Ammoniacal Nitrogen as N outside recommended stability times. It is therefore possible that the results provided may be compromised. {/*} Unable to analyse for Monophenol as a precipitate is formed upon acidification, making the sample unsuitable for segmented flow analysis.{*/}
14262888	
14262889	
14262890	
14262891	

Signed: 

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

DETERMINAND COMMENTS FOR REPORT COV/1139054/2014 ISSUE 1

Date of Issue : 15 October 2014

Sample No	Description	Determinand	Comments

Signed: 

Name: **G. Coiley** Date: **15 October 2014**

Title: **Coventry Operations Manager**

Appendix E
Schedule 6 Submissions to NRW

8 Pages

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	GP3330BY (Variation number QP3134LY/V003)
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill Site Areas 1 and 3, Morfa Road,
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 25/07/2014

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit						
To be notified within 24 hours of detection unless otherwise specified below						
Emission point reference/source	BH 19 A	BH 19B	BH 19C	BH 20A		BH 21A
Parameter(s)	Cl	Cl	Cl	NH4	Cl	NH4
Limit	29mg/l	28mg/l	30mg/l	5mg/l	310mg/l	5.10mg/l
Measured value and uncertainty	47.6mg/l	36.8mg/l	77.5mg/l	70.7mg/l	425mg/l	49.9mg/l
Date and time of monitoring	09/07/14					
Measures taken, or intended to be taken, to stop the emission						

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	22/09/14

* authorised to sign on behalf of Gwynedd Council

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	GP3330BY (Variation number QP3134LY/V003)
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill Site Areas 1 and 3, Morfa Road,
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 22/08/2014

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit						
To be notified within 24 hours of detection unless otherwise specified below						
Emission point reference/source	BH 19 A	BH 19B	BH 19C	BH 20A		BH 21A
Parameter(s)	Cl	Cl	Cl	NH4	Cl	NH4
Limit	29mg/l	28mg/l	30mg/l	5mg/l	310mg/l	5.10mg/l
Measured value and uncertainty	46.5mg/l	149mg/l	144mg/l	74.9mg/l	441mg/l	36.5mg/l
Date and time of monitoring	12/08/14					
Measures taken, or intended to be taken, to stop the emission						

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	24/09/14

* authorised to sign on behalf of Gwynedd Council

Schedule 6 – Notification

This page outlines the information that the operator must provide.

Units of measurement in the information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit number	GP3330BY (Variation number QP3134LY/V003)
Name of operator	Gwynedd Council
Location of installation	Ffridd Rasus Landfill Site Areas 1 and 3, Morfa Road,
	Harlech, Gwynedd, LL46 2UW
Time and date of detection	Results received on 18/09/2014

(a) Notification requirements for any malfunction, breakdown or failure of equipment or technique, accident, or fugitive emission which has caused, is causing or may cause significant pollution
To be notified within 24 hours of detection

Date and Time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substance(s) potentially released	
Best estimate of the quality or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of limit							
To be notified within 24 hours of detection unless otherwise specified below							
Emission point reference/source	BH 19 A	BH 19B	BH 19C		BH 20A		BH 21A
Parameter(s)	Cl	Cl	NH4	Cl	NH4	Cl	NH4
Limit	29mg/l	28mg/l	3mg/l	30 mg/l	5 mg/l	310mg/l	5.10mg/l
Measured value and uncertainty	34.8mg/l	163mg/l	4.78mg/l	173mg/l	74.5mg/l	439mg/l	26.8mg/l
Date and time of monitoring	10/09/14						
Measures taken, or intended to be taken, to stop the emission							

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substance(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B to be supplied as soon as practicable

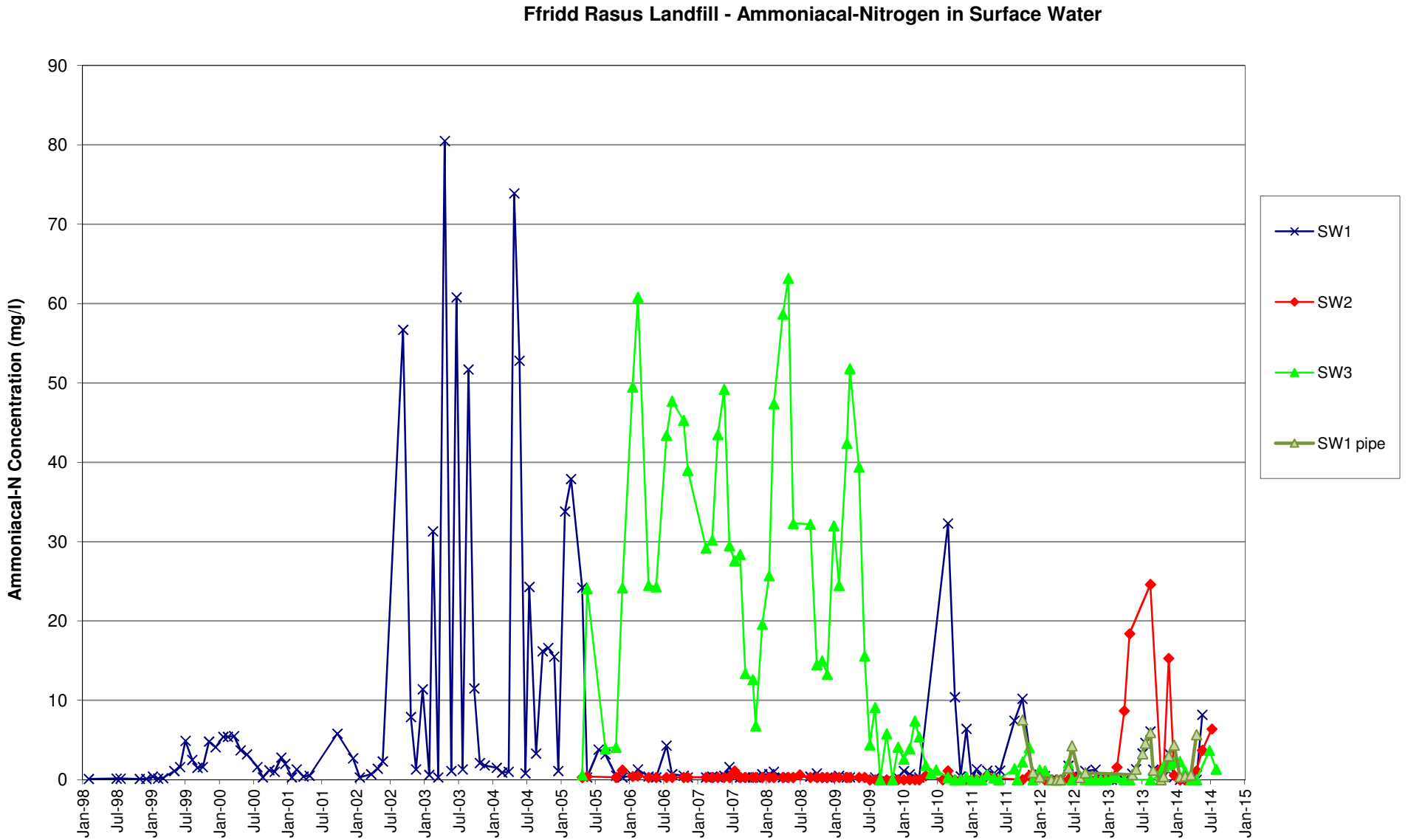
Any more accurate information on the matters for notification under Part A	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the proceeding 24 months	

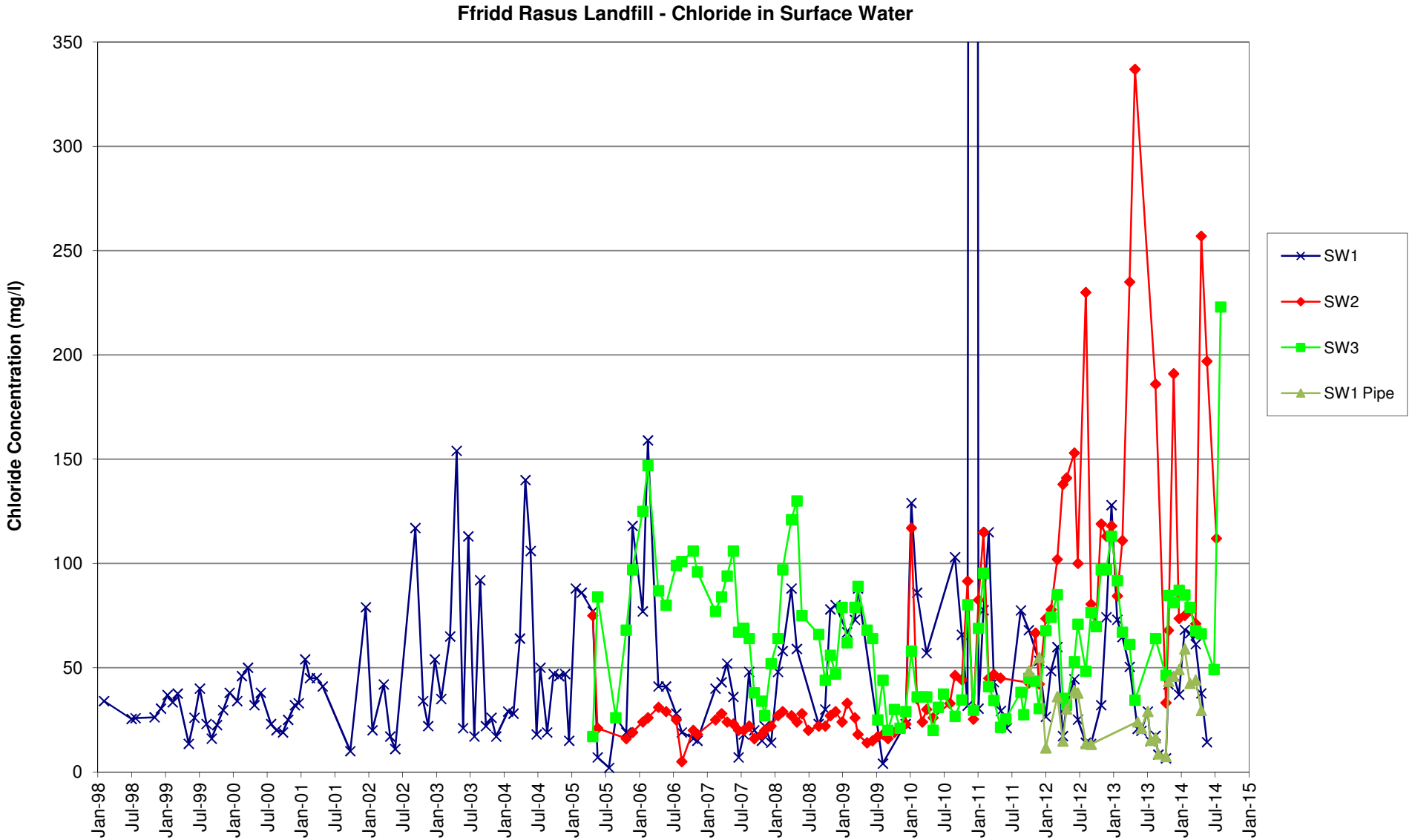
Name *	Susan Francis
Post	Assistant Engineer
Signature	
Date	22/09/14

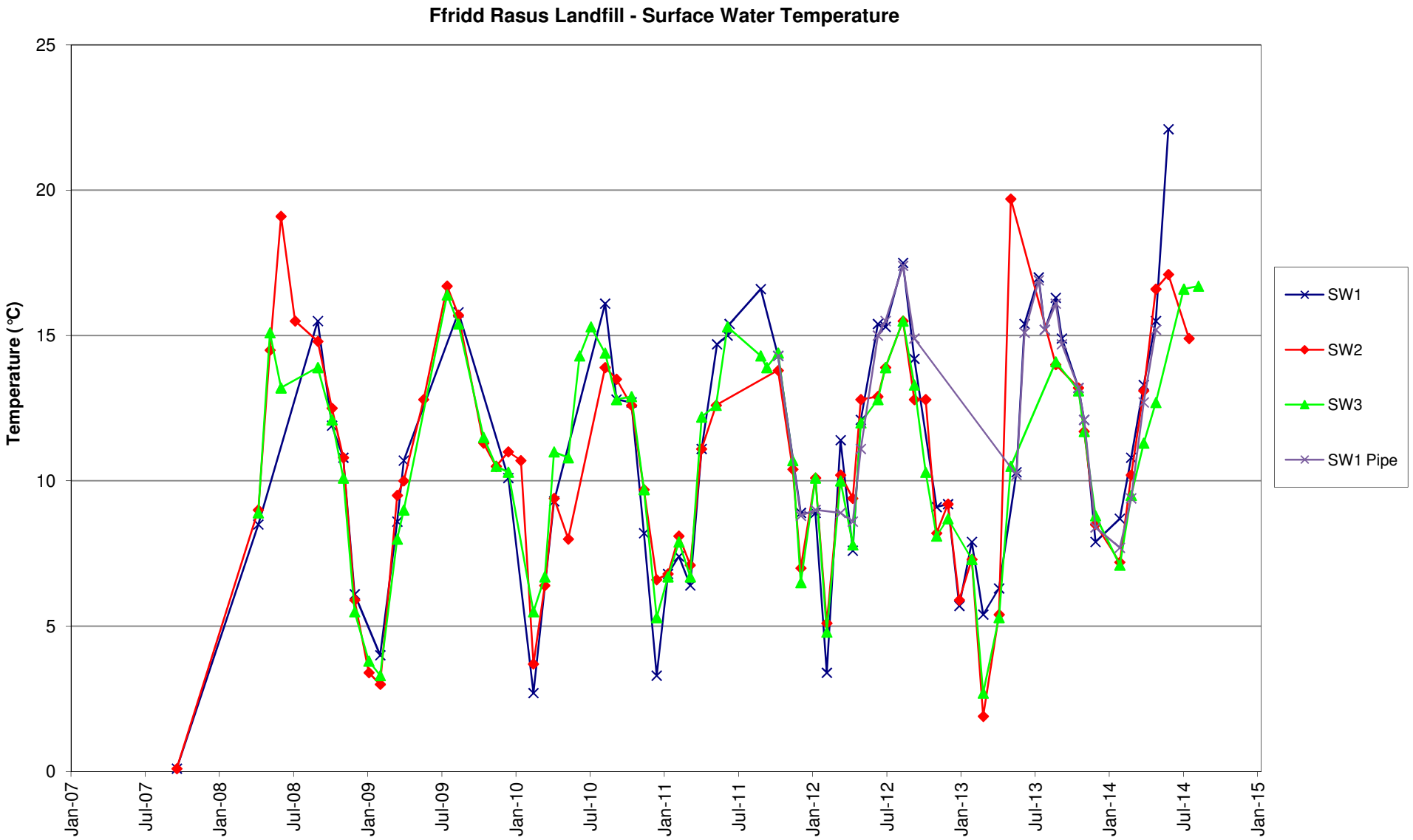
* authorised to sign on behalf of Gwynedd Council

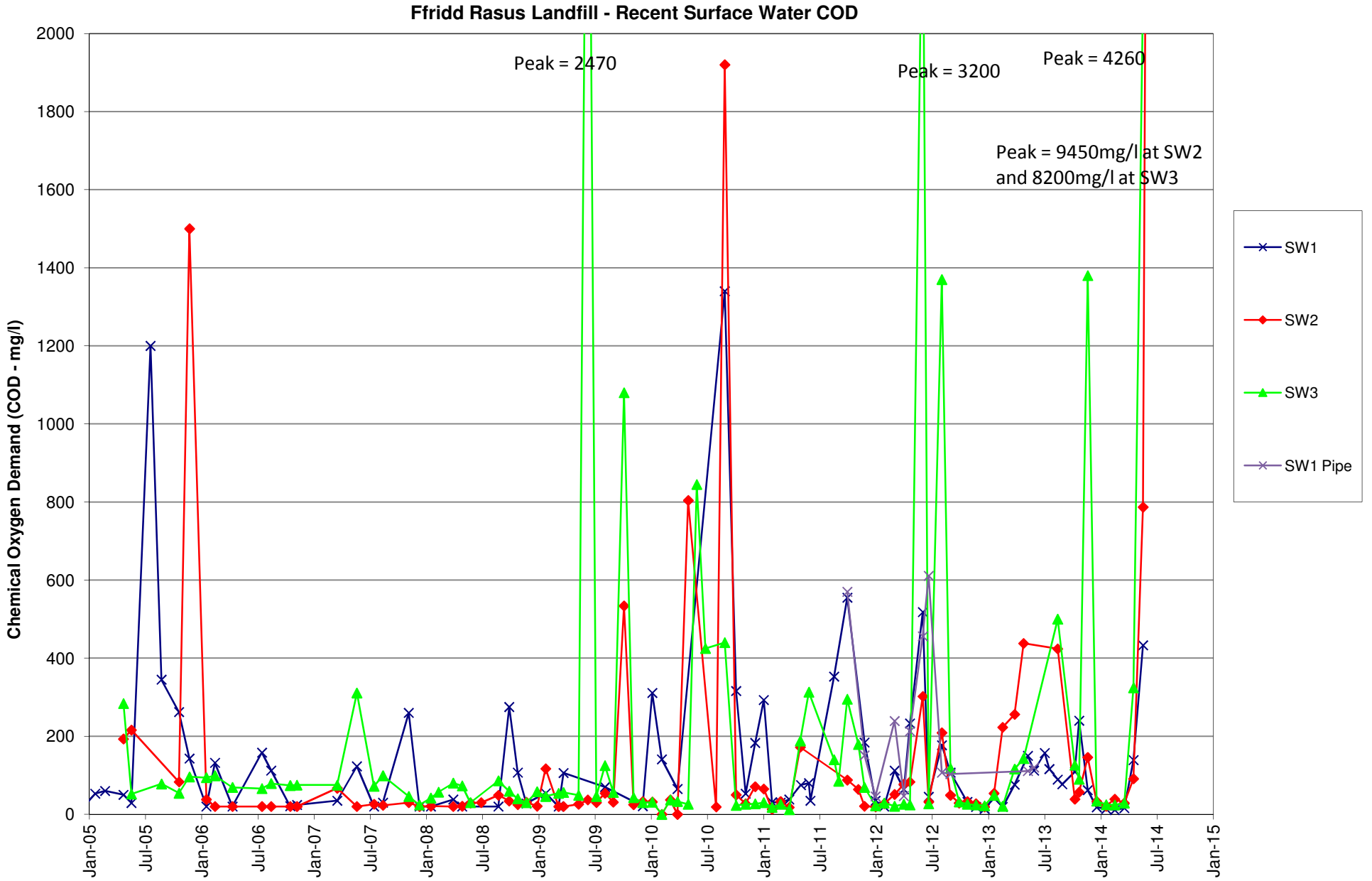
Appendix F
Surface Water Quality Plots and Observations at SW1 and SW3

7 Pages


Ffridd Rasus Landfill - Ammoniacal-Nitrogen in Surface Water
Ammoniacal-N Concentration (mg/l)
90
80
70
60
50
40
30
20
10
0
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
SW1
SW2
SW3
SW1 pipe


Ffridd Rasus Landfill - Chloride in Surface Water
Chloride Concentration (mg/l)
350
300
250
200
150
100
50
0
Jan-98
Jul-98
Jan-99
Jul-99
Jan-00
Jul-00
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
SW1
SW2
SW3
SW1 Pipe


Ffridd Rasus Landfill - Surface Water Temperature
Temperature (°C)
25
20
15
10
5
0
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
SW1
SW2
SW3
SW1 Pipe



H:\Projects\28587 Llwyn Isaf & Ffridd Rasus Consultancy Support\Data\Ffridd Rasus\Data for Quarterly Reports\Data July-September 2014\Ffridd Rasus Surface Water 2014 Q3.xlsCOD SW

Ffridd Rasus Landfill Site
Point source emissions to water (table S4.3)

Interceptor drain – location SW 1
Sluice – location SW 3

Date	Location	Description of water		Further comments :-
		Surface film or Oil	Is the SW location dry?	Weather
20/5/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
29/5/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
6/6/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	NO	DRY
10/6/14	SW 1	CLEAR	NO	DRY
	SW 3	CLEAR	YES	DRY
17/6/14	SW 1	CLEAR	YES	HOT
	SW 3	CLEAR	YES	HOT
23/6/14	SW 1	CLEAR	YES	HOT
	SW 3	CLEAR	YES	HOT
2/7/14	SW 1	CLEAR	YES	WARM
	SW 3	CLEAR	YES	WARM
8/7/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	DRY
17/7/14	SW 1	CLEAR	YES	WARM
	SW 3	CLEAR	YES	WARM

Ffridd Rasus Landfill Site
Point source emissions to water (table S4.3)

Interceptor drain – location SW 1
Sluice – location SW 3

Date	Location	Description of water		Further comments :-
		Surface film or Oil	Is the SW location dry?	Weather
July 22/8/14	SW 1	CLEAR	YES	DRY/HOT
	SW 3	CLEAR	YES	DRY/HOT
July 30/8/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	DRY
12/8/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	DRY
Aug 20/8/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	SHOWERS
26/8/14	SW 1	CLEAR	YES	SHOWERS
	SW 3	CLEAR	YES	SUNNY
4/9/14	SW 1	CLEAR	YES	SUNNY
	SW 3	CLEAR	YES	DRY
Sept. 8/9/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	SUNNY
15/9/14	SW 1	CLEAR	YES	SUNNY
	SW 3	CLEAR	YES	SUNNY
22/9/14	SW 1	CLEAR	YES	SUNNY
	SW 3	CLEAR	YES	SUNNY

Ffridd Rasus Landfill Site
Point source emissions to water (table S4.3)

Interceptor drain – location SW 1
Sluice – location SW 3

Date	Location	Description of water		Further comments :-
		Surface film or Oil	Is the SW location dry?	Weather
30/9/14	SW 1	CLEAR	YES	DRY
	SW 3	CLEAR	YES	DRY
7/10/14	SW 1	CLEAR	NO	SHOWERS
	SW 3	CLEAR	NO	SHOWERS
14/10/14	SW 1	CLEAR	YES	SUNNY
	SW 3	CLEAR	YES	SUNNY
	SW 1			
	SW 3			
	SW 1			
	SW 3			
	SW 1			
	SW 3			
	SW 1			
	SW 3			
	SW 1			
	SW 3			
	SW 1			
	SW 3			
	SW 1			
	SW 3			

Appendix G
Gas Balancing Data

Pages

July

ID	DATE	CH4 %	CO2 %	O2 %	BARO mb	BALANCE %	CO ppm	H2S ppm
weighbridge								
FFRIWEIG	01/08/2013 09:30	0.5	0.1	20.2	1007	79.2	1	1
FFRIBH13	01/08/2013 09:25	0.5	0.7	19.7	1006	79.1	1	1
FFRIBH14	01/08/2013 09:28	0.5	0.5	19.9	1007	79.1	1	1
External wells								
FFRBHG01	31/07/2013 11:10	0.5	0.4	21.2	1011	77.9	0	1
FFRBHG02	31/07/2013 11:14	0.5	0.4	21.3	1012	77.8	1	1
FFRBHG02	31/07/2013 11:16	0.5	0.8	20.9	1012	77.8	1	1
FFRBHG03	31/07/2013 11:24	0.5	0.1	21.6	1012	77.8	1	1
FFRBHG04	31/07/2013 11:27	0.5	0.1	21.6	1012	77.8	0	1
FFRIBH34	01/08/2013 09:08	0.5	1.2	19.8	1005	78.5	0	1
FFRIBH35	01/08/2013 09:11	0.5	1.4	19.2	1005	78.9	0	1
FFRIBH36	01/08/2013 09:15	0.5	1.6	19.2	1006	78.7	0	1
Cell 1								
FFRILCP1	31/07/2013 11:36	58	31.2	0.5	1011	10.3	7	1
FFRLM1#1	31/07/2013 11:39	65	41.9	0.2	1011	0	7	37
FFRLM1#2	31/07/2013 11:33	0.5	10.3	9.5	1011	79.7	2	1
Cell 2								
FFRID2#1	31/07/2013 11:43	65.1	39.9	0.3	1011	0	7	72
FFRID2#2	31/07/2013 11:49	64.4	38.9	0.3	1011	0	6	12
Cell 3								
FFRILCP3	31/07/2013 11:55	64.3	42.1	0.2	1011	0	11	161
FFRID3#1	31/07/2013 11:58	64.4	42.1	0.2	1011	0	11	172
FFRID3#2	31/07/2013 11:52	52.9	38.8	0.2	1011	8.1	10	42
Cell 4								
FFRILW4A	31/07/2013 10:53	0.8	0.5	20.9	1011	77.8	1	1

ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VALVE POSITION %
Cell 1										
FR_LCP01	29/07/2014 13:43	67.3	25.3	0.1	7.3	6.92	0	0	1023	2
FR_LM1/1	29/07/2014 13:46	38.4	28.2	0.1	33.3	32.92	1	0.02	1018	0
FR_LM1/2	29/07/2014 13:41	0.1	7.8	11.7	80.4	36.17	0	-0.75	1020	0
FR_C0011	29/07/2014 13:57	34.3	18.9	0	46.8	46.8	5	-0.55	1021	0
FR_C0012	29/07/2014 13:55	40	20.7	0	39.3	39.3	5	0.31	1021	2
FR_C0013	29/07/2014 13:52	46.9	25.8	0	27.3	27.3	4	-0.92	1022	25
FR_C0014	29/07/2014 13:54	13.7	18.3	0.6	67.4	65.13	8	-0.12	1021	0
Cell 2										
FR_LCP02	29/07/2014 14:07	58.7	37.1	0.7	3.5	0.85	6	-1.54	1022	25
FR_LM2/1	29/07/2014 14:10	64.2	37.7	0	0	0	10	0.63	1022	2
FR_LM2/2	29/07/2014 14:00	33.9	28.4	0	37.7	37.7	4	-0.17	1020	0
FR_C0021	29/07/2014 13:45	54.6	33.5	0.1	11.8	11.42	6	-0.75	1018	25
FR_C0022	29/07/2014 14:06	48.5	33.6	1.3	16.6	11.69	5	-9.68	1022	25
FR_C0023	29/07/2014 14:09	56.9	37.1	0	6	6	15	-9.63	1022	100
FR_C0024	29/07/2014 13:48	45.8	28.2	5.4	20.6	0.19	3	0.27	1022	0
FR_C0025	29/07/2014 13:49	60.1	35.9	0	4	4	6	-0.96	1022	25
Cell 3										
FR_LM3/1	29/07/2014 11:25	7.5	18.6	1.3	72.6	67.69	2	-1.49	1021	0
FR_LCP03	29/07/2014 11:15	37.9	26.8	6.2	29.1	5.66	1	-0.68	1022	0
FR_C0031	29/07/2014 14:35	50.9	36.6	0	12.5	12.5	25	-5.14	1021	50
FR_C0032	29/07/2014 11:12	2.7	4.6	15.7	77	17.65	12	-1.04	1039	0
FR_C0033	29/07/2014 11:17	30.1	28.5	0.2	41.2	40.44	6	-3.14	1020	0
FR_C0034	29/07/2014 14:34	61.6	39.2	0	0	0	45	-10.3	1021	100
FR_C0035	29/07/2014 13:51	42.9	31.8	0.2	25.1	24.34	6	-6.64	1022	50
FR_C0036	29/07/2014 11:22	24.2	26.2	0	49.6	49.6	2	-2.39	1023	0
Cell 4A										
FR_LM4/2	29/07/2014 14:21	60.4	40.5	0	0	0	12	-7.46	1022	100
FR_LCP4A	29/07/2014 14:18	60.7	40.1	0	0	0	19	-8.03	1021	100
FR_C0041	29/07/2014 14:32	61.9	39.7	0	0	0	22	-10.69	1021	100
FR_C0042	29/07/2014 14:16	62.7	39.3	0	0	0	17	-8.27	1025	100
FR_C0043	29/07/2014 14:13	62.5	39.7	0	0	0	21	-8.22	1021	100
FR_C0044	29/07/2014 14:14	60.6	40.1	0	0	0	20	-7.94	1025	100
FR_C0045	29/07/2014 14:17	61.3	40.3	0	0	0	26	-7.98	1025	100
FR_C0046	29/07/2014 14:33	61.3	40.1	0	0	0	50	-10.33	1022	100
Cell 4B										
FR_LCP4B	29/07/2014 14:26	61.1	41.1	0	0	0	16	-10.35	1021	100
FR_C0051	29/07/2014 14:31	60.7	40.6	0	0	0	66	-10.64	1021	100
FR_C0052	29/07/2014 14:30	61.9	40.9	0	0	0	44	-9.99	1021	100
FR_C0053	29/07/2014 14:19	60.8	41.7	0	0	0	119	-8.03	1021	100
FR_C0054	29/07/2014 14:20	62.5	41	0	0	0	60	-7.67	1021	100
FR_C0055	29/07/2014 14:25	62.1	40.4	0	0	0	21	-10.9	1022	100
FR_C0056	29/07/2014 14:27	61.4	40.7	0	0	0	84	-10.09	1021	100
FR_C0057	29/07/2014 14:28	59.9	42.6	0	0	0	179	-10.37	1021	100

Aug

Model GA5000 Serial No G500196
Date down 21/08/2014 09:57 Software V 1.7.0.0
Computer i LAP6LN4C4J 826303
Date of last 01/01/2226
Date of last 05/06/2014
Next servic 06/12/2014
Date of last 01/02/2011
Security co [27680021]

ID	DATE	CH4 %	CO2 %	O2 %	BARO mb	BALANCE %	CO ppm	H2S ppm
Weighbridge								
FFRIWEIG	14/08/2014 11:52	0.1	0.1	21.1	1028	78.7	0	1
FFRIBH13	14/08/2014 11:56	0.1	0.8	20.4	1033	78.7	0	1
FFRIBH14	14/08/2014 11:59	0.1	0.5	20.5	1025	78.9	0	1
External wells								
FFRBHG01	14/08/2014 13:14	0.1	0.5	20.5	1016	78.9	0	0
FFRBHG02	14/08/2014 13:18	0.1	0.6	20.5	1026	78.8	0	1
FFRBHG03	14/08/2014 13:21	0.1	2.6	18.7	1031	78.6	0	1
FFRBHG04	14/08/2014 13:25	0.1	0.1	20.9	1030	78.9	0	1
FFRIBH34	14/08/2014 14:11	0.1	1	20.1	1035	78.8	4	1
FFRIBH35	14/08/2014 14:07	0.1	1.8	19.5	1034	78.6	4	0
FFRIBH36	14/08/2014 14:04	0.1	2.1	19.2	1033	78.6	4	0
Cell 1								
FFRILCP1	14/08/2014 13:32	24	17	1.4	1033	57.6	3	4
FFRLM1#1	14/08/2014 13:34	38.2	27.5	0.2	1026	34.1	3	1
FFRLM1#2	14/08/2014 13:29	15.1	22.3	0.7	1030	61.9	15	7
Cell 2								
FFRID2#1	14/08/2014 13:43	35.5	31	0.3	1034	33.2	4	4
FFRID2#2	14/08/2014 13:40	39.9	31	0.1	1033	29	4	6
Cell 3								
FFRILCP3	14/08/2014 14:01	55.9	36.9	1.4	1035	5.8	10	0
FFRID3#1	14/08/2014 13:53	60.9	41.6	0.2	1034	0	15	109
FFRID3#2	14/08/2014 13:58	61.8	40.4	0.2	1033	0	17	33
Cell 4								
FFRID4#1	14/08/2014 13:47	61.5	40.7	0.1	1034	0	17	358
FFRID4#2	14/08/2014 13:49	62.1	41.2	0.1	1035	0	11	207

ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VALVE POSITION %
Cell 1										
FR_LCP01	13/08/2014 12:50	24.7	17.4	0.7	57.2	54.55	1	0.82	1013	0
FR_LM1/1	13/08/2014 12:55	38.7	27.5	0	33.8	33.8	2	2.22	1008	0
FR_LM1/2	13/08/2014 12:48	17.4	21.5	0.2	60.9	60.14	10	0.61	1010	0
FR_C0011	13/08/2014 13:08	31.6	23	0	45.4	45.4	6	0.7	1008	0
FR_C0012	13/08/2014 13:07	20.4	21.3	0	58.3	58.3	6	1.3	1007	0
FR_C0013	13/08/2014 13:04	42.7	27.3	0.1	29.9	29.52	6	-0.85	1009	25
FR_C0014	13/08/2014 13:05	18.7	22.5	0.5	58.3	56.41	8	1.2	1009	0
Cell 2										
FR_LCP02	13/08/2014 14:02	55.8	36	0.9	7.3	3.9	4	-0.03	1007	0
FR_LM2/1	13/08/2014 14:06	45.2	33.9	0	20.9	20.9	5	1.13	1006	50
FR_LM2/2	13/08/2014 13:12	46.3	33.1	0	20.6	20.6	6	1.4	1007	2
FR_C0021	13/08/2014 12:53	35.9	29.6	0.1	34.4	34.02	6	-2.72	1006	10
FR_C0022	13/08/2014 13:51	38.6	31.5	1.4	28.5	23.21	3	-8.54	1011	25
FR_C0023	13/08/2014 14:04	50	35.6	0	14.4	14.4	13	-8.2	1008	100
FR_C0024	13/08/2014 12:59	41.5	26.4	6.6	25.5	0.55	7	1.04	1006	0
FR_C0025	13/08/2014 13:01	55.4	36	0	8.6	8.6	8	-1.09	1008	25
Cell 3										
FR_LCP03	13/08/2014 11:56	54.2	36.2	1.7	7.9	1.47	1	-0.43	1006	0
FR_LM3/1	13/08/2014 12:01	62.5	40.8	0	0	0	10	-1.09	1008	2
FR_C0031	13/08/2014 15:03	61.6	39.2	0	0	0	23	-4.39	1007	100
FR_C0032	13/08/2014 11:54	23.1	19.1	8.8	49	15.74	9	-0.12	1006	0
FR_C0033	13/08/2014 11:58	62.5	38.7	0	0	0	8	-0.38	1007	0
FR_C0034	13/08/2014 15:02	62.3	39.7	0	0	0	40	-8.39	1007	100
FR_C0035	13/08/2014 13:02	61.2	38.4	0.1	0.3	0	9	-5.77	1008	100
FR_C0036	13/08/2014 11:59	64	40.1	0	0	0	4	-0.22	1007	2
Cell 4A										
FR_LCP4A	13/08/2014 14:38	61	40.8	0	0	0	18	-7.24	1008	100
FR_LM4/2	13/08/2014 14:43	61.8	41.4	0	0	0	13	-7.33	1007	100
FR_C0041	13/08/2014 14:58	61.8	40.1	0	0	0	23	-8.92	1007	100
FR_C0042	13/08/2014 14:32	61.7	38.5	0	0	0	15	-7.99	1008	100
FR_C0042	13/08/2014 14:35	62.1	38.8	0	0	0	16	-7.11	1008	100
FR_C0043	13/08/2014 14:29	61.8	39.1	0.2	0	0	21	-8.18	1012	100
FR_C0044	13/08/2014 14:30	60.9	40	0	0	0	19	-8.2	1009	100
FR_C0045	13/08/2014 14:37	61.6	40.1	0	0	0	25	-7.24	1008	100
FR_C0046	13/08/2014 15:00	61.7	40	0	0	0	47	-8.49	1007	100
Celll 4B										
FR_LCP4B	13/08/2014 14:48	59.5	40.3	0.4	0	0	15	-7.67	1008	100
FR_C0051	13/08/2014 14:55	61.2	41	0	0	0	68	-8.74	1009	100
FR_C0052	13/08/2014 14:53	61.1	41.2	0	0	0	33	-8.54	1009	100
FR_C0053	13/08/2014 14:40	61.6	41.4	0	0	0	97	-7.17	1008	100
FR_C0054	13/08/2014 14:41	61.1	41.4	0	0	0	41	-9.09	1008	100
FR_C0055	13/08/2014 14:47	62	40.1	0	0	0	22	-8.15	1007	100
FR_C0056	13/08/2014 14:50	61.7	40.6	0	0	0	89	-7.91	1008	100
FR_C0057	13/08/2014 14:51	59.9	41.5	0	0	0	155	-8.18	1009	100

Sep-14

ID	DATE	CH4 %	CO2 %	O2 %	BARO mb	BALANCE %	CO ppm	H2S ppm
weighbridge								
FFRIWEIG	15/09/2014 11:34	0	0.1	20.5	1032	79.4	0	0
FFRIBH13	15/09/2014 12:46	0	0.6	20.4	1039	79	0	0
FFRIBH14	15/09/2014 12:43	0	0.4	20.6	1026	79	0	0
External wells								
FFRBHG01	15/09/2014 12:58	0	0	20.8	1040	79.2	0	0
FFRBHG02	15/09/2014 13:01	0	0.3	20.6	1041	79.1	0	0
FFRBHG03	15/09/2014 13:04	0	1.9	19.3	1034	78.8	0	0
FFRBHG04	15/09/2014 13:07	0	0.1	20.7	1041	79.2	0	0
FFRIBH34	15/09/2014 13:51	0	0.6	20.1	1039	79.3	4	0
FFRIBH35	15/09/2014 13:48	0	0.8	20	1041	79.2	4	0
FFRIBH36	15/09/2014 13:44	0	1.7	19.4	1041	78.9	5	0
Cell 1								
FFRILCP1	15/09/2014 13:13	22.7	18.2	1.1	1039	58	1	0
FFRLM1#1	15/09/2014 13:16	19.4	20.3	2.6	1040	57.7	2	0
FFRLM1#2	15/09/2014 13:10	0	3.4	16.8	1038	79.8	0	0
Cell 2								
FFRID2#1	15/09/2014 13:23	62.7	37.8	0.1	1040	0	4	12
FFRID2#2	15/09/2014 13:18	10.2	17.3	3.7	1040	68.8	1	0
Cell 3								
FFRILCP3	15/09/2014 13:41	55.9	36.6	1	1041	6.5	10	0
FFRID3#1	15/09/2014 13:27	57.2	39.8	0.8	1041	2.2	8	10
FFRID3#2	15/09/2014 13:39	56.6	38.7	0.5	1041	4.2	14	10
Cell 4								
FFRID4#1	15/09/2014 13:35	63	40.7	0.1	1040	0	17	43
FFRID4#2	15/09/2014 13:32	59.9	40.9	0.2	1034	0	11	156

ID	Date/Time	CH4 %	CO2 %	O2 %	BALANCE %	RESIDUAL NITROGEN %	CO ppm	SUCTION PRESSURE mb	ATMOS - PHERIC PRESSURE mb	VALVE POSITION %
FR_LCP01	18/09/2014 11:37	17.4	17.3	0.7	64.6	61.95	3	0.09	1015	0
FR_LM1/1	18/09/2014 11:41	3.7	15.4	2.9	78	67.04	6	0.34	1013	0
FR_LM1/2	18/09/2014 11:34	0	3.7	16	80.3	19.82	1	0	1014	0
FR_C0011	18/09/2014 11:55	20.1	21	0.1	58.8	58.42	6	0.15	1011	0
FR_C0012	18/09/2014 11:53	12.6	19.2	0	68.2	68.2	8	1.16	1010	0
FR_C0013	18/09/2014 11:49	22.9	21.6	0.1	55.4	55.02	8	-4.61	1013	0
FR_C0014	18/09/2014 11:52	14.2	16.2	4.5	65.1	48.09	7	0.38	1010	0
FR_LCP02	18/09/2014 14:05	42.9	31.6	0.9	24.6	21.2	9	-11.51	1017	25
FR_LM2/1	18/09/2014 14:08	60.9	37	0.1	2	1.62	12	0.02	1009	2
FR_LM2/2	18/09/2014 11:59	12.8	20.7	0.8	65.7	62.68	6	0.67	1013	0
FR_C0021	18/09/2014 11:39	25	25.2	0.1	49.7	49.32	9	-4.56	1015	0
FR_C0022	18/09/2014 14:03	33.8	26.6	1.7	37.9	31.47	7	-16.98	1017	0
FR_C0023	18/09/2014 14:06	47.5	33.3	0.1	19.1	18.72	21	-17.59	1009	100
FR_C0024	18/09/2014 11:43	34.6	22.4	8	35	4.76	6	-0.41	1009	0
FR_C0025	18/09/2014 11:45	29.5	27.1	0.2	43.2	42.44	11	-11.78	1013	0
FR_LCP03	18/09/2014 10:24	54.2	36.2	1.5	8.1	2.43	4	-3.91	1012	10
FR_LM3/1	18/09/2014 10:29	56.5	39.4	0.2	3.9	3.14	8	-0.63	1014	25
FR_C0031	18/09/2014 14:56	45	34.5	0.1	20.4	20.02	29	-17.37	1012	50
FR_C0032	18/09/2014 10:22	5.4	4	15.9	74.7	14.6	9	-0.2	1012	0
FR_C0033	18/09/2014 10:26	43.3	34	0.2	22.5	21.74	9	-3.04	1012	25
FR_C0034	18/09/2014 14:54	55.7	37.9	0	6.4	6.4	61	-19.13	1019	100
FR_C0035	18/09/2014 11:47	44.8	33.9	0.3	21	19.87	12	-14.42	1013	100
FR_C0036	18/09/2014 10:27	40.7	34	0.1	25.2	24.82	6	-2.66	1012	25
FR_LCP4A	18/09/2014 14:22	58.3	39.9	0.1	1.7	1.32	26	-16.23	1013	100
FR_LM4/2	18/09/2014 14:25	58.6	39.6	0	1.8	1.8	21	-16.64	1013	100
FR_C0041	18/09/2014 14:49	58.7	38.8	0	2.5	2.5	34	-18	1012	100
FR_C0041	18/09/2014 14:52	58.4	39.3	0	2.3	2.3	66	-17.9	1012	100
FR_C0042	18/09/2014 14:19	60.2	37.8	0	2	2	24	-16.17	1012	100
FR_C0043	18/09/2014 14:17	59.2	37.8	0	3	3	29	-15.78	1009	100
FR_C0044	18/09/2014 14:18	58.1	38.9	0	3	3	29	-15.8	1012	100
FR_C0045	18/09/2014 14:21	59.4	39	0	1.6	1.6	36	-15.73	1012	100
FR_LCP4B	18/09/2014 14:39	37.6	27.3	6.1	29	5.94	18	-17.18	1013	0
FR_C0051	18/09/2014 14:47	57.9	39.6	0	2.5	2.5	77	-18.04	1012	100
FR_C0052	18/09/2014 14:45	57.7	40.2	0	2.1	2.1	55	-17.44	1012	100
FR_C0053	18/09/2014 14:23	58.7	40.2	0	1.1	1.1	101	-16.53	1013	100
FR_C0054	18/09/2014 14:24	58.2	40.6	0	1.2	1.2	50	-16.38	1013	100
FR_C0055	18/09/2014 14:32	59.1	39.4	0	1.5	1.5	30	-17.11	1013	100
FR_C0056	18/09/2014 14:41	56.9	38.4	0.1	4.6	4.22	100	-18.05	1013	100
FR_C0057	18/09/2014 14:44	57.7	40.1	0	2.2	2.2	145	-17.63	1013	100

Appendix H
Meteorological Data

3 Pages

MONTHLY CLIMATOLOGICAL SUMMARY for JUL. 2014

NAME: FFRIDD RASUS CITY: STATE:
ELEV: LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1												
2												
3												
4												
5												
6												
7	15.2	17.8	14:30	10.8	5:00	2.9	0.0	0.0	2.3	15.0	11:30	N
8	14.7	18.2	16:00	10.1	23:30	3.7	0.0	0.5	4.9	22.0	13:30	N
9	15.4	19.3	17:00	10.9	2:00	3.0	0.1	0.0	8.9	25.0	14:00	NW
10	15.8	21.2	16:00	8.5	4:00	3.1	0.5	0.0	3.9	19.0	16:00	WSW
11	16.6	21.2	15:00	11.0	3:30	2.3	0.5	0.0	3.1	14.0	11:00	N
12	16.9	19.3	10:00	14.8	0:30	1.5	0.1	2.5	3.7	19.0	12:00	N
13	15.8	18.6	15:30	11.4	23:00	2.6	0.0	2.0	9.0	27.0	12:00	WNW
14	15.7	17.8	11:30	9.7	3:30	2.7	0.0	1.8	7.3	30.0	17:30	N
15	16.4	19.7	13:30	12.5	23:00	2.1	0.2	0.0	4.3	16.0	4:00	N
16	17.0	18.9	15:30	13.9	0:30	1.4	0.1	1.8	6.5	22.0	14:00	N
17	19.5	24.8	17:30	13.0	5:00	0.9	2.1	0.0	4.3	24.0	22:30	N
18	21.6	25.9	12:00	16.5	23:30	0.2	3.4	0.0	7.1	32.0	7:00	N
19	17.5	19.5	13:30	15.2	23:30	1.1	0.2	5.8	1.1	10.0	8:30	SSW
20	18.1	21.0	16:00	14.7	2:00	0.9	0.8	0.0	4.7	21.0	17:30	WSW
21	17.7	22.3	13:00	12.3	5:00	1.7	1.1	0.0	2.6	14.0	14:30	N
22	19.5	24.9	15:00	14.1	1:30	0.9	2.1	0.0	2.2	12.0	12:30	N
23	23.2	28.4	15:30	15.9	0:30	0.1	5.0	0.0	6.5	27.0	22:00	N
24	23.9	28.4	16:00	19.9	4:30	0.0	5.6	0.0	8.2	27.0	3:00	NNE
25	23.4	27.9	15:00	18.7	4:30	0.0	5.1	0.0	7.0	19.0	4:30	NNE
26	19.9	23.6	15:00	16.0	5:00	0.4	2.1	0.8	2.6	15.0	17:30	N
27	16.7	20.9	14:30	12.1	5:00	2.0	0.4	1.8	5.1	20.0	10:00	W
28	17.7	22.3	17:00	12.7	23:30	1.7	1.1	2.3	4.2	20.0	15:00	NW
29	15.8	20.4	16:30	10.5	3:30	2.7	0.2	0.8	4.5	21.0	16:30	WNW
30	17.2	19.7	15:30	13.2	3:30	1.3	0.1	0.0	4.7	17.0	15:00	SW
31	17.9	18.9	11:30	16.6	13:00	0.5	0.1	0.8	5.2	22.0	22:30	N
	18.0	28.4	23	8.5	10	39.4	30.4	20.8	5.0	32.0	18	N

Max >= 32.0: 0
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 5.84 ON 19/07/14
Days of Rain: 11 (> .2 mm) 4 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for AUG. 2014

NAME: FFRIDD RASUS CITY: STATE:
ELEV: LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	16.9	19.5	14:00	14.8	23:30	1.4	0.1	14.0	4.2	22.0	7:30	N
2	16.2	19.1	13:30	14.4	21:00	2.2	0.0	6.9	5.7	24.0	20:00	SW
3	16.4	18.8	12:00	12.4	00:00	1.9	0.0	0.0	9.1	30.0	17:00	N
4	15.5	20.9	16:00	9.1	5:00	3.3	0.6	0.0	2.2	13.0	13:00	ESE
5	17.1	20.8	13:00	11.4	2:00	1.7	0.5	5.1	2.4	22.0	12:00	N
6	17.9	20.2	14:30	15.4	00:00	0.7	0.3	1.3	5.4	20.0	2:00	N
7	16.3	19.6	13:00	11.3	00:00	2.2	0.2	0.0	3.1	15.0	12:00	N
8	17.0	21.0	12:00	11.7	0:30	2.1	0.8	0.0	2.4	13.0	12:00	WSW
9	15.7	19.8	13:30	9.9	4:30	2.8	0.2	4.6	5.3	21.0	8:00	N
10	14.7	17.5	16:00	12.8	17:00	3.6	0.0	11.7	11.2	39.0	17:00	W
11	16.1	18.4	13:30	14.5	2:30	2.3	0.0	0.0	13.7	31.0	16:00	WSW
12	15.8	18.0	14:00	14.1	4:00	2.5	0.0	0.0	11.3	30.0	3:00	WSW
13	15.4	17.7	12:30	13.2	00:00	2.9	0.0	0.3	8.6	30.0	13:30	WNW
14	15.0	18.5	13:30	9.2	23:30	3.3	0.0	0.3	6.4	25.0	14:00	NW
15	13.8	18.8	15:30	7.9	5:30	4.5	0.0	0.3	4.8	26.0	15:30	WNW
16	14.9	16.6	10:30	9.6	3:30	3.4	0.0	0.0	7.7	26.0	23:00	WSW
17	15.2	18.2	14:00	13.4	4:00	3.1	0.0	1.0	15.0	33.0	14:30	W
18	14.1	16.8	14:30	11.4	21:30	4.3	0.0	1.8	13.8	33.0	10:00	NW
19	12.5	15.7	17:00	8.3	00:00	5.8	0.0	3.0	8.1	27.0	13:00	NW
20	11.3	16.1	17:30	7.2	3:30	7.0	0.0	1.5	4.2	24.0	9:30	E
21	13.6	15.7	14:00	9.6	0:30	4.8	0.0	7.1	7.6	29.0	20:00	WSW
22	13.5	16.6	14:30	10.4	3:00	4.8	0.0	0.0	9.6	27.0	12:30	WNW
23	12.2	16.6	15:00	7.6	4:00	6.2	0.0	0.3	6.6	25.0	15:00	WNW
24	12.7	17.9	13:30	6.3	4:00	5.6	0.0	1.5	2.3	18.0	14:00	E
25	15.3	17.5	12:00	12.3	0:30	3.1	0.0	4.8	5.0	21.0	14:00	ENE
26	16.2	18.8	16:00	13.6	00:00	2.1	0.0	0.0	7.8	30.0	22:30	ENE
27	16.4	19.2	15:00	12.2	6:00	2.0	0.1	0.0	10.4	33.0	13:30	ESE
28	16.8	19.2	14:30	13.9	9:30	1.6	0.1	1.8	8.3	32.0	23:00	N
29	16.0	16.6	10:30	15.2	3:30	2.3	0.0	2.3	10.7	32.0	6:00	SW
30	15.4	17.1	16:30	13.5	2:00	2.9	0.0	1.8	7.3	22.0	2:30	WSW
31	15.7	17.8	13:30	13.3	6:00	2.6	0.0	2.3	5.6	19.0	0:30	N
	15.2	21.0	8	6.3	24	99.2	2.8	73.4	7.3	39.0	10	N

Max >= 32.0: 0
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 13.97 ON 01/08/14
Days of Rain: 21 (> .2 mm) 10 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for SEP. 2014

NAME: FFRIDD RASUS CITY: STATE:
ELEV: LAT: LONG:

TEMPERATURE (°C), RAIN (mm), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	15.0	18.5	15:30	9.4	22:30	3.3	0.0	3.6	5.6	25.0	12:30	NW
2	15.4	20.6	13:30	8.6	1:30	3.4	0.6	0.0	2.4	14.0	15:00	ENE
3	18.0	22.8	14:30	11.7	3:00	1.5	1.2	0.0	2.0	11.0	11:30	E
4	18.6	22.6	11:30	12.8	00:00	1.1	1.3	0.0	2.4	14.0	14:30	E
5	16.1	20.8	14:30	10.3	6:00	2.8	0.6	0.0	1.7	11.0	13:30	E
6	14.3	18.6	13:30	7.6	00:00	4.1	0.0	0.0	4.6	23.0	15:30	NNE
7	12.3	19.2	15:30	5.4	5:30	6.1	0.1	0.3	2.6	15.0	13:30	E
8	12.7	19.6	14:30	5.6	5:30	5.7	0.1	0.0	3.8	18.0	14:30	NNE
9	14.4	19.5	15:30	9.7	3:00	4.0	0.1	0.0	2.9	13.0	12:30	WSW
10	16.1	21.4	16:30	10.2	4:00	3.0	0.7	0.0	1.6	12.0	11:30	NE
11	15.6	21.1	16:30	10.3	6:30	3.2	0.5	0.0	2.1	12.0	11:00	E
12	15.3	19.2	16:00	10.1	4:30	3.2	0.1	0.0	2.3	16.0	10:00	E
13	17.4	20.8	13:30	14.8	21:00	1.3	0.4	0.0	4.3	19.0	00:00	NNE
14	16.2	19.4	15:30	13.2	5:30	2.2	0.2	0.0	7.4	27.0	21:30	ENE
15	15.9	19.5	14:00	12.0	6:30	2.6	0.2	0.0	4.8	29.0	0:30	NNE
16	18.9	23.1	15:00	14.4	7:00	0.8	1.3	0.0	5.5	25.0	21:00	NNE
17	18.7	23.1	14:30	15.8	23:30	0.8	1.1	0.0	7.0	26.0	9:30	NE
18	19.8	24.9	13:30	15.4	4:00	0.8	2.3	0.3	6.3	21.0	22:00	NNE
19	18.6	21.7	11:30	15.2	22:00	0.6	0.9	0.5	3.6	16.0	1:00	NNE
20	15.9	18.1	15:30	12.6	23:30	2.4	0.0	0.0	3.4	15.0	11:30	NNE
21	14.5	20.2	12:30	8.5	00:00	4.2	0.3	0.0	3.0	13.0	13:00	NE
22	13.5	18.6	15:30	7.2	3:00	4.8	0.0	0.0	2.9	14.0	00:00	E
23	15.2	18.1	12:30	12.8	1:00	3.1	0.0	2.5	6.0	22.0	17:00	WSW
24	13.3	16.4	15:00	8.7	21:00	5.0	0.0	1.5	8.5	25.0	11:30	WNW
25	14.9	16.7	15:30	8.3	2:00	3.4	0.0	0.5	5.5	22.0	10:30	SW
26	14.9	19.1	12:30	8.2	00:00	3.4	0.1	0.0	6.3	22.0	10:30	WSW
27	13.7	17.5	14:30	8.3	0:30	4.7	0.0	0.5	2.0	14.0	9:30	E
28	15.8	19.7	14:00	9.9	00:00	2.7	0.2	0.0	2.1	14.0	12:00	WSW
29	13.6	17.7	12:00	9.4	5:00	4.8	0.0	0.5	0.9	9.0	00:00	ESE
30	16.7	19.6	12:30	14.7	23:30	1.8	0.1	2.5	7.6	25.0	16:00	N
	15.7	24.9	18	5.4	7	90.9	12.3	12.7	4.0	29.0	15	E

Max >= 32.0: 0
Max <= 0.0: 0
Min <= 0.0: 0
Min <= -18.0: 0
Max Rain: 3.56 ON 01/09/14
Days of Rain: 10 (> .2 mm) 3 (> 2 mm) 0 (> 20 mm)
Heat Base: 18.3 Cool Base: 18.3 Method: Integration