Silliot Hill Integrated Waste Management Facility
Kilcullen, Co. Kildare.

Waste Licence Ref: W0014-01

Annual Environmental Report - 2009

Original

Prepared by:
Kildare County Council,
Aras Chill Dara,
Devoy Park,
Naas,
Co. Kildare.

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1. Introduction

On the 17th May 2002 the Environmental Protection Agency issued a waste licence to Kildare County Council for their integrated waste management facility at Silliot Hill, Kilcullen, Co, Kildare. The waste licence reference number is W0014-01. This report fulfils Condition 11.6 of the waste licence for the facility, which states that

"Within six months of the date of the grant of this licence, the licensee shall:

i) Submit to the Agency for its agreement, by 31st December 2002 and within one month of the end of each year thereafter, an Annual Environmental Report (AER).

ii) The AER shall include as a minimum the information specified in Schedule G: Content of Annual Environmental Report of this licence and shall be prepared in accordance with any relevant written guidance issued by the Agency."

This report addresses the items listed in Schedule G (Content of the Annual Environmental Report) of the waste licence for the facility. This AER covers the reporting period from 1st January 2009 up to 31st December 2009.

2. Site Description and Activities

2.1. Waste Activities carried out at the Facility

Waste activities at Silliot Hill Integrated Waste Management Facility (IWMF) are restricted to those outlined in Part 1 – Activities Licensed of the waste licence.

County Council vehicles, private contractors and members of the public access the facility. In summary, the site is divided into three active areas; the waste transfer station (WTS), the civic amenity facility (CA) and in-vessel composting area. The landfill and sludge treatment facility (STF) make up the fourth and fifth components. The activities carried out at each area are described in the subsections below.

2.1.1. Waste Transfer Station

The waste transfer station commenced operation in 2001. Construction of the enclosure of this transfer station commenced in October 2005 and was completed in June 2006. The facility is currently in use. It comprises an open floor area where vehicles enter from the east of the enclosure and deposit waste material in dedicated areas with bunker walls.

These dedicated areas in the WTS collect timber, bulky material, green material and metal. All mixed municipal waste is deposited in a single area.

There is a shredder in the WTS. Green waste is shredded on-site and stockpiled for disposal off-site. Timber waste is also shredded on-site and stockpiled until removal off-site. Bulky waste is shredded on-site and mixed with municipal waste prior to off-site disposal.

Members of the public are not permitted in the transfer station area.

2.1.2. Civic Amenity Facility

The activities in the civic amenity facility are licensed under Classes 3, 4 and 13 of the Fourth Schedule of the Waste management Act 1996. The operation of the CA is described as follows:

Recycling, baling and shredding of paper, cardboard and plastic takes place in a building at the north of the site. A hard standing area has been provided for the storage of these materials prior to their packaging within the building.

Adjacent to the site access road, a concrete hard-standing area is used for the deposition, collection and handling of bulky goods including green waste, white goods, glass and tyres. An area for the storage of household hazardous waste is located adjacent to this area. Members of the public can deposit waste at a designated area provided at the CA.

A charge for household recyclables was introduced in January 2009. This is tolled at a standard rate per volume. Household electronic goods are disposed of free of charge under the WEEE Regulations. Commercial white goods are charged. Bulky recyclables are tolled at a reduced rate. These items include tyres and scrap metal. Residual waste taken to the transfer station is charged at full toll.

Construction of the redesigned CA commenced in August 2005 and was completed in mid-2006. The facility was opened to the public in February 2007.

2.1.3. Greenstar In-Vessel Composting Area

Kildare County Council entered into a contract with SITA Recycling Ltd (now Greenstar) for the operation of a pilot in-vessel composting facility. These activities are licensed under Classes 6, 7 and 13 of the Third Schedule and Classes 2, 10, 11 and 13 of the Fourth Schedule of the Waste Management Act, 1996. The system was brought to site in April 2002 and was located adjacent to the WTS. The pilot in-vessel composting unit was relocated in September 2004 to a dedicated area including a composting building and yard area. The building and yard were completed in September 2004 and the newly located system was subsequently commissioned.

The technology used in the vertical compost units (VCUs) is of modular construction. There are four units installed at Silliot Hill, each with a capacity of 25m^3, giving a total capacity of 100 m^3. Each module can be operated and monitored independently of the others. With a 14 day cycle, the units can process 115 tonnes of food waste in that period (or 3,000 tonnes of food waste per annum).

Currently, this composting facility is not in operation and has not been functioning since 2007. As such, no results are reported here.

2.1.4. Old Landfill Site

The landfill site is located in an area previously used as a sand and gravel quarry. Landfilling operations ceased at the site in March 2002 following the commissioning of the WTS. Landfilling commenced in the early 1980s with the opening of a "dilute and disperse" type landfill (referred to as Phase 1).

Phase 1 covers an area of approximately 79,000m^2. Waste thickness is approximately 18m. Lined cells were constructed in 1997 (referred to as Phase 2). Phase 2 covers an area of approximately 24,000 m^2. Waste thickness in Phase 2 is also approximately 18m.

Phase 1 was capped in 1997/1998 with over 1m of low permeability clay and 300mm of topsoil. The Phase 1 area is divided into Phase 1a (the largest area to the east of the WTS) and Phase 1b (the isolated area to the north of the transfer station).

Phase 1a was generally found to have a significant clay cap, and the EPA agreed that this cap provides adequate protection to groundwater provided that localised areas receive augmented clay capping material and grading to control surface water run-off. Re-grading and augmentation of the clay cap and installation of gas and leachate infrastructure, and other associated infrastructure, was completed during 2008. 47 No. 1m diameter wells were installed during 2008 throughout Phase 1a and Phase 2 and connected into the facility's gas extraction system to improve gas capture.

Phase 1b received a fully engineered capping system inclusive of an integrated landfill gas extraction infrastructure. This was completed in early 2008.

Construction of a fully engineered capping system commenced in Phase 2 in mid 2008. This includes landfill gas and leachate collection infrastructure. The work was completed in June 2009.

Activities at the landfill area are now limited to the collection of landfill gas, the collection of leachate and the monitoring of environmental media.

2.1.5. Sludge Treatment Facility

The sludge treatment facility has ceased the intake of sludge since November 2002. The facility was constructed for the composting of stabilised sludge from Osberstown and Leixlip WWTPs.

Planning permission was granted to TEG Environmental in 2005 for the composting of food waste at the facility. This composting facility is complete but not being used at present. There is no commitment from the operators to return to the facility.

3. Waste Quantities and Composition

The quantity and composition of material received for recovery at the facility from 2000 to the end of the 2009 reporting period is outlined in Table 3.1.

Table 3.1: Summary of Recyclables Recovered (Tonnes) from Facility (2000-2009)

Material	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Shredded Greens	103.49	58.23	72.2	29.48	--	--	--	--	339.34	299.56
Scrap Metal	653.96	392.9	472.9	448.31	522.94	428.48	570.88	427	415.54	314.6
Bottles	16.08	15.5	46.01	69.26	93.31	108.83	107.16	109	112.58	71.98
Cans	--	--	--	8.54	16.38	14.68	12.42	9.428	3.62	18.6
Batteries	4.55	7.8	12.1	17.27	19.46	21.9	21.9	25.28	16.94	14.88
Glass Flat	4.32	19.26	8.09	30.79	45.43	38.11	30.84	27	15.86	15.16
Cardboard	168.74	158.37	187.99	216.91	294.5	297.5	274.58	349	278.66	221.7
Newsprint	47.01	51	39.57	125.71	153.17	135.2	115.76	129	128.36	82.42
Shredded Paper	--	--	--	237.77	133.83	120.5	114.14	30	41.56	44.7
Waste Oil & Filters	3.91	1.9	3.5	6.28	6.37	5.77	7.38	4	2.86	0
Electrical Goods	0.22	63.86	201.55	303.17	306.12	424.04	433.8	320.487	458.88	370.48
Gas Bottles	2.03	0.1	0.69	7.92	3.02	3.62	1.4	0	1.08	0.58
Clothes	4.61	--	4.28	7.74	10.46	17.69	31.64	46	47.22	26.36
Household Hazardous	--	--	--	12.93	23.96	24.44	30.18	36.28	29.76	18.74
Plastics	--	--	--	20.72	47.79	55.21	41.66	19	27.66	26.92
Ink Cartridges	--	--	--	0.04	--	--	0	0	0	--
Tyres	0.71	--	--	--	4.9	15.01	0	8.28	19.53	7.24
Fluorescent Tubes	--	--	--	--	--	--	0.38	0.28	0.34	0.56
Polystyrene	--	--	--	--	--	--	--	--	2.52	0.84
Gypsum	--	--	--	--	--	--	8.64	20.6	14.18	23.92
Totals	**1,009.63**	**738.92**	**1,048.88**	**1,542.84**	**1,681.64**	**1,710.98**	**1,793.74**	**1,560.653**	**1,956.48**	**1,656.26**

Table 3.2: Summary of Waste Recovered and Disposed (Tonnes) from Silliot Hill WTS 2009

Waste Type	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	TOTALS
Green Waste Out	0	22.82	24.06	44.58	37.6	24.36	42.54	24.06	0	44.64		34.9	**299.56**
Scrap Metal	32.14	20.82	27.36	38.02	25	34.44	30.36	21.34	29.98	4.92	24.72	25.5	**314.6**
Bottles	6.12	6.94	5.18	10.28	0	6.62	6.32	6.66	6.04	6.22	5.88	5.72	**71.98**
Waste Oil	0	0	1.42	0	0.18	1	0		0.92				**3.52**
Batteries	1.44	1.36	0	2.32	0.56	0.94	0.42	2.5		1.94	2.44	0.96	**14.88**
Shredded Bulk							134.94	110.02	129.54	46.9	57.96	105.88	**585.24**
Fluorescent Tubes	0	0.18	0	0.24	0	0	0				0.14		**0.56**
Tyres	0	0	0	0	0	7.24	0						**7.24**
Gas Bottles	0	0	0	0	0	0	0		0.58				**0.58**
Clothes	4.12	2.42	1.72	2.2	1.4	1.94	2.56	2.54	1.78	2.38	1.6	1.7	**26.36**
Flat Glass	0	0	0	8.72	0	0	2.76		1.92	1.76			**15.16**
Shredded Paper	6.66	0	4.86	3.88	0	5.76	5.5		8.34			9.7	**44.7**
Cans	0	0	0	0	0	0	0			18.6			**18.6**
Polystyrene	0	0.84	0	0	0	0	0						**0.84**
Plastics	0	0	0	0	0	0	0			8.6		18.32	**26.92**
Electrical	36.44	27.42	22.54	41.44	30.26	40.58	31.26	31.26	26.78	31.9	21.8	28.8	**370.48**
Household Haz.	2.54	0	1.24	3.38	0	2.52	1.92	2.08	2.5	1.9		0.66	**18.74**
Gypsum	3.8	0	2.12	2.3	0	3	4.48	1.94		2.16	4.12		**23.92**
Cardboard	29.02	12.14	19.06	11.78	26.56	17.5	22.48	17.82	8.38	27.54	12.74	16.68	**221.7**
Leachate	725.54	451.00	279.58	186.68	315.46								**1958.26**
Newsprint	4.5	10.98	5.62	5.76	5.12	10.82	6.14	10.16	5.6	5.68	5.78	6.26	**82.42**
Compost	0	0	0	0	0	0	0						**0**
Waste Cooking Oil	0	0	0	0	0	0	0						**0**
Waste to Baling Station	2158.74	1658.50	1906.4	1972.50	1847.80	1740.52	1566.58	1547.2	1732.66	1685.4	1518.64	1318.74	**20653.68**
Waste Direct to Thorntons													**0**
Timber	9.1			7.64				11.9	8.74	9.58	7.1	30.28	**84.34**
Tetrapak													**0**
TOTALS	**3011.06**	**2215.42**	**2301.16**	**2334.08**	**2289.94**	**1897.24**	**1858.26**	**1777.58**	**1955.02**	**1890.54**	**1655.82**	**1573.82**	**24759.94**

Tables 3.1 and 3.2, above, outline the trends for recovery of recyclables during the period 2000 to 2009. The total for 2009 shows a decrease in overall material handled from the previous year (mainly influenced by WEEE, scrap metal, cardboard and clothing decreases)

As of June 2008 bulky waste is shredded onsite and disposed off with the mixed waste.

There was no waste delivered to the Greenstar In-Vessel composting facility during the reporting period. The composting facility was closed down by the Department of Agriculture and will remain closed for the foreseeable future.

All waste quantities handled at each of the areas are within the tonnages licensed for Silliot Hill.

4. Settlement and Slope Stability

4.1. Settlement

As documented in previous AERs, annual topographical surveys carried out since the granting of the waste licence indicate that Phase 1 has stabilised (i.e. little or no settlement is occurring).

In Phase 2, the 15-month interval between surveys in July 2005 and October 2006 the average annual settlement rate was recorded as 190 mm/year. This represented a decrease in the settlement level experienced at Phase 2 in 2005 which was estimated at 530 mm.

In preparation for the capping of Phase 2 and its respective gas extraction infrastructure a surcharge of clay material was installed early 2007. The purpose of the surcharge was to accelerate onsite consolidation facilitating installation of the capping works. As a result of the extensive works carried out on Phase 2 and the change in topological profile accurate settlement comparisons are not possible. A base-line topographical survey has been completed to enable settlement calculations at year end.

4.2. Slope Stability

A slope stability analysis was conducted for the site by Golders Associates. Their report concluded that the slopes surrounding the transfer station are not showing signs of deterioration. This coupled with the detailed assessment undertaken by Fehily, Timoney & Co. in 2009 means that the slopes are stable. The report on the slope stability assessment in included in Appendix V.

5. Summary of Environmental Monitoring

Condition 8 and Schedule D of the waste licence specifies the environmental monitoring requirements of the facility. Conditions 8.5 to 8.11 list the parameters to be monitored. The following sections discuss the results from the four quarterly monitoring and annual monitoring events during the reporting period.

5.1. Landfill Gas

The licence requires that the licensee conduct monthly monitoring in the gas wells in order to detect off-site gas migration and weekly monitoring in site buildings in order to detect accumulation of landfill gas. The gas is monitored using a "GFM420" or "GA94" automatic infra-red analyser/electrochemical cell which detect atmospheric pressure and levels of carbon dioxide, methane and oxygen.

The location of the monitoring positions is shown on Drawing 2001-114-01-003-RevD, contained in Appendix I. The monitoring results for 2009 are attached in Appendix II.

5.1.1. Interpretation of Results

Site Buildings

Gas concentrations in the site buildings are monitored on a weekly basis. To date methane and carbon dioxide readings have been zero. Oxygen has been recorded at normal levels. Weekly monitoring log sheets are maintained at the site office. Automatic gas detection/alarm systems were installed in the site offices in November 2003. No incidences have been recorded.

Gas Boreholes and Wells

Lateral migration of landfill gas at Silliot Hill has been recorded since late 1997, following the capping of Phase 1 (the unlined portion of the landfill). Gas migration was brought under control by the installation of an active gas extraction system in 1998. The gas collected was used to fuel two open flare systems until November 2003. An enclosed flare which had been installed as part of the new landfill gas management programme was then brought on line and the two open flares decommissioned. This enclosed flare received gas from the perimeter of the landfill. In March 2004 the landfill gas utilisation plant was put into operation to receive the gas from the core of the landfill. No gas was flared in 2008 owing to the onsite construction works. Flaring recommenced in June 2009 following completion of the new gas collection infrastructure.

A number of new perimeter gas wells were bored and installed around the site during 2007 to replace some of the older existing wells which have been identified as performing poorly and some other wells that have been damaged during construction works onsite. Permission to start monitoring these wells was granted by the Agency in June 2008.

During the 2009 reporting period the area of significance was along the southern boundary of the site. Gas levels above the trigger level were most prevalent along this boundary of the landfill. Persistent raised methane levels have been recorded at the TEG building and close to the entrance to KTK landfill at G103, G104D, G104S, G105 and G106D. Carbon dioxide exceedences were also prevalent in these wells.

Patterns of gas migration have improved since the recommencement of flaring in the middle of 2009. A landfill gas balancing model commissioned from Fehily, Timoney and Co was received at the end of 2009. It is hoped that the use of this tool will fine tune the gas management and continue the downward trend of exceedences.

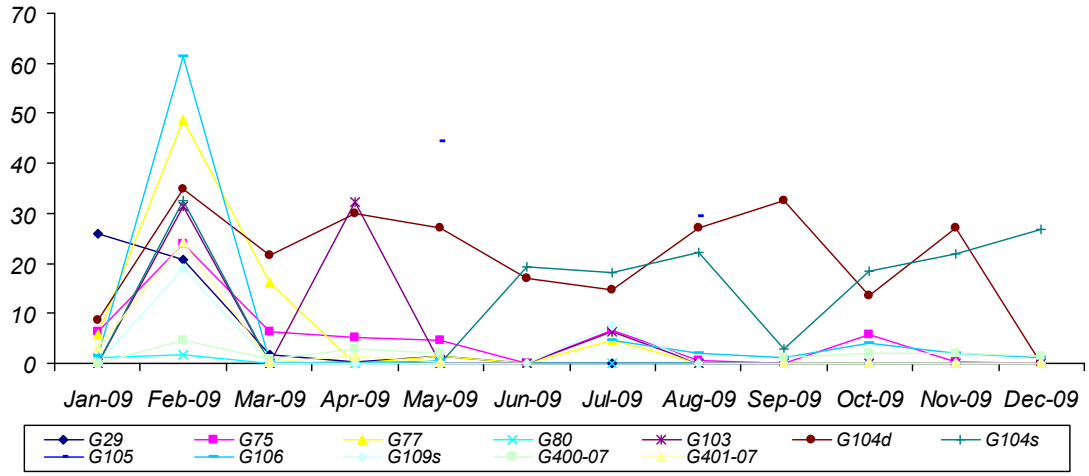


Figure 5.1. Perimeter Gas Wells Exceeding Methane Trigger Level (2009)

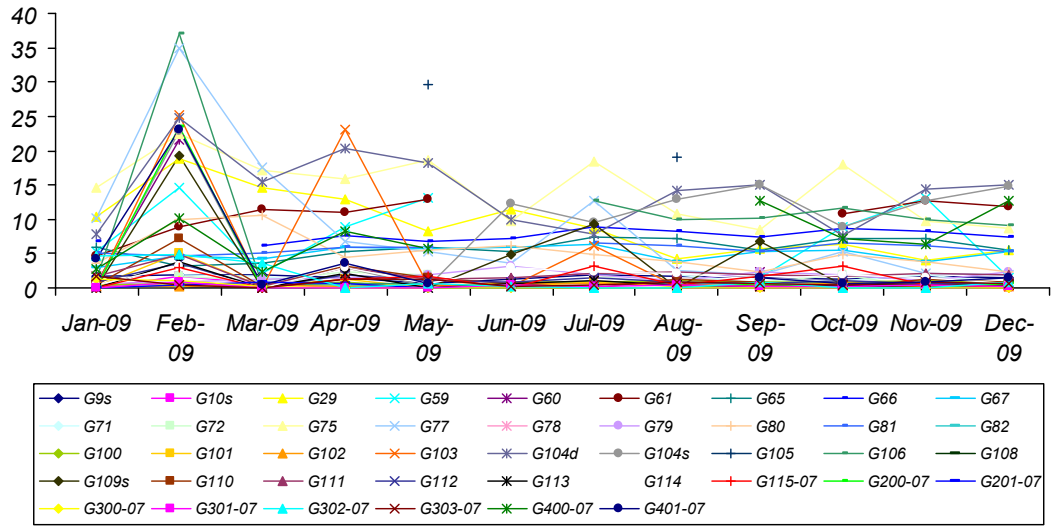


Figure 5.2. Carbon dioxide Readings in Perimeter Gas Wells (2009)

5.2. Surface Water

Surface water monitoring was carried out at the seven locations (SW1 to SW7) as outlined in Table 5.1 and shown on Drawing 2001-114-01-003, Rev D. SW5 was found to be dry during every site visit in 2009. The results of the monitoring are presented in Appendix II.

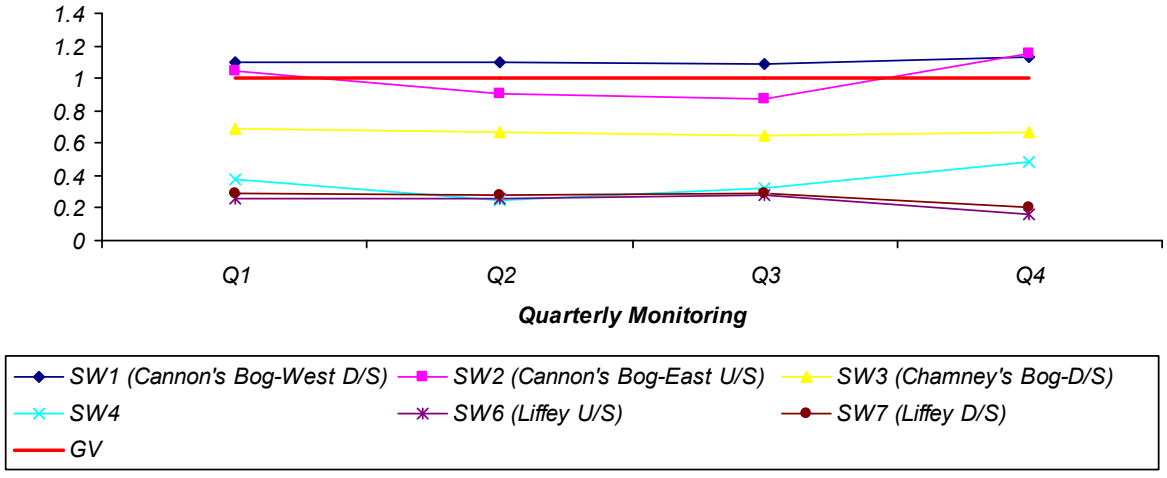
Table 5.1. Surface Water Monitoring Locations

Station	Easting	Northing	Location
SW1	285216	210323	Westerly drain from Cannon's Bog
SW2	285368	210422	Drain downgradient of SW5
SW3	285835	210674	Drain downgradient of SW4
SW4	285789	211010	Drain nearest the site – 200m
SW5	285444	210963	Drain near the site – 250m
SW6	285690	210079	Upgradient – R. Liffey
SW7	285278	210178	Downgradient – R. Liffey

5.2.1. Interpretation of Results

The surface water results have been compared to limits as outlined in the Surface Water regulations, 1989, for comparative purposes only. It can be seen from the results that over the course of the year, several parameters were above the trigger level as specified in the regulations.

SW1 and SW2 have higher indicator values than the other sites. Three of these parameters, conductivity, chloride and Ammonia, are plotted for quarterly data in Figures 5.3, 5.4, and 5.5 respectively. These parameters were chosen because they are indicators of Leachate impact, but they may also demonstrate impact from other sources, such as sewage or industrial effluent.

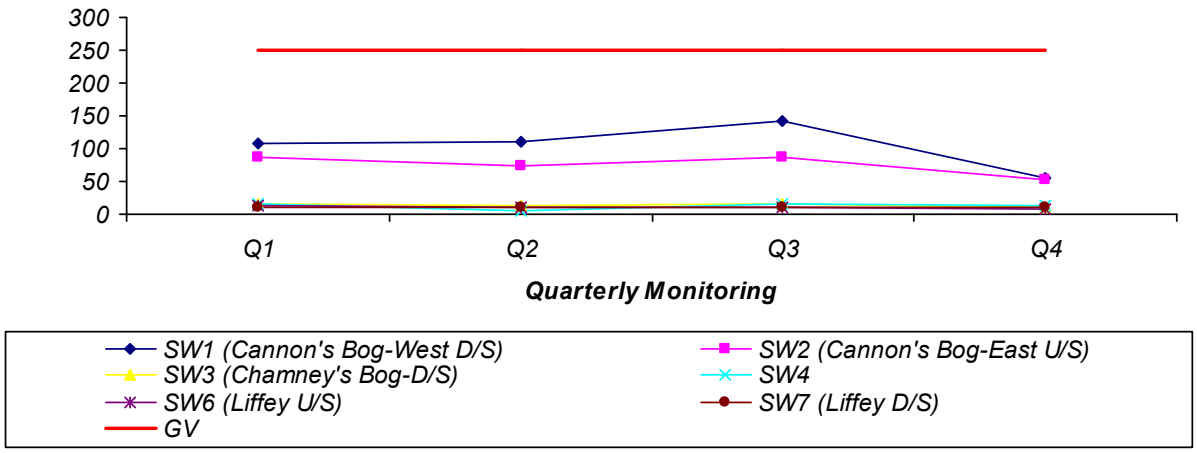


Note: U/S – upstream, D/S – downstream

Figure 5.3. Conductivity at Surface Water Monitoring Points (2009)

The above graph indicates a possible impact from the landfill on SW1 and SW2. However, these surface water channels are known to receive inputs from an industrial estate outside Kilcullen, which is upstream of the landfill and

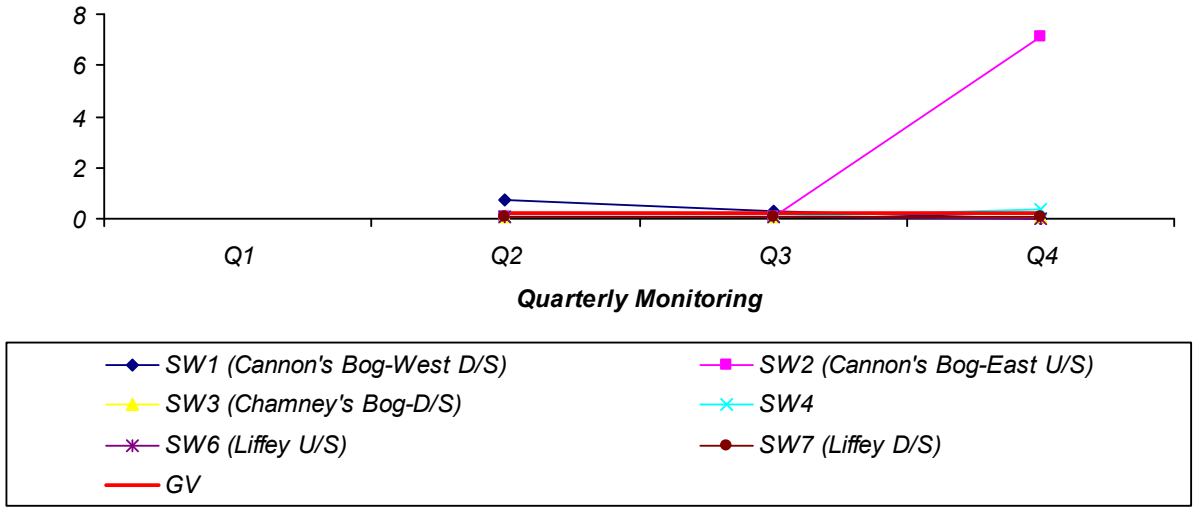
thus may have contributed to the water quality downstream. There is no discernable deterioration of the River Liffey at the downstream monitoring point, SW7.



Note: U/S – upstream, D/S – downstream

Figure 5.4. Chloride at Surface Water Monitoring Points (2009)

It is likely that the elevated levels of chloride are caused by the same sources as those causing the high conductivity levels. It should be noted that chloride levels at all sites were below the trigger limit of 250 mg/l Cl



Note: U/S – upstream, D/S – downstream
Where samples were below limit of detection, half the detection limit was used to plot the graph

Figure 5.5. Ammonia at Surface Water Monitoring Points (2009)

Ammonia levels in SW1 were elevated throughout the year, but dropped below the trigger level of 0.23 mg/l N in Quarter 4. Ammonia levels were below the trigger level at all other sites throughout the year apart from Q4 when there was an increase at SW2 and SW4. SW2 is upstream of the landfill and therefore the cause is unlikely to be the landfill. The elevated levels may be a result of the flooding events in November. The cause of the increase in SW4 is unknown.

However, it should be noted that the neighbouring KTK Landfill reported an incident of a breach of Leachate containment in Q4. The KTK facility is located between the Silliot Hill facility and SW4.

5.3. Groundwater Quality

Groundwater monitoring is carried out at the locations outlined in Table 5.2. New monitoring infrastructure was approved in late 2008. Quarter one of 2009 was the first round of monitoring of the new infrastructure. This increased the number of groundwater wells from 18 to 19.

Table 5.2. Groundwater Monitoring Locations

Station	Easting	Northing	Location
BH 1	285832	211804	Upgradient
BH 2	286040	211673	Adjacent
BH 3	285591	211719	Adjacent
BH 4-07	285714	211459	Down Gradient
BH 9D	285797	211904	Upgradient
BH 10D	285422	211548	Down Gradient
BH 11D	285136	211307	Down Gradient
BH 13-07	285714	211459	Upgradient
BH 15-07	285795	211888	Upgradient - Dry
BH 16R-07	285909	211412	Down Gradient - Dry
KTK 20	285663	211082	Down Gradient
GWR 1	285198	210319	Down Gradient
GWR 2	285741	210609	Down Gradient
GWR 3	286187	210813	Down Gradient
PW 2-09	285769	212262	Upgradient
PW 4	285603	211798	Upgradient
PW 9	285940	210264	Down Gradient
PW 11	285495	210638	Down Gradient
PW 15	285663	211835	Upgradient - Dry

The groundwater monitoring locations are illustrated on Drawing 2001-114-01-003 Rev D (Appendix I). It should be noted that on all sampling occasions BH10D, BH15-07, BH16R, BH16R-07 and PW15 have been dry or had insufficient water to purge and sample.

5.3.1. Interpretation of Results

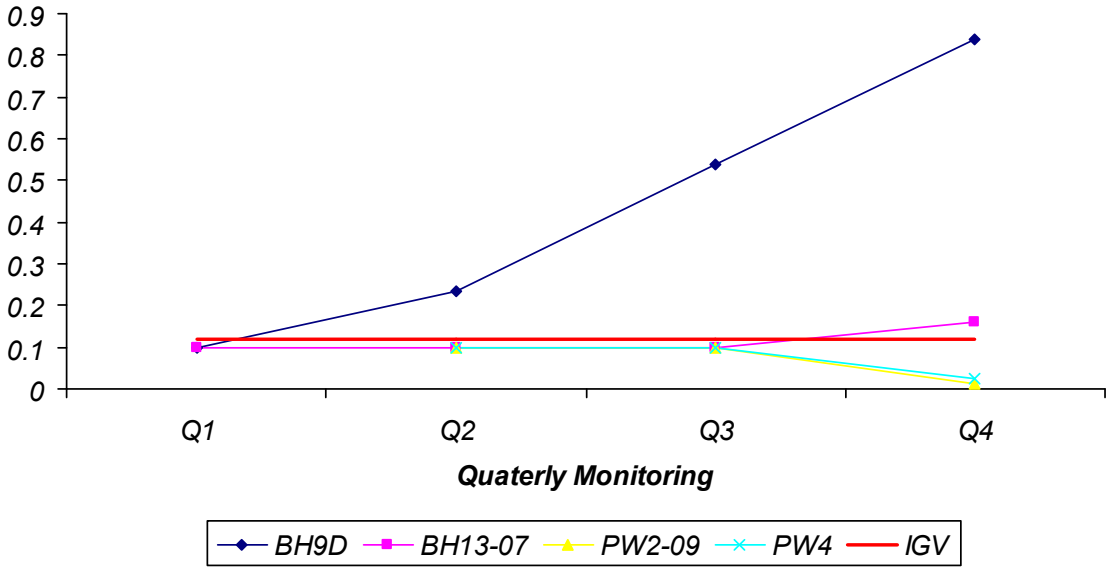
The groundwater results have been compared with the relevant Interim Guideline Value (IGV) set out in the EPA report 'Towards Setting Guideline Values for the Protection of Groundwater in Ireland'.

Groundwater upgradient of the site is impacted by agricultural and septic tank point sources as demonstrated by elevated total coliforms at all wells and faecal coilforms in BH9D, PW2-09 and PW4. Throughout the year Ammoniacal nitrogen and chloride at BH9D and PW2-09 substantiate this interpretation.

Groundwater beneath the landfill and directly downgradient of it shows impact from the unlined portion of the landfill. BH2, BH3 and BH4-07 all have elevated levels of ammoniacal nitrogen and total coliforms. BH4-07 has elevated levels of potassium, sodium and chloride also.

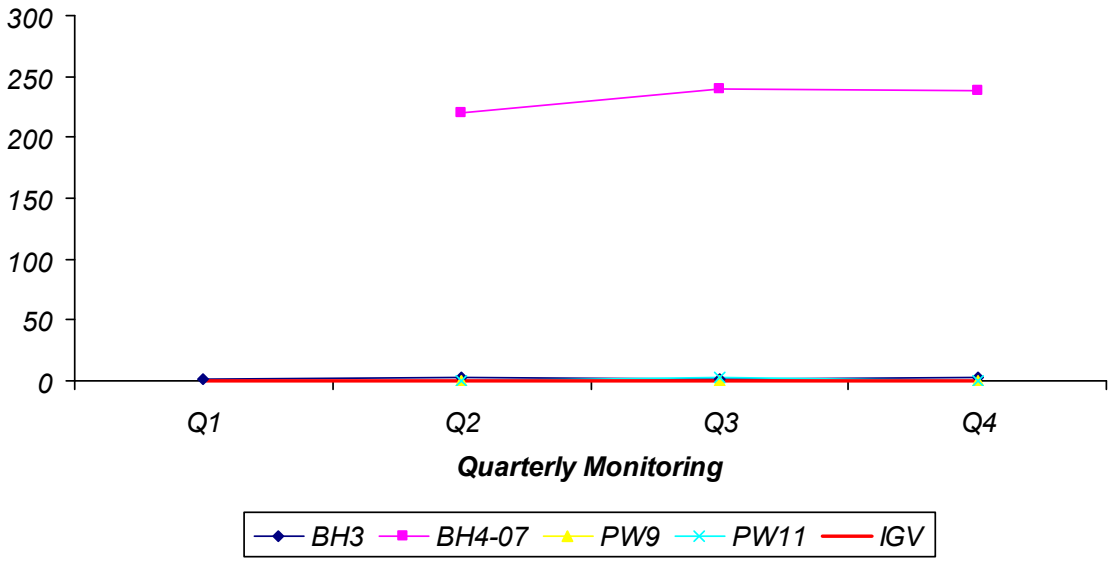
BH15-07, BH16R (and its replacement BH16R-07), PW15 and on occasion BH10D have had insufficient volumes of water for sampling. During the year sampling tubing has fallen down both BH1 and BH2 blocking them.

The contamination resulting from the unlined portion of the landfill does not extend a significant distance from the landfill as shown by the results for BH11D and KTK20 which are located greater than 100m south of the landfill.



Note: Where levels were below the limit of detection, half the limit of detection was used for plotting the graph

Figure 5.6. Ammoniacal Nitrogen Levels at Upgradient Groundwater Monitoring Points (Compared to Interim Guideline Value)



Note: Where levels were below the limit of detection, half the limit of detection was used for plotting the graph

Figure 5.7. Ammoniacal Nitrogen Levels at Downgradient Groundwater Monitoring Points (Compared to Interim Guideline Value)

None of the private wells down gradient of the facility appear to be affected by the landfill (see results for PW9 and PW11 in Appendix II). Though there are instances of high coliform counts and failure of other water quality standards, local sources of contamination (farmyards, septic tanks or poor wellhead protection) are believed to be the cause of this microbiological and physio-chemical contamination.

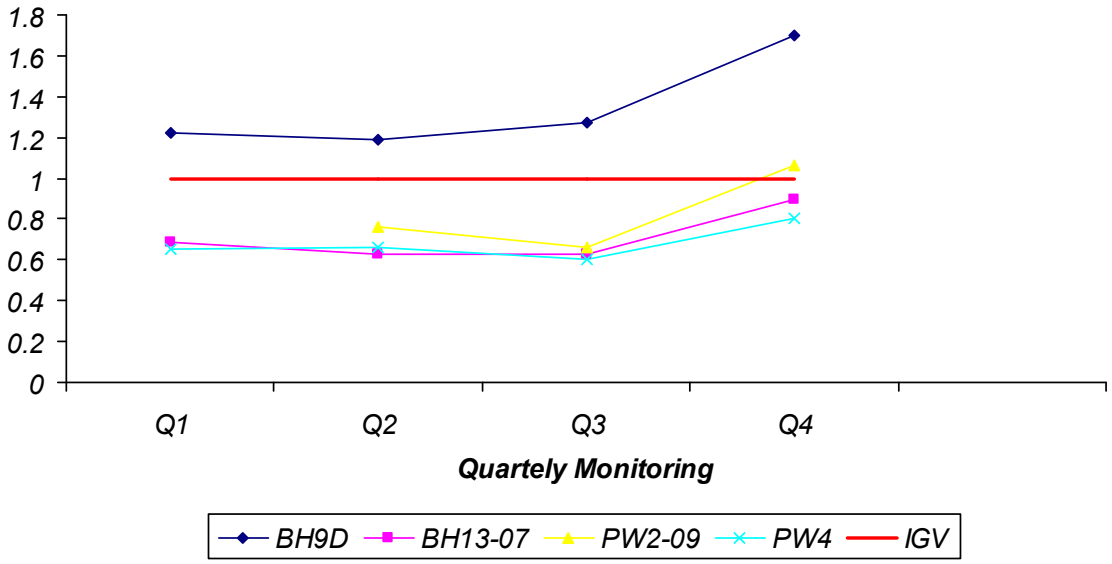


Figure 5.8. Conductivity Levels at Upgradient Groundwater Monitoring Points (Compared to Interim Guideline Value)

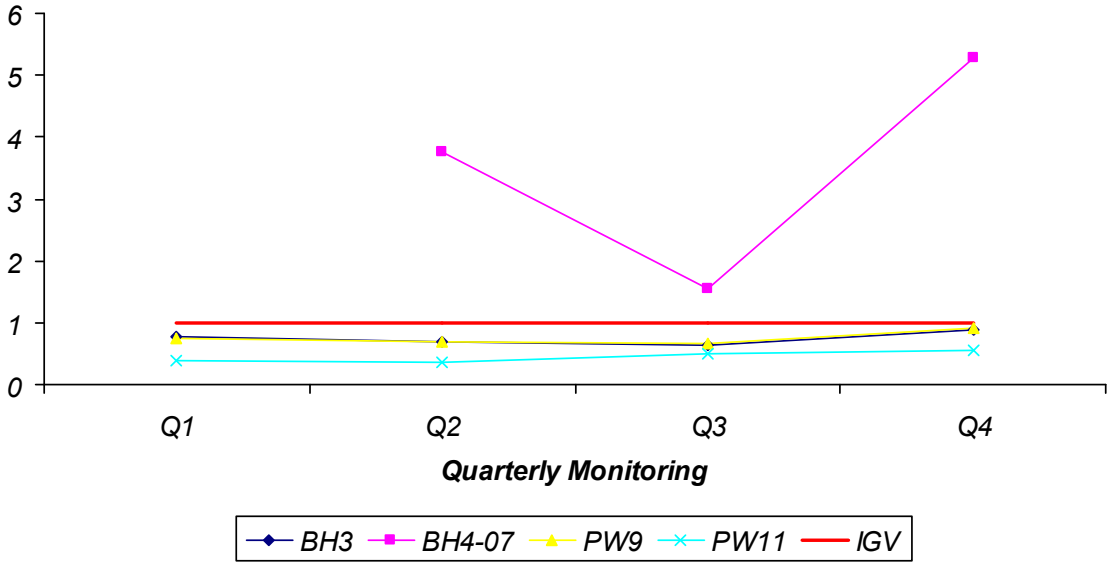


Figure 5.9. Conductivity Levels at Downgradient Groundwater Monitoring Points (Compared to Interim Guideline Value)

5.4. Leachate

Leachate monitoring is carried out at the six locations (L1 to L6) outlined in Table 5.3 and shown on Drawing 2001-114-01-003 (Rev D) in Appendix I. The results of the monitoring are presented in Appendix II

Table 5.3. Leachate Monitoring Locations

Location	Eastings	Northings
L1	285607	211587
L2	285775	211483
L3	285750	211685
L4	285717	211753
L5	285747	211664
L6	285834	211587

Leachate sumps L1 and L2 were inaccessible for most of the year owing to works related to the capping of Phase 2. Access was restored to these during Quarter 4 of 2009 allowing sampling and for levels to be taken. A sample could not be obtained from L2 at that time. L5 and L6 were damaged during the capping works and have become blocked. Therefore, a sample could not be obtained from either of these leachate sumps during 2009.

5.4.1. Interpretation of Results

Figure 5.9 shows the levels of conductivity measure at leachate wells throughout the year and these are typical concentrations for leachate

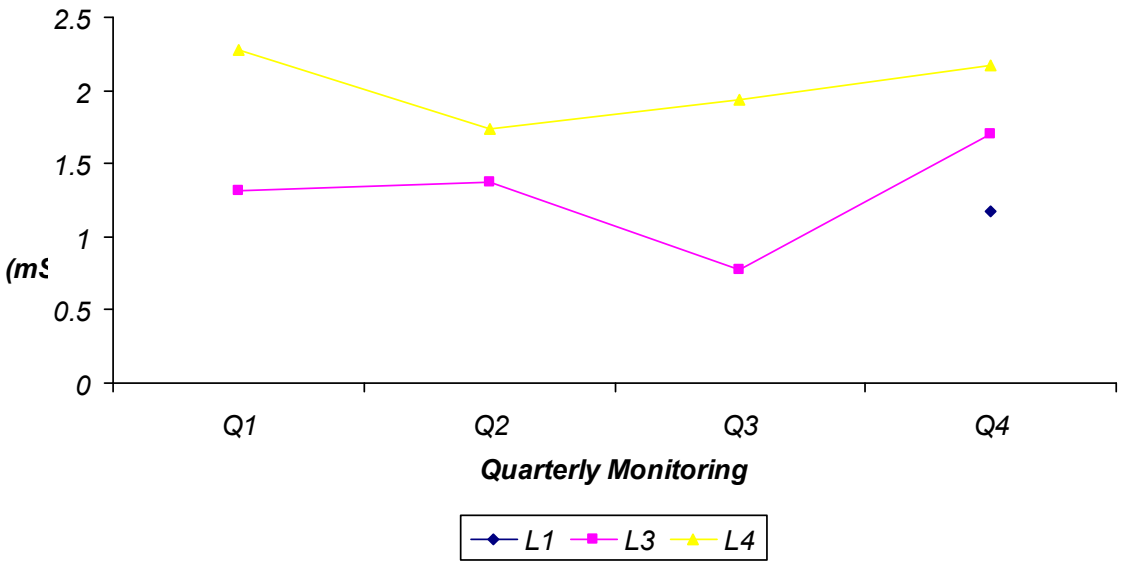


Figure 5.10. Conductivity Levels at Leachate Monitoring Points.

L3 and L4 are manholes that receive foul drainage from the hard-standing areas on-site and hence, have a chemistry similar to contaminated storm water rather than pure leachate. L3 also has a high total and faecal coliform count.

5.4.2. Leachate Level Results

Leachate levels are monitored on a weekly basis at L1 and L2, to assess the head of leachate above the liner at these locations. Condition 5.9.2 of the Waste Licence states that 'leachate levels in the waste shall not exceed a level of 1.0m over the top of the liner at the base of the landfill in Phase 2'. Access to L1 and L2 was restored at the end on November 2009. Figure 5.10 illustrates the weekly leachte levels at L1 and L2 from November to December 2009.

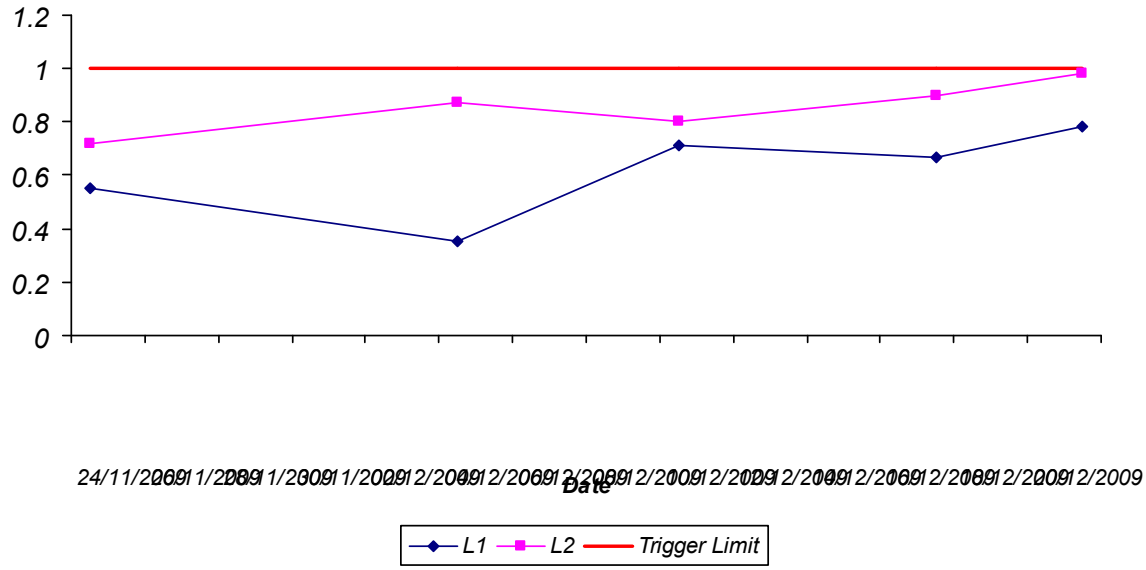


Figure 5.11. Leachate Levels at L1 & L2

Leachate levels in L1 and L2 have not exceeded the limits of 1m over the liner. As part of the capping works new pumps and level sensors were installed in both of the leachate sumps. The level sensors are connected into the SCADA system which automatically and continuously monitors the levels of leachate in L1 and L2.

5.5. Noise

Noise monitoring was carried out at the seven locations (N1 to N7) outlined in Table 5.4 and shown on Drawing 2001-114-01-003 Rev D. Noise measurements were taken for 30 minutes at each location. A summary of the monitoring results are presented in Table 5.5

Table 5.4. Noise Monitoring Locations

Location	Eastings	Northings
N1	285651	211809
N2	285930	211815
N3	286083	211704
N4	285938	211554
N5	285838	211494
N6	285540	211617
N7	285633	211489

5.5.1. Interpretation of Results

Four of the seven noise stations monitored were in exceedance of the EPA limit of 55 dB (A) for daytime noise. With the exception of N1, the dominant sources of noise at these locations were not caused by activities at the Silliot Hill facility. Traffic on the R448, and to and from the KTK landfill is the main contributors to noise levels in the area. The dominant noise source at N4, N5 and N7 were vehicles on the Carnalway Road and those accessing KTK landfill.

All the L_{AF90} readings are under the EPA limit for dB. This indicates that the intermittent noise for less than 10% of the monitoring period caused the greatest impact. Traffic sounds would normally fall into the L_{AF10} range.

It should be noted that the level of activity at the Silliot Hill site has fallen dramatically since the previous readings. This can be attributed in the downturn in the economy and the numbers of vehicles both private and commercial have fallen off dramatically.

Since last year KTK Landfill has ceased their landfilling operations and the amount of traffic entering and leaving the site has fallen substantially. It should be noted however that capping works is ongoing on site and this was a source of noise recorded at some of the locations.

5.5.2. Assessment of Tonal Components

All noise measurements were subject to a one-third octave band analysis to identify tonal components within the noise measured and the results of this analysis are presented in Appendix 2. Tonal noise was recorded only at monitoring N7 at 100Hz. The cause of this noise was not identified during the monitoring event, and it is a low noise. It could be audible, but is not in the range where the human ear is most sensitive.

At monitoring point N4 the noise was 250Hz. The cause of this noise was not identified.

Table 5.5. Noise Results

Location	Date	Time	2007 $L(A)_{EQ}$	2008 $L(A)_{EQ}$	2009 $L(A)_{EQ}$	2009 $L(A)_{F10}$	2009 $L(A)_{F90}$	Noise Source
N1	21/09/09	08:35	62	65	62	66	51	Traffic on R448 is the dominant noise source at this location. On site noise from traffic in the civic amenity area and distant traffic on the cap could be heard in the background.
N2	21/09/09	11:55	57	58	51	53	47	Dominant noise is the construction vehicles, Tractor at the capping works. There is a persistent hum from the electricity pylons, traffic and birdsong, aircrafts in the background
N3	21/09/09	12:30	49	47	48	49	45	Dominant noise is the electricity pylon. Background noise is from traffic on the Carnalway Road and capping works (including reversing sirens) and birdsong.
N4	21/09/09	13:45	63	59	63	59	52	Dominant noise is traffic on the R448 and traffic accessing KTK landfill. Background is coming from the gas extractor at KTK, some birdsong and heavy plant operating at the capping works at Silliot Hill.
N5	21/09/09	09:45	67	66	57	61	48	Dominant noise was traffic on the Carnalway Road to KTK Landfill and Silliot Hill capping works (27 no.) with traffic on the R448 providing persistent background noise. Noise of plant working at SIlliot Hill capping was audible.
N6	21/09/09	09:10	62	57	64	67	61	Traffic on R448, with some background birdsong. Noise from the capping works were audible: JCB bucket banging, Truck idling, Chainsaw, barking dog
N7	21/09/09	10:50	60	62	55	56	42	Traffic on the Carnalway Road to KTK Landfill and on R448 provides the dominant noise sources. Some noise from construction vehicles on the cap. Background noise came from birds and the blower in Methane plant, lawnmower.

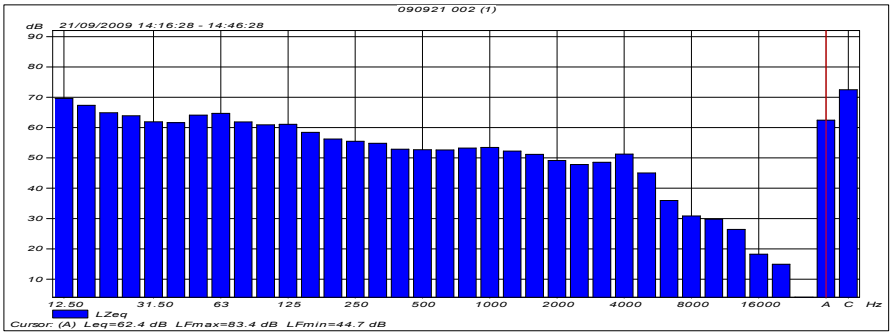


Figure 5.12. Noise Location N1 1/3 Octave Band Analysis

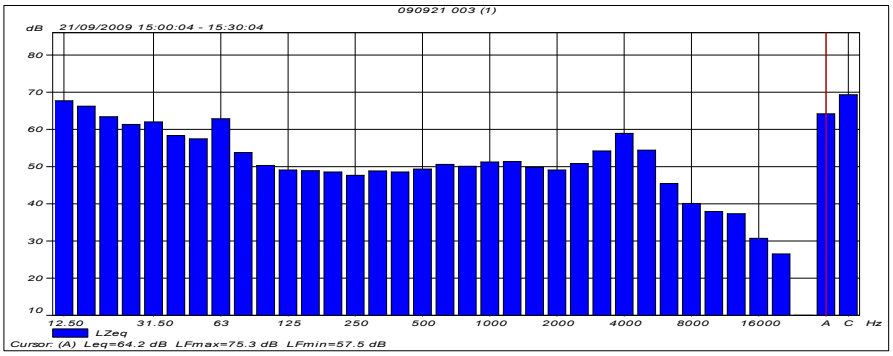


Figure 5.13. Noise Location N6 1/3 Octave Band Analysis

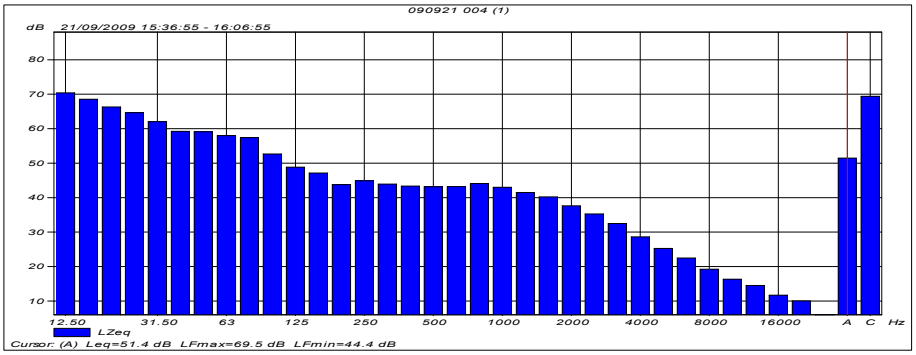


Figure 5.14. Noise Location N2 1/3 Octave Band Analysis

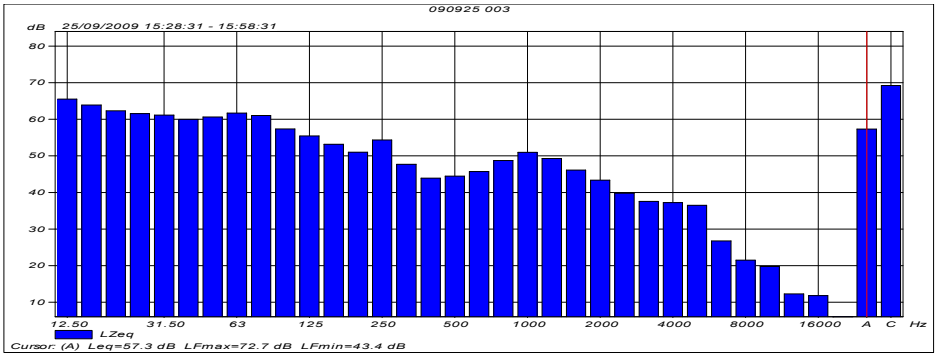


Figure 5.15. Noise Location N5 1/3 Octave Band Analysis

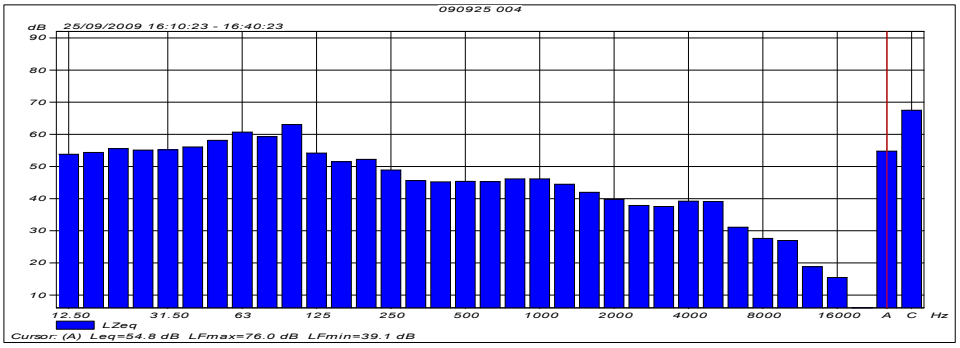


Figure 5.16. Noise Location N7 1/3 Octave Band Analysis

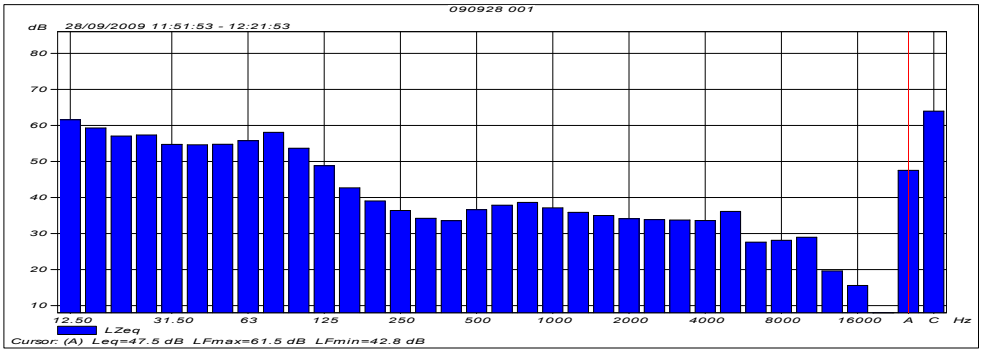


Figure 5.17. Noise Location N3 1/3 Octave Band Analysis

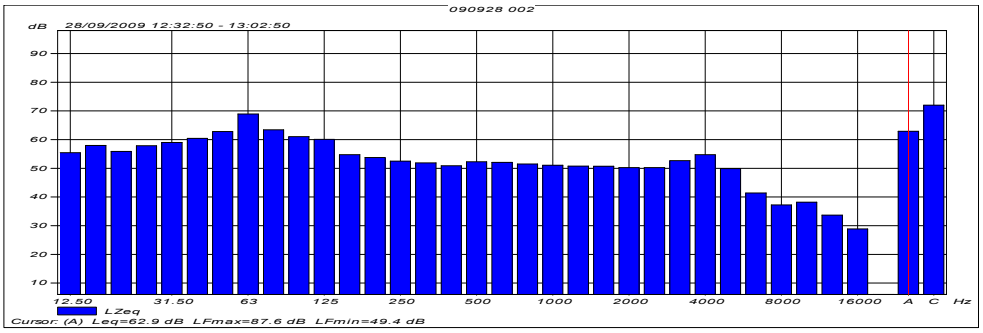


Figure 5.18. Noise Location N4 1/3 Octave Band Analysis

5.6. Dust Deposition and PM_{10} Monitoring

Dust monitoring was carried out in accordance with the licence with the licence at six locations (D1 to D4 & D6 to D7) as outlined in Table 5.6 and shown on Drawing 2001-114-01-003 Rev D. The results of the monitoring are presented in Appendix II.

Table 5.6 Dust Monitoring Locations

Station	Easting	Northing	Location
D1/PM_{10}1	285707	211809	Entrance to facility
D2	285931	211815	Northern perimeter of facility
D3	286083	211704	NE perimeter of Phase 1
D4	285938	211554	Eastern perimeter of Phase 1
D5	285838	211494	SE perimeter of Phase 1
D6/PM_{10}2	285540	211617	Western perimeter of Phase 2
D7/PM_{10}3	285633	211489	Southern perimeter of landfill

5.6.1 Interpretation of Results

Dust standards (350 mg/m^2/day) were not exceeded at any stage during the 2009 monitoring periods.

All PM10 results were within the 50 µg/m^3 limit as recommended in the Air Quality Standards Regulations (SI No. 271 of 2002).

5.7. Compost

No waste material was taken into the site for composting during the monitoring period. Consequently, compost quality has not been analysed during this year and the composting facility remains closed for the foreseeable future.

5.8. Climate

The annual rainfall figures recorded at KTK Greenstar are presented in Table 5.7 and illustrated in Figure 5.18. Where KTK data was unavailable records for Casement Aerodrome were used.

Table 5.7. Monthly Rainfall, Evapotranspiration and Temperature Data 2009

Month	Rainfall (KTK) (mm)	Evapotranspiration (Casement) (mm)	Evaporation (Casement) (mm)	Average Monthly Temperature (KTK) (^{o}C)
January	96.00	11.90	16.87	4.9
February	18.00	16.54	23.43	2.0
March	24.4[1]	35.51	54.67	6.7[1]
April	74.1[1]	49.28	73.04	8.8[1]
May	53.2[1]	74.91	115.42	11.2[1]
June	72.8[1]	90.02	126.19	14.2[1]
July	76.80	78.46	113.18	13.8
August	71.40	68.30	99.97	14.5
September	42.60	45.20	64.51	12.2
October	87.20	25.58	35.08	11.1
November	174.40	14.72	20.46	7.0
December	54.20	8.34	11.28	3.1
Total	845.1	518.75	754.10	9.1

Note: [1] Reading taken from Casement Aerodrome

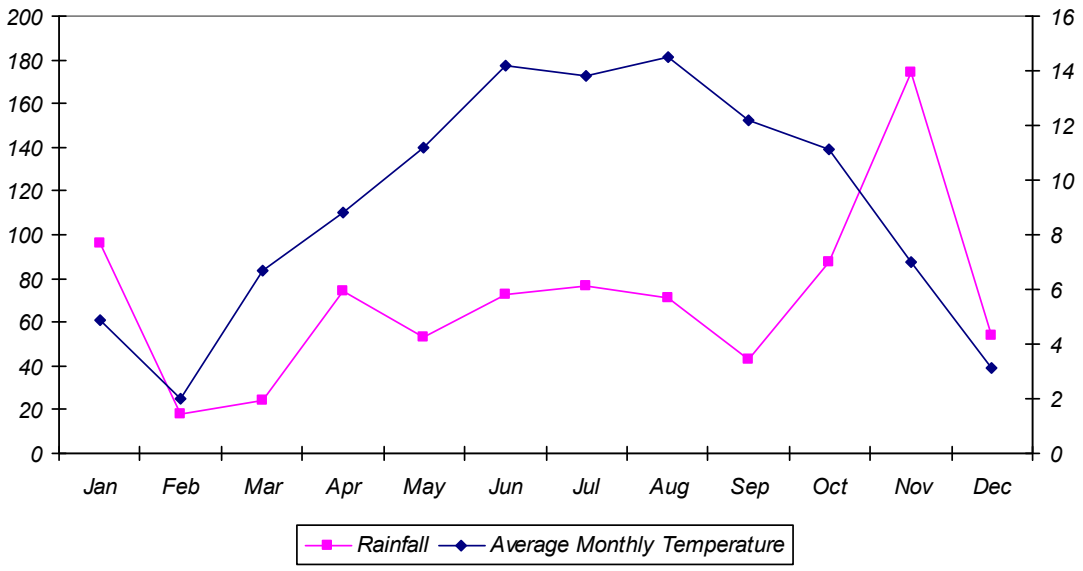


Figure 5.18. 2009 Rainfall and Temperature

6. Emissions

6.1. Landfill Gas Quantities

A landfill gas management plan was submitted to the Agency on the 12th November 2002. The plan contained a review on the controls on landfill gas, migration from the site and a gas prediction model.

Irish Power Systems installed a gas collection system in 2003. This consisted of a gas utilisation plant and an enclosed gas flare. The enclosed gas flare was put into operation in October 2003 and the gas utilisation plant was commissioned and opened in March 2004.

As part of the capping works, Kildare County Council installed a new gas collection system. This included the installation of 47 1 metre diameter wells for increased gas capture. The new collection system is connected into the enclosed flare. The capping works were completed in mid 2009 and flaring recommenced at the start of June 2009. Gas quantities at the site are now insufficient to power the gas utilisation plant.

The gas collected by the enclosed flare unit was approximately 2,428,800 m^3 (based on an average of 550 m^3 per hour) for the six months of flaring in 2009. This is made up of 25% methane, 18% carbon dioxide and the remainder is made up of other compounds. This translates to 607,200 m^3 of methane and 437,184 m^3 of carbon dioxide extracted and flared onsite. Given the new wells, the good condition of the collection system and that the site is fully capped, the efficiency of the gas collection system is estimated at 90%. Therefore, it is estimated that the total landfill gas generated at Silliot Hill Landfill in 2009 was 5,397,333 m^3.

Odour Monitoring Ireland was engaged to carry out the monitoring of emissions from the flare stack. All parameters were within the emission limit values specified in Schedule C.4 of the waste licence. It was also noted that the landfill gas flare is achieving a methane destruction efficiency of greater than 99%. The full report is included in Appendix III.

6.2. Leachate Quantities

The leachate produced onsite is discharged, via a leachate rising main, to the Kilcullen sewerage scheme. The Kilcullen sewerage scheme is linked, via a leachate rising main, to Osberstown WWTP. The leachate is pumped through a methane stripping plant prior to discharge. The leachate system is now fully automated as of March 2009.

The volumes removed from the site monthly are presented in Table 6.2.

Table 6.1. Quantities of Leachate Removed from Site 2009

Month	Quantity m^3	Month	Quantity m^3
January	621	**July**	1127
February	903	**August**	889
March	20	**September**	1524
April	136	**October**	1116
May	690	**November**	1284
June	249	**December**	1240
		Total	**9799**

6.3. Indirect Emissions to Groundwater

Volumes of rainfall entering Phase 1 have been minimised in the past five years following the installation of a capping system, comprising at least 1m of boulder clay and 300mm of topsoil, and the directing of the surface water away from the waste body. Since then there has been a significant decrease in the volume of leachate being generated, from an estimated 66,260m^3 per annum in 1997 (based on long-term monthly mean rainfall values) to 3,805 m^3 per annum in 2009. Groundwater quality beneath and down-gradient of the site is being closely monitored to assess trends.

The following section sets out a water balance calculation for the site as a whole. However, it is important to state at the outset the assumptions being used in these calculations:

- Waste placed in Phase 1 of Silliot Hill landfill was deposited in a disused quarry. This area did not receive an artificial lining system; with the result that leachate can enter the local groundwater. Leachate generated from all areas of the facility is collected in the leachate collection system and discharged to Osberstown WWTP for treatment. It has therefore been assumed for the purposes of these calculations that indirect emissions to groundwater are generated only from Phase 1 of the landfill.

The calculated volume of leachate generated from Phase 1 in 2009 has been estimated at 3,805m3. 9,799m3 was collected from the lined portion of the site and discharged to Osberstown WWTP fro treatment. In unlined area the leachate diluted and disperses in the subsurface environment.

6.4. Monthly Water Balance Calculations

The monthly water balance calculations have been calculated as outlined in Appendix III. The results are summarised in Table 6.3. The predicted amount of leachate can be compares with the actual amount removed from site each month.

Water balance calculations were carried out for the different elements of the facility, as follows:

- Phase 1 – unlined portion of landfill
- Phase 2 – lined portion of landfill
- Waste Transfer Station
- Civic Amenity Facility
- Other; septic tank etc.

6.4.1. Phase 1 – Unlined Portion of Landfill

Phase 1 of the landfill relies on the dilute and disperse method for dealing with leachate. The area received a final cap in 1997. Recent augmentation works to improve the clay cap were completed mid-2008. The water balance calculations carried out for Phase 1 assumed that 10% of incident rainfall percolated through this final cap into the waste body. Potential evapotranspiration is also taken into account.

6.4.2. Phase 2 – Lined Portion of Landfill

Phase 2 of the landfill accepted waste from October 1997 to March 2002. The cells received a 300mm intermediate cap of clay following their closure. They received a final cap during 2007 and 2008. The water balance calculation for this area assumed that 10% of the incident rainfall percolated through the synthetic cap into the waste body. All of this leachate was collected in the lined cells and pumped to the lagoon, prior to discharge to the Kilcullen sewerage system. Potential evaporation was taken into account.

6.4.3. Waste Transfer Station

Runoff from the floor area of the waste transfer station is collected into the leachate collection system. The leachate is collected in a pump sump and is pumped to the lagoon. Rainwater is collected from the roof of the transfer station and directed into rainwater collection tanks.

6.4.4. Civic Amenity Centre

All rainfall incidents on the civic amenity area are directed to a soak pit located at the northern corner of the facility and therefore does not affect leachate levels.

6.4.5. Sludge Treatment Facility

Leachate is not generated by the activities associated with the composting facility, which was inactive for the 2009 monitoring period.

6.4.6. Leachate Volumes

Table 6.3 outlines the predicted and actual volumes of leachate generated at the facility

Table 6.2. Leachate Volumes for 2009

Location	Leachate Generated (m^3)
Phase 1 Landfill Area	3,805
Phase 2 Landfill Area	2,028
Waste Transfer Station	1,180
Total Predicted Volume of Leachate (Excluding Phase 1)	**7,510 (3,805)**
Predicted Total Volume of Leachate Removed	**3,705**

The volume of leachate removed in 2009, 9,799m^3, is compared to 3,705m^3 (predicted volume of leachate less that predicted for Phase 1). This is a difference of 6,094m3. This may be due to the build up of leachate during capping works when no leachate was removed from Phase 2.

6.5. Site Development Works during 2009

- Completion of the capping works on Phase 2 including the top-soiling and seeding of the newly capped area.
- Top-soiling and seeding of Phase 1A.
- Final commissioning of the leachate treatment facility.
- Installation of a new landfill gas management model.

6.6. Proposed Development Works for 2010

- Purchase and installation of a new enclosed flare capable of operating at low gas quality and quantity.

6.6.1. Landfill Site Restoration

The restoration plan for the entire site is as follows:

- Phase 1B
  No further restoration of this area is planned,

- Phase 1A
  No further restoration of this area is planned,

- Phase 2
  No further restoration of this area is planned

7. Environmental Targets

In compliance with Condition 2.3. of the waste licence an Environmental Management Programme (EMP) has been established for the facility. The EMP includes the timescale for achieving the Objectives and Targets and the designation of responsibility for achieving the Objectives and Targets.

1. Increase the throughput of domestic customers where possible at the Civic Amenity site.

2. Increase awareness in recycling by more advertising and pamphlets.

3. Continue the School Tour Programme and increase numbers, where possible.

4. Continue efforts to source new markets for recyclable products.

5. Build a garden made from recyclable materials for display purposes.

6. Increase recycling rates, where possible.

7. To endeavour to reduce energy consumption.

8. Procurement and installation of a new enclosed, low calorific LFG flare to facilitate more efficient management of decreasing gas quantity and quality.

9. Minimisation of gas migration, especially along the southern boundary of the site.

10. Training in the use of the new Gas Model of the site, received November 2009.

Table 7.1. Objectives and Targets 2010-06-11

Objective/Target	Progress during 2009
Increase the throughput of domestic customers where possible	On-going
Increase awareness in recycling by more advertising and pamphlets	On-going
Continue the School Tour Programme and increase numbers, where possible	On-going
Continue efforts to source new markets for recyclable products	On-going
Build a garden made from recyclable materials for display purposes	Postponed due to lack of funding
Increase recycling rates, where possible	On-going
To endeavour to reduce energy consumption.	On-going
Procurement and installation of a new enclosed, low calorific LFG flare	Pumping trial to be carried out
Minimisation of gas migration	This will be achieved in tandem with Targets 8 & 10
Training in the use of the new Gas Model	Scheduled for summer 2010

7.2. Site Procedures & Forms

There has been no change to the forms used on-site, as provided in the 2004 AER.

8. Miscellaneous

8.1. Energy Consumption

The figures for energy use in 2009 are as follows:

- Electricity: 175,000 kWh (approximate)
- Fuel: 12,000 litres (approximate)
- Water: 1,000 m^3 (approximate)

8.2. Incidents and Complaints Summary

The facility manager records all site incidents and complaints on a register, which is held at the site office. The facility manager reported 12 incidents of breaches of the landfill gas trigger levels to the Agency. No landfill gas has been detected in the onsite buildings in 2009. The facility manager also reported one incident of a power outage at the enclosed flare onsite resulting in flare downtime.

No complaints were received from persons regarding the facility in 2009.

8.3. Financial Provision

As part of the waste licence for the facility, Kildare County Council pays an annual contribution of €21,669 towards the cost of monitoring the facility.

8.3. Management & Staffing Structure

The management and staffing structure of the facility has been included in Appendix IV.

Appendix I

Drawing

Appendix II

Monitoring Results

Web

EURO environmental services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/01
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	18/12/2009
Customer Ref	SW1 09/12/09	**Sample Type**	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Surface Water)	114	Colorimetry	0.023	mg/L as N	UKAS
BOD (Surface Water)	113	Electrometry	<2	mg/L	UKAS
Chloride (Surface Water)	100	Colorimetry	55.91	mg/L	UKAS
COD (Surface Water)	107	Colorimetry	16	mg/L	UKAS
Conductivity (Surface Water)	112	Electrometry	882	uscm -1@25C	UKAS
pH (Surface Water)	110	Electrometry	8	pH Units	UKAS
Solids (Total Suspended)	106	Filtration/ Drying @ 104C	3	mg/L	

Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 18/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

EURO environmental services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

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		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	18/12/2009
Customer Ref	SW2 09/12/09	**Sample Type**	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Surface Water)	114	Colorimetry	7.12	mg/L as N	UKAS
BOD (Surface Water)	113	Electrometry	<2	mg/L	UKAS
Chloride (Surface Water)	100	Colorimetry	52.7	mg/L	UKAS
COD (Surface Water)	107	Colorimetry	26	mg/L	UKAS
Conductivity (Surface Water)	112	Electrometry	898	uscm -1@25C	UKAS
pH (Surface Water)	110	Electrometry	8.1	pH Units	UKAS
Solids (Total Suspended)	106	Filtration/ Drying @ 104C	5	mg/L	

Web Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 18/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

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Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
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Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/03
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	18/12/2009
Customer Ref	SW3 09/12/09	**Sample Type**	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Surface Water)	114	Colorimetry	0.048	mg/L as N	UKAS
BOD (Surface Water)	113	Electrometry	<2	mg/L	UKAS
Chloride (Surface Water)	100	Colorimetry	11.74	mg/L	UKAS
COD (Surface Water)	107	Colorimetry	14	mg/L	UKAS
Conductivity (Surface Water)	112	Electrometry	525	uscm -1@25C	UKAS
pH (Surface Water)	110	Electrometry	7.8	pH Units	UKAS
Solids (Total Suspended)	106	Filtration/ Drying @ 104C	<2	mg/L	

Web Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 18/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

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Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/04
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	18/12/2009
Customer Ref	SW4 09/12/09	**Sample Type**	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Surface Water)	114	Colorimetry	0.346	mg/L as N	UKAS
BOD (Surface Water)	113	Electrometry	<2	mg/L	UKAS
Chloride (Surface Water)	100	Colorimetry	12.04	mg/L	UKAS
COD (Surface Water)	107	Colorimetry	41	mg/L	UKAS
Conductivity (Surface Water)	112	Electrometry	375	uscm -1@25C	UKAS
pH (Surface Water)	110	Electrometry	7.4	pH Units	UKAS
Solids (Total Suspended)	106	Filtration/ Drying @ 104C	23	mg/L	

Web Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 18/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

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Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/05
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	18/12/2009
Customer Ref	SW6 09/12/09	**Sample Type**	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Surface Water)	114	Colorimetry	0.015	mg/L as N	UKAS
BOD (Surface Water)	113	Electrometry	<2	mg/L	UKAS
Chloride (Surface Water)	100	Colorimetry	7.87	mg/L	UKAS
COD (Surface Water)	107	Colorimetry	19	mg/L	UKAS
Conductivity (Surface Water)	112	Electrometry	125	uscm -1@25C	UKAS
pH (Surface Water)	110	Electrometry	7.8	pH Units	UKAS
Solids (Total Suspended)	106	Filtration/ Drying @ 104C	10	mg/L	

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Date : 18/12/2009

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Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
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Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/06
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	18/12/2009
Customer Ref	SW7 09/12/09	**Sample Type**	Surface Water

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Surface Water)	114	Colorimetry	0.105	mg/L as N	UKAS
BOD (Surface Water)	113	Electrometry	<2	mg/L	UKAS
Chloride (Surface Water)	100	Colorimetry	9.83	mg/L	UKAS
COD (Surface Water)	107	Colorimetry	21	mg/L	UKAS
Conductivity (Surface Water)	112	Electrometry	156	uscm -1@25C	UKAS
pH (Surface Water)	110	Electrometry	7.8	pH Units	UKAS
Solids (Total Suspended)	106	Filtration/ Drying @ 104C	8	mg/L	

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Date : 18/12/2009

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Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/07
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	PW2 -09 09/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.011	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	38.08	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	13	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	829	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	<0.66	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	9.42	mg/L as N	
pH (Ground Water)	110	Electrometry	7.2	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	1.72	mg/L	UKAS
Sodium	184	ICPMS	24.89	mg/L	
Total Organic Carbon	316	TOC analyser (NPOC)	3.74	mg/L	UKAS

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Donna Heslin - Laboratory Manager

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Boyne Business Park,
Drogheda,
Co. Louth
Ireland

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Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/08
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	PW4 09/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.026	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	15	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	2	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	625	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	<0.66	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	5.73	mg/L as N	
pH (Ground Water)	110	Electrometry	7.5	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	0.69	mg/L	UKAS
Sodium	184	ICPMS	121.90	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	3.01	mg/L	UKAS

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Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/001/09
		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	PW9 09/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.057	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	13.5	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	2	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	723	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	<0.66	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	1.34	mg/L as N	
pH (Ground Water)	110	Electrometry	7.2	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	<0.35	mg/L	UKAS
Sodium	184	ICPMS	8.01	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	2.22	mg/L	UKAS

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Boyne Business Park,
Drogheda,
Co. Louth
Ireland

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Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

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		Date of Receipt	09/12/2009
		Date Testing Commenced	09/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	PW11 09/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.297	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	7.55	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	26	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	191	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	433	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	5.9	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	2.75	mg/L as N	
pH (Ground Water)	110	Electrometry	7.7	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	4.82	mg/L	UKAS
Sodium	184	ICPMS	6.78	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	3.23	mg/L	UKAS

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Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/002/01
		Date of Receipt	10/12/2009
		Date Testing Commenced	10/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	BH4 -07 10/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	238.26	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	163.91	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	35	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	4130	uscm -1@25C	
Iron (Ground Water)	177	ICPMS	4351	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	<0.28	mg/L as N	
pH (Ground Water)	110	Electrometry	7	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	84.55	mg/L	
Sodium	184	ICPMS	421.00	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	55.40	mg/L	UKAS

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Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/002/02
		Date of Receipt	10/12/2009
		Date Testing Commenced	10/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	BH9D 10/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.84	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	100.75	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	1	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	103	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	1330	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	496.4	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	17.76	mg/L as N	
pH (Ground Water)	110	Electrometry	7.1	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	7.30	mg/L	UKAS
Sodium	184	ICPMS	67.64	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	3.95	mg/L	UKAS

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Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/002/03
		Date of Receipt	10/12/2009
		Date Testing Commenced	10/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	BH13 -07 10/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.159	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	16.61	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	12	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	707	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	45.8	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	9.05	mg/L as N	
pH (Ground Water)	110	Electrometry	7.3	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	1.25	mg/L	UKAS
Sodium	184	ICPMS	7.28	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	3.53	mg/L	UKAS

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Donna Heslin - Laboratory Manager

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Drogheda,
Co. Louth
Ireland

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Fax: +353 41 9846171
Web: www.euroenv.ie
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Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/002/04
		Date of Receipt	10/12/2009
		Date Testing Commenced	10/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	GWR1 10/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	0.044	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	16.63	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	17	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	703	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	284.6	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	2.93	mg/L as N	
pH (Ground Water)	110	Electrometry	7.1	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	1.15	mg/L	UKAS
Sodium	184	ICPMS	6.90	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	2.95	mg/L	UKAS

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Donna Heslin - Laboratory Manager

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Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/002/05
		Date of Receipt	10/12/2009
		Date Testing Commenced	10/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	GWR2 10/12/09	**Sample Type**	Groundwater

Test Parameter	SOP	Analytical Technique	Result	Units	
Ammonia (Ground Water)	114	Colorimetry	<0.01	mg/L as N	
Chloride (Ground Water)	100	Colorimetry	11.01	mg/L	
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	83	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	316	no/ 100ml	Acc.
Conductivity (Ground Water)	112	Electrometry	348	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	1517	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	<0.28	mg/L as N	
pH (Ground Water)	110	Electrometry	7.4	pH Units	
Phenols (Total)	223	GCMS	<0.10	ug/L	UKAS
Potassium	184	ICPMS	3.32	mg/L	
Sodium	184	ICPMS	2.46	mg/L	UKAS
Total Organic Carbon	316	TOC analyser (NPOC)	6.68	mg/L	UKAS

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Donna Heslin - Laboratory Manager

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Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/003/01
		Date of Receipt	15/12/2009
		Date Testing Commenced	15/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	29/12/2009
Customer Ref	BH3 15/12/09	**Sample Type**	Groundwater

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Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Ground Water)	114	Colorimetry	2.20	mg/L as N	UKAS
Chloride (Ground Water)	100	Colorimetry	21.09	mg/L	UKAS
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	46	no/ 100ml	
Conductivity (Ground Water)	112	Electrometry	697	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	11850	ug/L	
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	<0.28	mg/L as N	UKAS
pH (Ground Water)	110	Electrometry	7	pH Units	UKAS
Potassium	184	ICPMS	1.92	mg/L	
Sodium	184	ICPMS	7.26	mg/L	
Total Organic Carbon	316	TOC analyser (NPOC)	2.73	mg/L	

Web Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 29/12/2009

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Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/003/02
		Date of Receipt	15/12/2009
		Date Testing Commenced	15/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	29/12/2009
Customer Ref	BH 11D 15/12/09	**Sample Type**	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Ground Water)	114	Colorimetry	0.176	mg/L as N	UKAS
Chloride (Ground Water)	100	Colorimetry	14.52	mg/L	UKAS
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	0	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	58	no/ 100ml	
Conductivity (Ground Water)	112	Electrometry	675	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	2643	ug/L	
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	7.11	mg/L as N	UKAS
pH (Ground Water)	110	Electrometry	7.3	pH Units	UKAS
Potassium	184	ICPMS	0.77	mg/L	
Sodium	184	ICPMS	5.62	mg/L	
Total Organic Carbon	316	TOC analyser (NPOC)	1.17	mg/L	

Web Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 29/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

EURO environmental services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/003/03
		Date of Receipt	15/12/2009
		Date Testing Commenced	15/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	29/12/2009
Customer Ref	KTK 20 15/12/09	**Sample Type**	Groundwater

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia (Ground Water)	114	Colorimetry	0.947	mg/L as N	UKAS
Chloride (Ground Water)	100	Colorimetry	14.77	mg/L	UKAS
Coliforms (Faecal)	140	Filtration/ Incubation 44C/ 24	20	no/ 100ml	
Coliforms (Total)	140	Filtration/ Incubation 37C/ 24	31	no/ 100ml	
Conductivity (Ground Water)	112	Electrometry	731	uscm -1@25C	UKAS
Iron (Ground Water)	177	ICPMS	430.1	ug/L	UKAS
Nitrogen (Total Oxidised) (Ground	151	Colorimetry	<0.28	mg/L as N	UKAS
pH (Ground Water)	110	Electrometry	7.2	pH Units	UKAS
Potassium	184	ICPMS	1.20	mg/L	
Sodium	184	ICPMS	14.37	mg/L	
Total Organic Carbon	316	TOC analyser (NPOC)	3.05	mg/L	

Web Certificate
Katherine McQuillan - Deputy Technical Manager

Date : 29/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

EURO environmental services

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Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/003/04
		Date of Receipt	15/12/2009
		Date Testing Commenced	15/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	L1 15/12/09	**Sample Type**	Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia	114	Colorimetry	<0.01	mg/L as N	
BOD	113	Electrometry	30	mg/L	
Chloride	100	Colorimetry	227.38	mg/L	
COD	107	Colorimetry	537	mg/L	
Conductivity	112	Electrometry	9170.0	uscm -1@25C	
Nitrogen (Total Oxidised)	151	Colorimetry	0.10	mg/L as N	
pH	110	Electrometry	7.2	pH Units	

Web Certificate
Donna Heslin - Laboratory Manager

Date : 24/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

EURO environmental services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/003/05
		Date of Receipt	15/12/2009
		Date Testing Commenced	15/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	L3 15/12/09	**Sample Type**	Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia	114	Colorimetry	36.04	mg/L as N	
BOD	113	Electrometry	<2	mg/L	
Chloride	100	Colorimetry	36.44	mg/L	
COD	107	Colorimetry	30	mg/L	
Conductivity	112	Electrometry	1333.0	uscm -1@25C	
Nitrogen (Total Oxidised)	151	Colorimetry	0.37	mg/L as N	
pH	110	Electrometry	7.1	pH Units	

Web Certificate
Donna Heslin - Laboratory Manager

Date : 24/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

EURO environmental services

Environmental Science & Management
Water,Soil & Air Testing

Unit 35,
Boyne Business Park,
Drogheda,
Co. Louth
Ireland

Tel: +353 41 9845440
Fax: +353 41 9846171
Web: www.euroenv.ie
email: info@euroenv.ie

Customer	Claire McLaughlin Kildare County Council - Silliot Landfill Silliot Hill IWMF Kilcullen Co. Kildare	**Lab Report Ref. No.**	1391/003/06
		Date of Receipt	15/12/2009
		Date Testing Commenced	15/12/2009
		Received or Collected	Collected by Euro
		Condition on Receipt	Acceptable
Customer PO	400251094	**Date of Report**	24/12/2009
Customer Ref	L4 15/12/09	**Sample Type**	Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
Ammonia	114	Colorimetry	58.63	mg/L as N	
BOD	113	Electrometry	<2	mg/L	
Chloride	100	Colorimetry	48.65	mg/L	
COD	107	Colorimetry	46	mg/L	
Conductivity	112	Electrometry	1701.0	uscm -1@25C	
Nitrogen (Total Oxidised)	151	Colorimetry	0.43	mg/L as N	
pH	110	Electrometry	7.0	pH Units	

Web Certificate
Donna Heslin - Laboratory Manager

Date : 24/12/2009

Acc. : Accredited Parameters by ISO 17025:2005

ALcontrol Laboratories (Dublin)

18a Rosemount Business Park,
Ballycoolin,
Dublin 11
Ireland
Tel: +353 (0) 1 8829893
Fax: +353 (0) 1 8829895

CERTIFICATE OF ANALYSIS

Client: *Kildare County Council*

Water Services
Aras Cilldara
Devoy Park
Naas
Co.Kildare
Ireland

Attention: *CMcLaughlin*

Authorised On: *5 March, 2009*

Our Reference: *09-B00785/01*

Your Reference: *Kilcullen (Silliot Hill)*

Location:

A total of 10 samples was received for analysis on Tuesday, 24 February 2009. Accredited laboratory tests are defined in the log sheet, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Signed

Dylan Halpin
Team Leader Project Co-ordination

Lorraine McNamara
General Manager

Compiled By

Mark Butler

UKAS TESTING
1291
GROUP

ALcontrol Laboratories Ireland

Test Schedule

Ref Number: 09-B00785/01 **Sample Type: WATER**

Client: Kildare County Council Location:

Date of Receipt: 24/02/2009 Client Contact: CMcLaughlin

Client Ref: Kilcullen (Silliot Hill)

Detection Method				5 DAY ATU	Calculation	Filtration	Filtration	GRAVIMETRIC	HPLC	ICP MS	ICP OES	ICP OES	KONE	METER	METER	SPECTRO	
UKAS Accredited [Testing Laboratory] No. 1291				☐	☐			☐	☐	☐			☐	☐	☐	☐	
ALcontrol Reference	Sample Identity	Other ID	P / V	BOD Unfiltered	Total Oxidised Nitrogen as N	Faecal Coliforms*	Total Coliforms*	Total Suspended Solids	Total Phenols	Dissolved Iron Low Level	Dissolved Potassium	Dissolved Sodium	Chloride	Electrical Conductivity @ 25C	pH	COD Unfiltered	
09-B00785-S0013-A01	SW1	24/02/09	Plastic Bottle	X	-	-	-	X	-	-	-	-	X	X	X	X	
09-B00785-S0014-A01	SW2	24/02/09	Plastic Bottle	X	-	-	-	X	-	-	-	-	X	X	X	X	
09-B00785-S0015-A01	SW3	24/02/09	Plastic Bottle	X	-	-	-	X	-	-	-	-	X	X	X	X	
09-B00785-S0016-A01	SW4	23/02/09	Plastic Bottle	X	-	-	-	X	-	-	-	-	X	X	X	X	
09-B00785-S0017-A01	SW6	23/02/09	Plastic Bottle	X	-	-	-	X	-	-	-	-	X	X	X	X	
09-B00785-S0018-A01	SW7	23/02/09	Plastic Bottle	X	-	-	-	X	-	-	-	-	X	X	X	X	
09-B00785-S0019-A01	PW4	23/02/09	Plastic Bottle	-	X	X	X	-	X	X	X	X	X	X	X	-	
09-B00785-S0019-A11	PW4	23/02/09	Plastic Bottle + NaOH	On Hold													
09-B00785-S0020-A01	PW9	23/02/09	Plastic Bottle	-	X	X	X	-	X	X	X	X	X	X	X	-	
09-B00785-S0020-A11	PW9	23/02/09	Plastic Bottle + NaOH	On Hold													
09-B00785-S0021-A01	PW11	23/02/09	Plastic Bottle	-	X	X	X	-	X	X	X	X	X	X	X	-	
09-B00785-S0021-A11	PW11	23/02/09	Plastic Bottle + NaOH	On Hold													
09-B00785-S0022-A01	BH11D	23/02/09	Plastic Bottle	-	X	X	X	-	X	X	X	X	X	X	X	-	
09-B00785-S0022-A11	BH11D	23/02/09	Plastic Bottle + NaOH	On Hold													

Notes : NUMERIC VALUES INDICATE ADDITIONAL SCHEDULING

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

ALcontrol Laboratories Ireland

Test Schedule Summary

Ref Number: 09-B00785/01 **Sample Type:** WATER
Client: Kildare County Council Location:
Date of Receipt: 24/02/2009 Client Contact: CMcLaughlin
Client Ref: Kilcullen (Silliot Hill)

** SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY*

SCHEDULE	METHOD	TEST NAME	TOTAL
X	5 DAY ATU	BOD Unfiltered	6
X	Calculation	Total Oxidised Nitrogen	4
X	Filtration	Faecal Coliforms*	4
X	Filtration	Total Coliforms*	4
X	GRAVIMETRIC	Total Suspended Solids	6
X	HPLC	Total Phenols by HPLC	4
X	ICP MS	Dissolved Iron Low Level	4
X	ICP OES	Dissolved Potassium	4
X	ICP OES	Dissolved Sodium	4
X	KONE	Chloride	10
X	METER	Electrical Conductivity @ 25C	10
X	METER	pH (Liquid)	10
X	SPECTRO	COD Unfiltered	6

☐ Interim
☐ Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 09-B00785/01 **Sample Type: WATER**

Client: Kildare County Council Location:

Date of Receipt: 24/02/2009 Client Contact: CMcLaughlin

(of first sample) Client Ref: Kilcullen (Silliot Hill)

	Detection Method	5 DAY ATU	Calculation	Filtration	Filtration	GRAVIMETRIC	HPLC	ICP MS	ICP OES	ICP OES	KONE	METER	METER	SPECTRO		
	Method Detection Limit	<2mg/l	<0.3mg/l	<1cfu/100ml	<1cfu/100ml	<10mg/l	<0.01mg/l	<2ug/l	<0.2mg/l	<0.2mg/l	<1mg/l	<0.014mS/cm	napH Units	<15mg/l		
UKAS Accredited [Testing Laboratory] No. 1291		☐	☐			☐	☐	☐			☐	☐	☐	☐		
ALcontrol Reference	Sample Identity	Other ID	BOD Unfiltered	Total Oxidised Nitrogen as N	Faecal Coliforms*	Total Coliforms*	Total Suspended Solids	Total Phenols	Dissolved Iron Low Level	Dissolved Potassium	Dissolved Sodium	Chloride	Electrical Conductivity @ 25C	pH	COD Unfiltered	
			mg/l	mg/l	cfu/100ml	cfu/100ml	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mS/cm	pH Units	mg/l	
09-B00785-S0013	SW1	24/02/09	<2	-	-	-	<10	-	-	-	-	107	1.100	8.01	<15	
09-B00785-S0014	SW2	24/02/09	<2	-	-	-	28	-	-	-	-	88	1.049	7.91	22	
09-B00785-S0015	SW3	24/02/09	<2	-	-	-	25	-	-	-	-	17	0.692	7.62	<15	
09-B00785-S0016	SW4	23/02/09	<2	-	-	-	168	-	-	-	-	17	0.372	7.05	139	
09-B00785-S0017	SW6	23/02/09	<2	-	-	-	<10	-	-	-	-	12	0.256	7.83	<15	
09-B00785-S0018	SW7	23/02/09	<2	-	-	-	<10	-	-	-	-	11	0.288	7.85	<15	
09-B00785-S0019	PW4	23/02/09	-	6.2	<1	800	-	<0.01	<2	1.3	8.9	15	0.653	7.46	-	
09-B00785-S0020	PW9	23/02/09	-	1.5	<1	<1	-	<0.01	<2	0.6	7.9	14	0.736	7.33	-	
09-B00785-S0021	PW11	23/02/09	-	1.1	100	700	-	<0.01	5	4.4	8.0	9	0.395	7.74	-	
09-B00785-S0022	BH11D	23/02/09	-	6.4	<1	17	-	<0.01	16	0.8	8.0	15	0.650	7.44	-	

Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL. **NDP** = NO DETERMINATION POSSIBLE

Checked By : Mark Butler

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

APPENDIX

APPENDIX

1. *Results are expressed as mg/kg dry weight (dried at 30°C) on all soil analyses except for the following: NRA Leach tests, flash point, and ammoniacal N_2 by the BRE method, VOC, PRO, Cyanide, Acid Soluble Sulphide,TPH by IR, OFGs and SEM.*

2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*

3. *A sub sample of all samples received will be retained free of charge for one month for soils and one month for waters (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.*

4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*

5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*

6. *When requested, an asbestos screen is done in-house on soils and if no fibres are found will be reported as NFD – no fibres detected. If fibres are detected, then identification and quantification is carried out by ALcontrol Technichem or Alcontrol Shutlers in the UK . If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos results are known. If asbestos is present, then no analysis requiring dry sample are undertaken.*

7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.*

8. *NDP – No Determination Possible due to insufficient/unsuitable sample.*

9. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*

10. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*

Last updated February 2005

ALcontrol Laboratories (Dublin)

18a Rosemount Business Park,
Ballycoolin,
Dublin 11
Ireland
Tel: +353 (0) 1 8829893
Fax: +353 (0) 1 8829895

CERTIFICATE OF ANALYSIS

Client: *Kildare County Council*

Water Services
Aras Cilldara
Devoy Park
Naas
Co.Kildare
Ireland

Attention: *CMcLaughlin*

Authorised On: *6 March, 2009*

Our Reference: *09-B00801/01*

Your Reference: *Kilcullen (Silliot Hill)*

Location:

A total of 9 samples was received for analysis on Wednesday, 25 February 2009. Accredited laboratory tests are defined in the log sheet, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our final report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Signed

Dylan Halpin
Team Leader Project Co-ordination

Lorraine McNamara
General Manager

Compiled By

Mark Butler

UKAS TESTING
1291
GROUP

Printed at 10:34 on 11/03/2009

ALcontrol Laboratories Ireland

Test Schedule

Ref Number: 09-B00801/01 **Sample Type: WATER**

Client: Kildare County Council Location:

Date of Receipt: 25/02/2009 Client Contact: CMcLaughlin

Client Ref: Kilcullen (Silliot Hill)

Detection Method				5 DAY ATU	Calculation	Filtration	Filtration	HPLC	ICP MS	ICP OES	ICP OES	IR	KONE	METER	METER	SPECTRO	SPECTRO
UKAS Accredited [Testing Laboratory] No. 1291				☐	☐			☐	☐			☐	☐	☐	☐	☐	☐
ALcontrol Reference	Sample Identity	Other ID	P / V	BOD Unfiltered	Total Oxidised Nitrogen as N	Faecal Coliforms*	Total Coliforms*	Total Phenols	Dissolved Iron Low Level	Dissolved Potassium	Dissolved Sodium	Total Organic Carbon	Chloride	Electrical Conductivity @ 25C	pH	Ammoniacal Nitrogen as N	COD Unfiltered
09-B00801-S0013-A01	KTK 20	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0013-A04	KTK 20	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0013-A12	KTK 20	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0013-A14	KTK 20	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-
09-B00801-S0014-A01	BH2	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0014-A04	BH2	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0014-A12	BH2	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0014-A14	BH2	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-
09-B00801-S0015-A01	BH3	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0015-A04	BH3	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0015-A12	BH3	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0015-A14	BH3	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-
09-B00801-S0016-A01	BH9D	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0016-A04	BH9D	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0016-A12	BH9D	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0016-A14	BH9D	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-
09-B00801-S0017-A01	BH13-07	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0017-A04	BH13-07	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0017-A12	BH13-07	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0017-A14	BH13-07	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-

Notes : NUMERIC VALUES INDICATE ADDITIONAL SCHEDULING

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

ALcontrol Laboratories Ireland

Test Schedule

Ref Number: 09-B00801/01 ***Sample Type: WATER***

Client: Kildare County Council *Location:*

Date of Receipt: 25/02/2009 *Client Contact: CMcLaughlin*

Client Ref: Kilcullen (Silliot Hill)

Detection Method				5 DAY ATU	Calculation	Filtration	Filtration	HPLC	ICP MS	ICP OES	ICP OES	IR	KONE	METER	METER	SPECTRO	SPECTRO
UKAS Accredited [Testing Laboratory] No. 1291				☐	☐			☐	☐			☐	☐	☐	☐	☐	☐
ALcontrol Reference	Sample Identity	Other ID	P / V	BOD Unfiltered	Total Oxidised Nitrogen as N	Faecal Coliforms*	Total Coliforms*	Total Phenols	Dissolved Iron Low Level	Dissolved Potassium	Dissolved Sodium	Total Organic Carbon	Chloride	Electrical Conductivity @ 25C	pH	Ammoniacal Nitrogen as N	COD Unfiltered
09-B00801-S0018-A01	L3	25/02/2009	Plastic Bottle	X	X	-	-	-	-	-	-	-	X	X	X	-	X
09-B00801-S0018-A08	L3	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0019-A01	L4	25/02/2009	Plastic Bottle	X	X	-	-	-	-	-	-	-	X	X	X	-	X
09-B00801-S0019-A08	L4	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0020-A01	Kilsaran 1	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0020-A04	Kilsaran 1	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0020-A12	Kilsaran 1	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0020-A14	Kilsaran 1	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-
09-B00801-S0021-A01	Kilsaran 2	25/02/2009	250ml Sterile	-	-	X	X	-	-	-	-	-	-	-	-	-	-
09-B00801-S0021-A04	Kilsaran 2	25/02/2009	Plastic Bottle	-	X	-	-	-	X	X	X	X	X	X	X	-	-
09-B00801-S0021-A12	Kilsaran 2	25/02/2009	Plastic Bottle + H2SO4	-	-	-	-	-	-	-	-	-	-	-	-	X	-
09-B00801-S0021-A14	Kilsaran 2	25/02/2009	Glass Bottle + NaOH	-	-	-	-	X	-	-	-	-	-	-	-	-	-

Notes : *NUMERIC VALUES INDICATE ADDITIONAL SCHEDULING*

ALcontrol Laboratories Ireland

Test Schedule Summary

Ref Number: 09-B00801/01 **Sample Type:** WATER
Client: Kildare County Council Location:
Date of Receipt: 25/02/2009 Client Contact: CMcLaughlin
Client Ref: Kilcullen (Silliot Hill)

** SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY*

SCHEDULE	METHOD	TEST NAME	TOTAL
X	5 DAY ATU	BOD Unfiltered	2
X	Calculation	Total Oxidised Nitrogen	9
X	Filtration	Faecal Coliforms*	7
X	Filtration	Total Coliforms*	7
X	HPLC	Total Phenols by HPLC	7
X	ICP MS	Dissolved Iron Low Level	7
X	ICP OES	Dissolved Potassium	7
X	ICP OES	Dissolved Sodium	7
X	IR	Total Organic Carbon	7
X	KONE	Chloride	9
X	METER	Electrical Conductivity @ 25C	9
X	METER	pH (Liquid)	9
X	SPECTRO	Ammoniacal Nitrogen	9
X	SPECTRO	COD Unfiltered	2

☐ Interim
☐ Validated

ALcontrol Laboratories Ireland

Table Of Results

Ref Number: 09-B00801/01 **Sample Type: WATER**

Client: Kildare County Council Location:

Date of Receipt: 25/02/2009 Client Contact: CMcLaughlin

(of first sample) Client Ref: Kilcullen (Silliot Hill)

	Detection Method	5 DAY ATU	Calculation	Filtration	Filtration	HPLC	ICP MS	ICP OES	ICP OES	IR	KONE	METER	METER	SPECTRO	SPECTRO	
	Method Detection Limit	<2mg/l	<0.3mg/l	<1cfu/100ml	<1cfu/100ml	<0.01mg/l	<2ug/l	<0.2mg/l	<0.2mg/l	<2mg/l	<1mg/l	<0.014mS/cm	napH Units	<0.2mg/l	<15mg/l	
UKAS Accredited [Testing Laboratory] No. 1291		☐	☐			☐	☐			☐	☐	☐	☐	☐	☐	
ALcontrol Reference	Sample Identity	Other ID	BOD Unfiltered	Total Oxidised Nitrogen as N	Faecal Coliforms*	Total Coliforms*	Total Phenols	Dissolved Iron Low Level	Dissolved Potassium	Dissolved Sodium	Total Organic Carbon	Chloride	Electrical Conductivity @ 25C	pH	Ammoniacal Nitrogen as N	COD Unfiltered	
			mg/l	mg/l	cfu/100ml	cfu/100ml	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	mS/cm	pH Units	mg/l	mg/l	
09-B00801-S0013	KTK 20	25/02/2009	-	0.3	<1	12	<0.01	41	2.3	40.1	<2	14	0.654	7.70	<0.2	-	
09-B00801-S0014	BH2	25/02/2009	-	<0.3	1	400	<0.01	39	4.1	28.3	4	19	0.723	7.65	0.7	-	
09-B00801-S0015	BH3	25/02/2009	-	2.4	<1	300	<0.01	56	1.0	9.2	2	21	0.777	7.21	1.7	-	
09-B00801-S0016	BH9D	25/02/2009	-	7.7	<1	17	<0.01	45	8.7	77.9	3	150	1.223	7.38	<0.2	-	
09-B00801-S0017	BH13-07	25/02/2009	-	6.1	<1	2300	<0.01	45	1.2	10.7	<2	20	0.683	7.59	<0.2	-	
09-B00801-S0018	L3	25/02/2009	7	<0.3	-	-	-	-	-	-	-	142	1.319	7.32	44.6	43	
09-B00801-S0019	L4	25/02/2009	2	<0.3	-	-	-	-	-	-	-	143	2.280	7.20	96.3	57	
09-B00801-S0020	Kilsaran 1	25/02/2009	-	10.0	<1	<1	<0.01	62	1.2	8.5	<2	22	0.737	7.39	0.4	-	
09-B00801-S0021	Kilsaran 2	25/02/2009	-	9.9	<1	3	<0.01	57	1.2	8.4	<2	22	0.736	7.31	<0.2	-	

Notes : METHOD DETECTION LIMITS ARE NOT ALWAYS ACHIEVABLE DUE TO VARIOUS CIRCUMSTANCES BEYOND OUR CONTROL. **NDP** = NO DETERMINATION POSSIBLE

Checked By : Mark Butler

* SUBCONTRACTED TO OTHER LABORATORY / ** SAMPLES ANALYSED AT THE CHESTER LABORATORY

APPENDIX

APPENDIX

1. *Results are expressed as mg/kg dry weight (dried at 30°C) on all soil analyses except for the following: NRA Leach tests, flash point, and ammoniacal N_2 by the BRE method, VOC, PRO, Cyanide, Acid Soluble Sulphide,TPH by IR, OFGs and SEM.*

2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*

3. *A sub sample of all samples received will be retained free of charge for one month for soils and one month for waters (sample size permitting), but may then be discarded unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage.*

4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*

5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*

6. *When requested, an asbestos screen is done in-house on soils and if no fibres are found will be reported as NFD – no fibres detected. If fibres are detected, then identification and quantification is carried out by ALcontrol Technichem or Alcontrol Shutlers in the UK . If a sample is suspected of containing asbestos, then drying and crushing will be suspended on that sample until the asbestos results are known. If asbestos is present, then no analysis requiring dry sample are undertaken.*

7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace is present in the volatile sample.*

8. *NDP – No Determination Possible due to insufficient/unsuitable sample.*

9. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*

10. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*

Last updated February 2005

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Your Reference:

Location:

Kildare County Council
Water Services
Aras Cilldara
Devoy Park
Naas
Co.Kildare

Attention: *Claire McLoughlin*

CERTIFICATE OF ANALYSIS

Date: *26 June 2009*

Job: *D_KILCC_NAS-1*

SDG Reference: *090527-59* ***Report No.:*** *58125*

A total of 11 samples was received on Tuesday May 26, 2009 and completed on Tuesday June 23, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occuring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample . Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Declan Burns
Lab Manager

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Sample ID	Depth	Container	Sample Type	Ammonium All	Anions by Kone All	BOD Unfiltered All	COD Unfiltered All	Coliforms (W) All	Conductivity (at 20 deg.C) All	Metals by ICap-OES Dissolved (W) All	pH Value All	Phenols by HPLC (W) All	Total Organic and Inorganic Carbon All	Total Suspended Solids All
KTK20		PLAS BOT (D)	LIQUID		X				X	X	X	X	X	
		H2SO4 (Dublin)	LIQUID	X										
		250ml Sterile (D)	LIQUID					X						
PW11		PLAS BOT (D)	LIQUID		X				X	X	X	X	X	
		H2SO4 (Dublin)	LIQUID	X										
		250ml Sterile (D)	LIQUID					X						
PW2-09		PLAS BOT (D)	LIQUID		X				X	X	X	X	X	
		H2SO4 (Dublin)	LIQUID	X										
		250ml Sterile (D)	LIQUID					X						
PW4		PLAS BOT (D)	LIQUID		X				X	X	X	X	X	
		H2SO4 (Dublin)	LIQUID	X										
		250ml Sterile (D)	LIQUID					X						
PW9		PLAS BOT (D)	LIQUID						X	X	X	X	X	
		Glass NaOH (D)	LIQUID	X	X									
		250ml Sterile (D)	LIQUID					X						
SW 3		PLAS BOT (D)	LIQUID		X	X			X		X			X
		H2SO4 (Dublin)	LIQUID	X										
SW 4		PLAS BOT (D)	LIQUID		X	X			X		X			X
		H2SO4 (Dublin)	LIQUID	X										
SW 6		PLAS BOT (D)	LIQUID		X	X			X		X			X
		H2SO4 (Dublin)	LIQUID	X										
SW 7		PLAS BOT (D)	LIQUID		X	X			X		X			X
		H2SO4 (Dublin)	LIQUID	X										
SW1		PLAS BOT (D)	LIQUID		X	X	X		X		X			X
		H2SO4 (Dublin)	LIQUID	X										
SW2		PLAS BOT (D)	LIQUID		X	X			X		X			X
		H2SO4 (Dublin)	LIQUID	X										

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Table of Results

Ammonium

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
Ammoniacal Nitrogen as N	<0.2	mg/l as N	TM099	0.239 #	<0.200 #	<0.200 #	<0.200 #

Ammonium

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				PW9	SW 3	SW 4	SW 6
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256980	256743	256753	256762
	LoD	Units	Method				
Ammoniacal Nitrogen as N	<0.2	mg/l as N	TM099	<0.200 #	<0.200 #	<0.200 #	<0.200 #

Ammonium

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				SW 7	SW1	SW2
Depth(m)						
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59
Sample Ref				256769	256726	256733
	LoD	Units	Method			
Ammoniacal Nitrogen as N	<0.2	mg/l as N	TM099	<0.200 #	0.732 #	<0.200 #

Anions by Kone

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
Chloride	<1	mg/l	TM184	12.9	8.50	32.0	20.7
Total Oxidised Nitrogen as N	<0.3	mg/l	TM184	<0.300	0.913	11.2	5.40

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Anions by Kone

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				PW9	SW 3	SW 4	SW 6
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256980	256743	256753	256762
	LoD	Units	Method				
Chloride	<1	mg/l	TM184	12.0	12.0	5.20	11.7
Total Oxidised Nitrogen as N	<0.3	mg/l	TM184	1.14			

Anions by Kone

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				SW 7	SW1	SW2
Depth(m)						
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59
Sample Ref				256769	256726	256733
	LoD	Units	Method			
Chloride	<1	mg/l	TM184	9.80	110	74.5

BOD Unfiltered

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				SW 3	SW 4	SW 6	SW 7
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256743	256753	256762	256769
	LoD	Units	Method				
BOD	<1	mg/l O	TM045	<1.00 #	5.54 #	<1.00 #	<1.00 #

BOD Unfiltered

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				SW1	SW2
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59
Sample Ref				256726	256733
	LoD	Units	Method		
BOD	<1	mg/l O	TM045	<1.00 #	<1.00 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

COD Unfiltered

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				SW 3	SW 4	SW 6	SW 7
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256743	256753	256762	256769
	LoD	Units	Method				
COD	7	mg/l O	TM107	16.9 #	206 #	13.8 #	16.5 #

COD Unfiltered

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				SW1	SW2
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59
Sample Ref				256726	256733
	LoD	Units	Method		
COD	7	mg/l O	TM107	18.1 #	16.5 #

Coliforms (W)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
E.coli (on liquids)		CFU/100ml		0 #	10000 #	1 #	17 #
Total Coliforms (W)		CFU/100ml		0 #	10000 #	1 #	23 #

Coliforms (W)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				PW9
Depth(m)				
Sample Type				Water(GW/SW)
Sample received date				26/05/2009
Sampled date				26/05/2009
SDG Ref				090527-59
Sample Ref				256980
	LoD	Units	Method	
E.coli (on liquids)		CFU/100ml		0 #
Total Coliforms (W)		CFU/100ml		0 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
Conductivity filtered (at 20 deg.C)	<0.014	mS/cm	TM120	0.697 #	0.373 #	0.760 #	0.663 #

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				PW9	SW 3	SW 4	SW 6
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256980	256743	256753	256762
	LoD	Units	Method				
Conductivity filtered (at 20 deg.C)	<0.014	mS/cm	TM120	0.696 #	0.665 #	0.245 #	0.279 #

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				SW 7	SW1	SW2
Depth(m)						
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59
Sample Ref				256769	256726	256733
	LoD	Units	Method			
Conductivity filtered (at 20 deg.C)	<0.014	mS/cm	TM120	0.262 #	1.10 #	0.902 #

Metals by iCap-OES Dissolved (W)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
Iron Dissolved	0.019	mg/l	TM228	<0.0190	<0.0190	<0.0190	<0.0190
Potassium Dissolved	2.335	mg/l	TM228	<2.34	3.92	<2.34	<2.34
Sodium Dissolved	0.076	mg/l	TM228	19.4	8.98	21.2	182

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Metals by iCap-OES Dissolved (W)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				PW9
Depth(m)				
Sample Type				Water(GW/SW)
Sample received date				26/05/2009
Sampled date				26/05/2009
SDG Ref				090527-59
Sample Ref				256980
	LoD	Units	Method	
Iron Dissolved	0.019	mg/l	TM228	<0.0190
Potassium Dissolved	2.335	mg/l	TM228	<2.34
Sodium Dissolved	0.076	mg/l	TM228	8.31

pH Value

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
pH value	<1.00	pH Units	TM133	7.63 #	8.27 #	8.20 #	8.39 #

pH Value

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				PW9	SW 3	SW 4	SW 6
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256980	256743	256753	256762
	LoD	Units	Method				
pH value	<1.00	pH Units	TM133	7.93 #	8.38 #	7.90 #	8.21 #

pH Value

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				SW 7	SW1	SW2
Depth(m)						
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59
Sample Ref				256769	256726	256733
	LoD	Units	Method			
pH value	<1.00	pH Units	TM133	8.20 #	8.23 #	8.18 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
2.3.5 Trimethyl-Phenol	<0.003	mg/l	TM062	<0.00300 #	<0.00300 #	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/l	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/l	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/l	TM062	<0.00200 #	<0.00200 #	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/l	TM062	<0.0250	<0.0250	<0.0250	<0.0250
Xylenols	<0.008	mg/l	TM062	<0.00800 #	<0.00800 #	<0.00800 #	<0.00800 #

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID				PW9
Depth(m)				
Sample Type				Water(GW/SW)
Sample received date				26/05/2009
Sampled date				26/05/2009
SDG Ref				090527-59
Sample Ref				256980
	LoD	Units	Method	
2.3.5 Trimethyl-Phenol	<0.003	mg/l	TM062	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/l	TM062	<0.00600 #
Cresols	<0.006	mg/l	TM062	<0.00600 #
Phenol	<0.002	mg/l	TM062	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/l	TM062	<0.0250
Xylenols	<0.008	mg/l	TM062	<0.00800 #

Total Organic and Inorganic Carbon

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				KTK20	PW11	PW2-09	PW4
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date				26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref				090527-59	090527-59	090527-59	090527-59
Sample Ref				256990	256987	256778	256977
	LoD	Units	Method				
Total Organic Carbon	<3	mg/l	TM090	<3.00 #	<3.00 #	<3.00 #	<3.00 #
~~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58125

Total Organic and Inorganic Carbon

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID			PW9
Depth(m)			
Sample Type			Water(GW/SW)
Sample received date			26/05/2009
Sampled date			26/05/2009
SDG Ref			090527-59
Sample Ref			256980
	LoD	Units	Method	
Total Organic Carbon	<3	mg/l	TM090	<3.00 #

Total Suspended Solids

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
** sub contracted test.*

Sample ID			SW 3	SW 4	SW 6	SW 7
Depth(m)						
Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date			26/05/2009	26/05/2009	26/05/2009	26/05/2009
Sampled date			26/05/2009	26/05/2009	26/05/2009	26/05/2009
SDG Ref			090527-59	090527-59	090527-59	090527-59
Sample Ref			256743	256753	256762	256769
	LoD	Units	Method				
Total Suspended Solids	<2	mg/l	TM022	12.5 #	118 #	2.00 #	4.50 #

Total Suspended Solids

Results Legend
~~~~~~~~~~~~
 # ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID			SW1	SW2
Depth(m)				
Sample Type			Water(GW/SW)	Water(GW/SW)
Sample received date			26/05/2009	26/05/2009
Sampled date			26/05/2009	26/05/2009
SDG Ref			090527-59	090527-59
Sample Ref			256726	256733
	LoD	Units	Method		
Total Suspended Solids	<2	mg/l	TM022	3.50 #	5.00 #
~~~~~~~~~~~~

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-1 **Customer:** Kildare County Council

Client Reference: **Attention:** Claire McLoughlin

Location: **Order No.:** 400236526 **Report No:** 58126

Test Completion dates

SDG reference: 090527-59

Sample ID	Depth	Type	Ammonium	Anions by Kone	BOD Unfiltered	COD Unfiltered	Coliforms (W)	Conductivity (at 20 deg.C)	Metals by iCap-OES Dissolved (W)	pH Value	Phenols by HPLC (W)	Total Organic and Inorganic Carbon	Total Suspended Solids
KTK20		LIQUID	29/05/2009	28/05/2009			09/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009	29/05/2009	
PW11		LIQUID	29/05/2009	23/06/2009			10/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009	29/05/2009	
PW2-09		LIQUID	29/05/2009	01/06/2009			10/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009	29/05/2009	
PW4		LIQUID	04/06/2009	04/06/2009			10/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009	29/05/2009	
PW9		LIQUID	29/05/2009	01/06/2009			10/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009	29/05/2009	
SW 3		LIQUID	29/05/2009	28/05/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009			29/05/2009
SW 4		LIQUID	29/05/2009	28/05/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009			29/05/2009
SW 6		LIQUID	29/05/2009	28/05/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009			29/05/2009
SW 7		LIQUID	29/05/2009	28/05/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009			29/05/2009
SW1		LIQUID	29/05/2009	01/06/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009			01/06/2009
SW2		LIQUID	29/05/2009	28/05/2009	04/06/2009	29/05/2009		01/06/2009		29/05/2009			29/05/2009

APPENDIX

APPENDIX

1. *Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.*
2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*
3. *If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.*
4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*
5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*
6. *When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.*
7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.*
8. *If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.*
9. *NDP – No determination possible due to insufficient/unsuitable sample.*
10. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*
11. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*
12. ***Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.*
13. ***Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.*
14. *Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).*
15. *Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).*
16. *Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.*
17. *Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.*
18. *In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.*
19. *Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.*
20. *For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.*
21. *For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.*
22. *We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.*
23. *Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.*

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
EPH	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
EPH CWG	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
MINERAL OIL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
PCB 7 CONGENERS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
PCB TOTAL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GS MS*
SVOC	*DCM*	*LIQUID/LIQUID SHAKEN SVOC*	*GC MS*
FREE SULPHUR	*DCM*	*SOLID PHASE EXTRACTION*	*HPLC*
PEST OCP/OPP	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
TRIAZINE HERBS	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
PHENOLS MS	*DCM*	*SOLID PHASE EXTRACTION*	*GC MS*
TPH by INFRA RED (IR)	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
MINERAL OIL by IR	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
SAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
UNSAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
GLYCOLS	*DCM*	*LIQUID/LIQUID EXTRACTION*	*EZ FLASH*

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	*D&C*	*DCM*	*SOXTHERM*	*GRAVIMETRIC*
Cyclohexane Ext. Matter	*D&C*	*CYCLOHEXANE*	*SOXTHERM*	*GRAVIMETRIC*
Thin Layer Chromatography	*D&C*	*DCM*	*SOXTHERM*	*IATROSCAN*
Elemental Sulphur	*D&C*	*DCM*	*SOXTHERM*	*HPLC*
Phenols by GCMS	*WET*	*DCM*	*SOXTHERM*	*GC-MS*
Herbicides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
Pesticides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
EPH (DRO)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Min oil)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Cleaned up)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH CWG by GC	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
PCB tot / PCB con	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-MS*
Polyaromatic Hydrocarbons (MS)	*WET*	*HEXANE:ACETONE*	*Microwave TM218.*	*GC-MS*
C8-C40 (C6-C40)EZ Flash	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Polyaromatic Hydrocarbons Rapid GC	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Semi Volatile Organic Compounds	*WET*	*DCM:ACETONE*	*SONICATE*	*GC-MS*

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Kildare County Council
Leixlip Sewage Treatment Plant
Black Avenue
St. Catherine's Park
Leixlip
Co. Kildare

Attention: *Claire McLaughlin*

CERTIFICATE OF ANALYSIS

Date:	*09 June 2009*		
Job:	*D_KILCC_LXP-1*		
SDG Reference:	*090528-47*	***Report No.:***	*57538*
Your Reference:	*Silliot Hill*		
Location:	*Silliot Hill*		

A total of 10 samples was received on Wednesday May 27, 2009 and completed on Tuesday June 09, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occuring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample. Asbestos testing - we are not accredited for screen testing of asbestos fibres. We are only accredited for asbestos containing materials found in bulk samples.Approved By:

Declan Burns
Lab Manager

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council

Client Reference: Silliot Hill **Attention:** Claire McLaughlin

Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

Sample ID	Depth	Container	Sample Type	Ammonium	Anions by Kone	BOD Unfiltered	COD Unfiltered	Coliforms (W)	Conductivity (at 20 deg.C)	Metals by ICap-OES Dissolved (W)	pH Value	Phenols by HPLC (W)	Total Organic and Inorganic Carbon
				All	All	All	All	All	All	All	All	All	All
BH1		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
		Micro	LIQUID					X					
BH10D		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
		Micro	LIQUID					X					
BH13-07		Micro	LIQUID					X					
		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
BH3		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
		Micro	LIQUID					X					
BH4-07		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
		Micro	LIQUID					X					
BH9D		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
		Micro	LIQUID					X					
GWR1		Glass NaOH (D)	LIQUID									X	
		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X		X
		Micro	LIQUID					X					
GWR2		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X				X	X	X	X	X
		Micro	LIQUID					X					
L3		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X	X	X		X		X		
L4		H2SO4 (Dublin)	LIQUID	X									
		PLAS BOT (D)	LIQUID		X	X	X		X		X		

09/06/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council
Client Reference: Silliot Hill **Attention:** Claire McLaughlin
Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

Table of Results

Ammonium

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH1	BH10D	BH13-07	BH3
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258512	258579	258589	258534
	LoD	Units	Method				
Ammoniacal Nitrogen as N	<0.2	mg/L as N	TM099	0.231 #	<0.200 #	<0.200 #	2.17 #

Ammonium

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258561	258568	258598	258608
	LoD	Units	Method				
Ammoniacal Nitrogen as N	<0.2	mg/L as N	TM099	220 #	0.235 #	<0.200 #	<0.200 #

Ammonium

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				L3	L4
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47
Sample Ref				258625	258631
	LoD	Units	Method		
Ammoniacal Nitrogen as N	<0.2	mg/L as N	TM099	42.3 #	64.4 #

Anions by Kone

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH1	BH10D	BH13-07	BH3
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258512	258579	258589	258534
	LoD	Units	Method				
Chloride	<1	mg/l	TM184	74.0	43.7	18.4	18.3
Total Oxidised Nitrogen as N	<0.3	mg/L	TM184	3.16	6.77	6.10	0.333

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council
Client Reference: Silliot Hill **Attention:** Claire McLaughlin
Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

Anions by Kone

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258561	258568	258598	258608
	LoD	Units	Method				
Chloride	<1	mg/l	TM184	353	174	12.0	19.4
Total Oxidised Nitrogen as N	<0.3	mg/L	TM184	<0.300	4.77	1.99	2.21

Anions by Kone

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				L3	L4
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47
Sample Ref				258625	258631
	LoD	Units	Method		
Chloride	<1	mg/l	TM184	88.8	71.8
Total Oxidised Nitrogen as N	<0.3	mg/L	TM184	0.911	<0.300

BOD Unfiltered

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				L3	L4
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47
Sample Ref				258625	258631
	LoD	Units	Method		
BOD	<1	mg/L O	TM045	2.34 #	2.19 #

COD Unfiltered

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				L3	L4
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47
Sample Ref				258625	258631
	LoD	Units	Method		
COD	7	mg/L O	TM107	46.1 #	65.0 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council
Client Reference: Silliot Hill **Attention:** Claire McLaughlin
Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

Coliforms (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH1	BH10D	BH13-07	BH3
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258512	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258579	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258589	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258534
	LoD	Units	Method				
E.coli (on liquids)		CFU/100ml		0 #	0 #	0 #	0 #
Total Coliforms (W)		CFU/100ml		1 #	0 #	0 #	0 #

Coliforms (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258561	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258568	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258598	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258608
	LoD	Units	Method				
E.coli (on liquids)		CFU/100ml		0 #	0 #	0 #	1 #
Total Coliforms (W)		CFU/100ml		100 #	1 #	24 #	4 #

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH1	BH10D	BH13-07	BH3
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258512	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258579	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258589	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258534
	LoD	Units	Method				
Conductivity (at 20 deg.C)	<0.01 4	mS/cm	TM120	0.862 #	0.622 #	0.632 #	0.695 #

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258561	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258568	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258598	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258608
	LoD	Units	Method				
Conductivity (at 20 deg.C)	<0.01 4	mS/cm	TM120	3.76 #	1.19 #	0.725 #	0.611 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council
Client Reference: Silliot Hill **Attention:** Claire McLaughlin
Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			L3	L4
	Depth(m)				
	Sample Type			Water(GW/SW)	Water(GW/SW)
	Sample received date			27/05/2009	27/05/2009
	Sampled date			27/05/2009	27/05/2009
	SDG Ref			090528-47	090528-47
	Sample Ref			258625	258631
	LoD	Units	Method		
Conductivity (at 20 deg.C)	<0.01 4	mS/cm	TM120	1.37 #	1.74 #

Metals by iCap-OES Dissolved (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			BH1	BH10D	BH13-07	BH3
	Depth(m)						
	Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
	Sample received date			27/05/2009	27/05/2009	27/05/2009	27/05/2009
	Sampled date			27/05/2009	27/05/2009	27/05/2009	27/05/2009
	SDG Ref			090528-47	090528-47	090528-47	090528-47
	Sample Ref			258512	258579	258589	258534
	LoD	Units	Method				
Iron Dissolved	0.019	mg/L	TM228	0.158	0.160	0.158	0.159
Potassium Dissolved	2.335	mg/l	TM228	3.37	3.07	2.85	3.08
Sodium Dissolved	0.076	mg/l	TM228	29.7	27.9	12.4	11.3

Metals by iCap-OES Dissolved (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			BH4-07	BH9D	GWR1	GWR2
	Depth(m)						
	Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
	Sample received date			27/05/2009	27/05/2009	27/05/2009	27/05/2009
	Sampled date			27/05/2009	27/05/2009	27/05/2009	27/05/2009
	SDG Ref			090528-47	090528-47	090528-47	090528-47
	Sample Ref			258561	258568	258598	258608
	LoD	Units	Method				
Iron Dissolved	0.019	mg/L	TM228	0.297	0.159	0.158	0.161
Potassium Dissolved	2.335	mg/l	TM228	118	9.88	2.89	3.38
Sodium Dissolved	0.076	mg/l	TM228	351	80.6	12.2	10.3

pH Value

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

	Sample ID			BH1	BH10D	BH13-07	BH3
	Depth(m)						
	Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
	Sample received date			27/05/2009	27/05/2009	27/05/2009	27/05/2009
	Sampled date			27/05/2009	27/05/2009	27/05/2009	27/05/2009
	SDG Ref			090528-47	090528-47	090528-47	090528-47
	Sample Ref			258512	258579	258589	258534
	LoD	Units	Method				
pH value	<1.00	pH Units	TM133	7.78 #	7.47 #	7.49 #	7.70 #

09/06/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council
Client Reference: Silliot Hill **Attention:** Claire McLaughlin
Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

pH Value

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258561	258568	258598	258608
	LoD	Units	Method				
pH value	<1.00	pH Units	TM133	7.71 #	7.61 #	7.28 #	7.49 #

pH Value

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				L3	L4
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47
Sample Ref				258625	258631
	LoD	Units	Method		
pH value	<1.00	pH Units	TM133	7.91 #	7.81 #

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH1	BH10D	BH13-07	BH3
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258512	258579	258589	258534
	LoD	Units	Method				
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #	<0.00200 #	<0.00200 #
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #	<0.00800 #	<0.00800 #

Phenols by HPLC (W)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
Sampled date				27/05/2009	27/05/2009	27/05/2009	27/05/2009
SDG Ref				090528-47	090528-47	090528-47	090528-47
Sample Ref				258561	258568	258598	258608
	LoD	Units	Method				
2.3.5 Trimethyl-Phenol	<0.003	mg/L	TM062	<0.00300 #	<0.00300 #	<0.00300 #	<0.00300 #
2-Isopropyl Phenol	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Cresols	<0.006	mg/L	TM062	<0.00600 #	<0.00600 #	<0.00600 #	<0.00600 #
Phenol	<0.002	mg/L	TM062	<0.00200 #	<0.00200 #	<0.00200 #	<0.00200 #

09/06/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council
Client Reference: Silliot Hill **Attention:** Claire McLaughlin
Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

				BH4-07	BH9D	GWR1	GWR2
				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258561	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258568	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258598	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258608
Phenols Total of 5 Speciated	<0.025	mg/L	TM062	<0.0250	<0.0250	<0.0250	<0.0250
Xylenols	<0.008	mg/L	TM062	<0.00800 #	<0.00800 #	<0.00800 #	<0.00800 #

Total Organic and Inorganic Carbon

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH1	BH10D	BH13-07	BH3
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258512	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258579	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258589	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258534
	LoD	Units	Method				
Total Organic Carbon	<3	mg/L	TM090	<3.00 #	<3.00 #	<3.00 #	<3.00 #

Total Organic and Inorganic Carbon

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.

Sample ID				BH4-07	BH9D	GWR1	GWR2
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258561	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258568	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258598	Water(GW/SW) 27/05/2009 27/05/2009 090528-47 258608
	LoD	Units	Method				
Total Organic Carbon	<3	mg/L	TM090	67.5 #	3.76 #	<3.00 #	<3.00 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_LXP-1 **Customer:** Kildare County Council

Client Reference: Silliot Hill **Attention:** Claire McLaughlin

Location: Silliot Hill **Order No.:** 400236526 **Report No:** 57538

Test Completion dates

SDG reference: 090528-47

Sample ID	Depth	Type	Ammonium	Anions by Kone	BOD Unfiltered	COD Unfiltered	Coliforms (W)	Conductivity (at 20 deg.C)	Metals by iCap-OES Dissolved (W)	pH Value	Phenols by HPLC (W)	Total Organic and Inorganic Carbon
BH1		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
BH10D		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
BH13-07		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
BH3		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
BH4-07		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
BH9D		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
GWR1		LIQUID	02/06/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	29/05/2009	29/05/2009
GWR2		LIQUID	29/05/2009	01/06/2009			09/06/2009	01/06/2009	01/06/2009	29/05/2009	01/06/2009	
L3		LIQUID	29/05/2009	01/06/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009		
L4		LIQUID	29/05/2009	01/06/2009	04/06/2009	30/05/2009		01/06/2009		29/05/2009		

APPENDIX

APPENDIX

1. *Results are expressed on a dry weight basis (dried at 35□C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.*
2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*
3. *If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.*
4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*
5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*
6. *When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no analysis will be undertaken. At no point is the fibre content of the soil sample determined.*
7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.*
8. *If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.*
9. *NDP – No determination possible due to insufficient/unsuitable sample.*
10. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*
11. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*
12. ***Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored, but not corrected or reported.*
    For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.
13. ***Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.*
14. *Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).*
15. *Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).*
16. *Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.*
17. *Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.*
18. *In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.*
19. *Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.*
20. *For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.*
21. *For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.*
22. *We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.*
23. *Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.*

Last updated June 2009

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
EPH	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
EPH CWG	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
MINERAL OIL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
PCB 7 CONGENERS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
PCB TOTAL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GS MS*
SVOC	*DCM*	*LIQUID/LIQUID SHAKEN SVOC*	*GC MS*
FREE SULPHUR	*DCM*	*SOLID PHASE EXTRACTION*	*HPLC*
PEST OCP/OPP	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
TRIAZINE HERBS	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
	DCM	*SOLID PHASE EXTRACTION*	*GC MS*
PHENOLS MS	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
TPH by INFRA RED (IR)	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
MINERAL OIL by IR	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
SAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
UNSAPONIFIABLE	*DCM*	*LIQUID/LIQUID EXTRACTION*	*EZ FLASH*
GLYCOLS			

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	*D&C*	*DCM*	*SOXTHERM*	*GRAVIMETRIC*
Cyclohexane Ext. Matter	*D&C*	*CYCLOHEXANE*	*SOXTHERM*	*GRAVIMETRIC*
Thin Layer Chromatography	*D&C*	*DCM*	*SOXTHERM*	*IATROSCAN*
Elemental Sulphur	*D&C*	*DCM*	*SOXTHERM*	*HPLC*
Phenols by GCMS	*WET*	*DCM*	*SOXTHERM*	*GC-MS*
Herbicides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
Pesticides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
EPH (DRO)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Min oil)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Cleaned up)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH CWG by GC	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
PCB tot / PCB con	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
Polyaromatic Hydrocarbons (MS)	*D&C*	*HEXANE:ACETONE*	*Microwave TM218.*	*GC-MS*
C8-C40 (C6-C40)EZ Flash	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Polyaromatic Hydrocarbons Rapid GC	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Semi Volatile Organic Compounds	*WET*	*DCM:ACETONE*	*SONICATE*	*GC-MS*

Last updated June 2009

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Kildare County Council
Water Services
Aras Cilldara
Devoy Park
Naas
Co.Kildare

Attention: *Claire McLaughlin*

CERTIFICATE OF ANALYSIS

Date:	*20 October 2009*		
Job:	*D_KILCC_NAS-3*		
Sample Delivery Group (SDG):	*090921-36*	***Report No.:***	*63444*
Your Reference:			
Location:	*Silliot Hill Landfill 21/9/9*		

A total of 9 samples was received on Monday September 21, 2009 and completed on Tuesday September 29, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories. Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).Approved By:

Chris Crutchley
Operations Director - Land UK & I

Validated

ALcontrol Laboratories Analytical Services

SDG:	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	63444

Results Legend

X Test

N No Determination Possible

Sample ID		PW2-09					PW4					PW9					SW1		SW2		SW3		SW4		SW6		SW7		Total
Depth																												
Container		1l glass bottle (D)	60g VOC Dublin	H2SO4 (Dublin)	PLAS BOT (D)	Plastic NaOH (D)	1l glass bottle (D)	60g VOC Dublin	H2SO4 (Dublin)	PLAS BOT (D)	Plastic NaOH (D)	1l glass bottle (D)	60g VOC Dublin	H2SO4 (Dublin)	PLAS BOT (D)	Plastic NaOH (D)	H2SO4 (Dublin)	PLAS BOT (D)	H2SO4 (Dublin)	PLAS BOT (D)	H2SO4 (Dublin)	PLAS BOT (D)	H2SO4 (Dublin)	PLAS BOT (D)	H2SO4 (Dublin)	PLAS BOT (D)	H2SO4 (Dublin)	PLAS BOT (D)	
Sample Type		LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	
Alkalinity as CaCO3	All				X					X					X			X		X		X		X		X		X	09
Ammonium	All			X					X					X			X		X		X		X		X		X		09
Anions by Kone (w)	All				X					X					X			X		X		X		X		X		X	09
BOD Unfiltered	All																	X		X		X		X		X		X	06
COD Unfiltered	All																	X		X		X		X		X		X	06
Coliforms (W)	All	X					X					X																	03
Conductivity (at 20 deg.C)	All				X					X					X			X		X		X		X		X		X	09
Cyanide Complex/Free/Total/Thiocyan	All					X					X					X													03
Dissolved Metals by ICP-MS	All				X					X					X			X		X		X		X		X		X	09
Fluoride (w)	All				X					X					X														03
Mercury Dissolved	All	X					X					X						X		X		X		X		X		X	09
Metals by iCap-OES Dissolved (W)	All				X					X					X			X		X		X		X		X		X	09
pH Value	All				X					X					X			X		X		X		X		X		X	09
Phenols by HPLC (W)	All					X					X					X													03
SVOC MS (W) - Aqueous	All	X					X					X																	03
Total Organic and Inorganic Carbon	All	X					X					X																	03
Total Solids	All				X					X					X														03
Total Suspended Solids	All																	X		X		X		X		X		X	06
VOC MS (W)	All		X					X					X																03

Validated

ALcontrol Laboratories Analytical Services

SDG:	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	63444

Test Completion dates

SDG reference: 090921-36

Sample ID	Depth	Type	Alkalinity as CaCO3	Ammonium	Anions by Kone (w)	BOD Unfiltered	COD Unfiltered	Coliforms (W)	Conductivity (at 20 deg.C)	Cyanide Complex/Free/Total/Thiocyan	Dissolved Metals by ICP-MS	Fluoride	Mercury Dissolved	Metals by iCap-OES Dissolved (W)	pH Value	Phenols by HPLC (W)	SVOC MS (W) - Aqueous	Total Organic and Inorganic Carbon	Total Solids	Total Suspended Solids	VOC MS (W)
PW2-09		LIQUID	25/09/2009	25/09/2009	25/09/2009			29/09/2009	24/09/2009	23/09/2009	23/09/2009	22/09/2009	24/09/2009	23/09/2009	22/09/2009	23/09/2009	28/09/2009	22/09/2009	25/09/2009		25/09/2009
PW4		LIQUID	25/09/2009	25/09/2009	25/09/2009			29/09/2009	24/09/2009	23/09/2009	23/09/2009	22/09/2009	24/09/2009	23/09/2009	22/09/2009	23/09/2009	28/09/2009	22/09/2009	25/09/2009		25/09/2009
PW9		LIQUID	25/09/2009	25/09/2009	25/09/2009			29/09/2009	24/09/2009	23/09/2009	23/09/2009	22/09/2009	24/09/2009	23/09/2009	22/09/2009	23/09/2009	28/09/2009	22/09/2009	25/09/2009		25/09/2009
SW1		LIQUID	25/09/2009	25/09/2009	24/09/2009	27/09/2009	22/09/2009		24/09/2009		23/09/2009		24/09/2009	23/09/2009	22/09/2009					23/09/2009	
SW2		LIQUID	25/09/2009	25/09/2009	24/09/2009	27/09/2009	22/09/2009		24/09/2009		23/09/2009		24/09/2009	23/09/2009	22/09/2009					24/09/2009	
SW3		LIQUID	25/09/2009	25/09/2009	24/09/2009	27/09/2009	22/09/2009		24/09/2009		23/09/2009		24/09/2009	23/09/2009	22/09/2009					24/09/2009	
SW4		LIQUID	25/09/2009	25/09/2009	24/09/2009	27/09/2009	22/09/2009		24/09/2009		23/09/2009		24/09/2009	23/09/2009	22/09/2009					23/09/2009	
SW6		LIQUID	25/09/2009	25/09/2009	25/09/2009	27/09/2009	22/09/2009		24/09/2009		23/09/2009		24/09/2009	23/09/2009	22/09/2009					24/09/2009	
SW7		LIQUID	25/09/2009	25/09/2009	25/09/2009	27/09/2009	22/09/2009		24/09/2009		23/09/2009		24/09/2009	23/09/2009	22/09/2009					24/09/2009	

Validated

ALcontrol Laboratories Analytical Services

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

Results Legend

\# ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	PW2-09	PW4	PW9	SW1	SW2	SW3
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Sampled Date						
			Sample Received	21/09/2009	21/09/2009	21/09/2009	21/09/2009	21/09/2009	21/09/2009
			SDG Ref	090921-36	090921-36	090921-36	090921-36	090921-36	090921-36
			Sample Number(s)	493950	493969	494000	493880	493891	493902
E.coli (on liquids)	CFU/100ml	SUB		# 0	# 20	# 1			
Total Coliforms (W)	CFU/100ml	SUB		# 1	# 26	# 7			
Total Suspended Solids	<2 mg/l	TM022					# 4.5	# 4.5	# 71.5
Total Alkalinity as CaCO3	<2 mg/l	TM043		# 273	# 290	# 330	# 375	# 340	# 335
BOD	<1 mg/l O	TM045					# 1.16	# <1	# 1.31
Phenol	<0.002 mg/l	TM062		# <0.002	# <0.002	# <0.002			
Cresols	<0.006 mg/l	TM062		# <0.006	# <0.006	# <0.006			
Xylenols	<0.008 mg/l	TM062		# <0.008	# <0.008	# <0.008			
2.3.5 Trimethyl-Phenol	<0.003 mg/l	TM062		# <0.003	# <0.003	# <0.003			
2-Isopropyl Phenol	<0.006 mg/l	TM062		# <0.006	# <0.006	# <0.006			
Phenols Total of 5 Speciated	<0.025 mg/l	TM062		<0.025	<0.025	<0.025			
Total Organic Carbon	<3 mg/l	TM090		# <3	# <3	# <3			
Ammoniacal Nitrogen as N	<0.2 mg/l as	TM099		# <0.2	# <0.2	# <0.2	# 0.328	# <0.2	# <0.2
Fluoride	<0.5 mg/l	TM104		# <0.5	# <0.5	# <0.5			
COD	7 mg/l O	TM107					# 17.2	# 12.4	# 81.6
Conductivity (at 20 deg.C)	<0.014	TM120		# 0.658	# 0.6	# 0.653	# 1.09	# 0.875	# 0.644
Total Solids	<1 mg/l	TM139		444	386	416			
Cadmium Dissolved	<0.22 µg/l	TM152		# <0.22	# <0.22	# <0.22	# <0.22	# <0.22	# <0.22
Chromium Dissolved	<0.7 µg/l	TM152		# 5.63	# 5.79	# 6.76	# <0.7	# <0.7	# <0.7
Copper Dissolved	<1.6 µg/l	TM152		# 14	# 30.4	# 1.97	# 2.39	# <1.6	# <1.6
Lead Dissolved	<0.4 µg/l	TM152		# 0.794	# 0.671	# <0.4	# 0.597	# 0.471	# <0.4
Manganese Dissolved	<0.6 µg/l	TM152		# <0.6	# 1.94	# <0.6	# 10.6	# 19.8	# 116
Zinc Dissolved	<5 µg/l	TM152		# 22.7	# 55	# 9.42	# 8.98	# <5	# <5
Mercury Dissolved	<0.01 µg/l	TM183		# <0.01	# <0.01	# <0.01	# <0.01	# <0.01	# <0.01
Sulphate (soluble)	3 mg/l	TM184		# 36.9	# 11.9	# 10.9	# 16.1	# 18.6	# 13.1
Chloride	<2 mg/l	TM184		# 22.4	# 17.6	# 11.9	# 142	# 86.7	# 16.4
Phosphate (ortho as PO4)	<0.08 mg/l	TM184		# <0.08	# <0.08	# <0.08	# 0.141	# <0.08	# <0.08
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		# 9.83	# 5.72	# 1.04			
Total Cyanide	<0.05 mg/l	TM227		# <0.05	# <0.05	# <0.05			
Sodium Dissolved	0.076 mg/l	TM228		17.8	9.59	7.36			
Magnesium Dissolved	0.036 mg/l	TM228		11.8	16.4	13.1	18	16.4	13.6
Potassium Dissolved	2.335 mg/l	TM228		<2.34	<2.34	<2.34			
Iron Dissolved	0.019 mg/l	TM228		<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
pH value	<1.00 pH	TM256		# 7.45	# 7.57	# 7.42	# 8.21	# 8.14	# 7.86

Validated

ALcontrol Laboratories Analytical Services

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

Results Legend
ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	PW2-09	PW4	PW9	SW1	SW2	SW3
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Sampled Date						
			Sample Received	21/09/2009	21/09/2009	21/09/2009	21/09/2009	21/09/2009	21/09/2009
			SDG Ref	090921-36	090921-36	090921-36	090921-36	090921-36	090921-36
			Sample Number(s)	493950	493969	494000	493880	493891	493902
E.coli (on liquids)	CFU/100ml	SUB		# 0	# 20	# 1			
Total Coliforms (W)	CFU/100ml	SUB		# 1	# 26	# 7			
Total Suspended Solids	<2 mg/l	TM022					# 4.5	# 4.5	# 71.5
Total Alkalinity as CaCO3	<2 mg/l	TM043		# 273	# 290	# 330	# 375	# 340	# 335
BOD	<1 mg/l O	TM045					# 1.16	# <1	# 1.31
Phenol	<0.002 mg/l	TM062		# <0.002	# <0.002	# <0.002			
Cresols	<0.006 mg/l	TM062		# <0.006	# <0.006	# <0.006			
Xylenols	<0.008 mg/l	TM062		# <0.008	# <0.008	# <0.008			
2.3.5 Trimethyl-Phenol	<0.003 mg/l	TM062		# <0.003	# <0.003	# <0.003			
2-Isopropyl Phenol	<0.006 mg/l	TM062		# <0.006	# <0.006	# <0.006			
Phenols Total of 5 Speciated	<0.025 mg/l	TM062		<0.025	<0.025	<0.025			
Total Organic Carbon	<3 mg/l	TM090		# <3	# <3	# <3			
Ammoniacal Nitrogen as N	<0.2 mg/l as	TM099		# <0.2	# <0.2	# <0.2	# 0.328	# <0.2	# <0.2
Fluoride	<0.5 mg/l	TM104		# <0.5	# <0.5	# <0.5			
COD	7 mg/l O	TM107					# 17.2	# 12.4	# 81.6
Conductivity (at 20 deg.C)	<0.014	TM120		# 0.658	# 0.6	# 0.653	# 1.09	# 0.875	# 0.644
Total Solids	<1 mg/l	TM139		444	386	416			
Cadmium Dissolved	<0.22 µg/l	TM152		# <0.22	# <0.22	# <0.22	# <0.22	# <0.22	# <0.22
Chromium Dissolved	<0.7 µg/l	TM152		# 5.63	# 5.79	# 6.76	# <0.7	# <0.7	# <0.7
Copper Dissolved	<1.6 µg/l	TM152		# 14	# 30.4	# 1.97	# 2.39	# <1.6	# <1.6
Lead Dissolved	<0.4 µg/l	TM152		# 0.794	# 0.671	# <0.4	# 0.597	# 0.471	# <0.4
Manganese Dissolved	<0.6 µg/l	TM152		# <0.6	# 1.94	# <0.6	# 10.6	# 19.8	# 116
Zinc Dissolved	<5 µg/l	TM152		# 22.7	# 55	# 9.42	# 8.98	# <5	# <5
Mercury Dissolved	<0.01 µg/l	TM183		# <0.01	# <0.01	# <0.01	# <0.01	# <0.01	# <0.01
Sulphate (soluble)	3 mg/l	TM184		# 36.9	# 11.9	# 10.9	# 16.1	# 18.6	# 13.1
Chloride	<2 mg/l	TM184		# 22.4	# 17.6	# 11.9	# 142	# 86.7	# 16.4
Phosphate (ortho as PO4)	<0.08 mg/l	TM184		# <0.08	# <0.08	# <0.08	# 0.141	# <0.08	# <0.08
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		# 9.83	# 5.72	# 1.04			
Total Cyanide	<0.05 mg/l	TM227		# <0.05	# <0.05	# <0.05			
Sodium Dissolved	0.076 mg/l	TM228		17.8	9.59	7.36			
Magnesium Dissolved	0.036 mg/l	TM228		11.8	16.4	13.1	18	16.4	13.6
Potassium Dissolved	2.335 mg/l	TM228		<2.34	<2.34	<2.34			
Iron Dissolved	0.019 mg/l	TM228		<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
pH value	<1.00 pH	TM256		# 7.45	# 7.57	# 7.42	# 8.21	# 8.14	# 7.86

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

SVOC MS (W) - Aqueous (W)

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	PW2-09	PW4	PW9			
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Sampled Date						
			Sample Received	21/09/2009	21/09/2009	21/09/2009			
			SDG Ref	090921-36	090921-36	090921-36			
			Sample Number(s)	493950	493969	494000			
1,2,4-Trichlorobenzene	<1 µg/l	TM176		<1	<1	<1			
1,2-Dichlorobenzene	<1 µg/l	TM176		<1	<1	<1			
1,3-Dichlorobenzene	<1 µg/l	TM176		<1	<1	<1			
1,4-Dichlorobenzene	<1 µg/l	TM176		<1	<1	<1			
2,4,5-Trichlorophenol	<1 µg/l	TM176		<1	<1	<1			
2,4,6-Trichlorophenol	<1 µg/l	TM176		<1	<1	<1			
2,4-Dichlorophenol	<1 µg/l	TM176		<1	<1	<1			
2,4-Dimethylphenol	<1 µg/l	TM176		<1	<1	<1			
2,4-Dinitrotoluene	<1 µg/l	TM176		<1	<1	<1			
2,6-Dinitrotoluene	<1 µg/l	TM176		<1	<1	<1			
2-Chloronaphthalene	<1 µg/l	TM176		<1	<1	<1			
2-Chlorophenol	<1 µg/l	TM176		<1	<1	<1			
2-Methylnaphthalene	<1 µg/l	TM176		<1	<1	<1			
2-Methylphenol	<1 µg/l	TM176		<1	<1	<1			
2-Nitroaniline	<1 µg/l	TM176		<1	<1	<1			
2-Nitrophenol	<1 µg/l	TM176		<1	<1	<1			
3-Nitroaniline	<1 µg/l	TM176		<1	<1	<1			
4-Bromophenylphenylether	<1 µg/l	TM176		<1	<1	<1			
4-Chloro-3-methylphenol	<1 µg/l	TM176		<1	<1	<1			
4-Chloroaniline	<1 µg/l	TM176		<1	<1	<1			
4-Chlorophenylphenylether	<1 µg/l	TM176		<1	<1	<1			
4-Methylphenol	<1 µg/l	TM176		<1	<1	<1			
4-Nitrophenol	<1 µg/l	TM176		<1	<1	<1			
4-Nitroaniline	<1 µg/l	TM176		<1	<1	<1			
Azobenzene	<1 µg/l	TM176		<1	<1	<1			
Acenaphthylene	<1 µg/l	TM176		<1	<1	<1			
Acenaphthene	<1 µg/l	TM176		<1	<1	<1			
Anthracene	<1 µg/l	TM176		<1	<1	<1			
Bis(2-chloroethyl)ether	<1 µg/l	TM176		<1	<1	<1			
Bis(2-chloroethoxy)methane	<1 µg/l	TM176		<1	<1	<1			
Bis(2-ethylhexyl) phthalate	<2 µg/l	TM176		<2	<2	<2			
Benzo(a)anthracene	<1 µg/l	TM176		<1	<1	<1			
Butylbenzyl phthalate	<1 µg/l	TM176		<1	<1	<1			
Benzo(b)fluoranthene	<1 µg/l	TM176		<1	<1	<1			
Benzo(k)fluoranthene	<1 µg/l	TM176		<1	<1	<1			
Benzo(a)pyrene	<1 µg/l	TM176		<1	<1	<1			
Benzo(ghi)perylene	<1 µg/l	TM176		<1	<1	<1			
Carbazole	<1 µg/l	TM176		<1	<1	<1			
Chrysene	<1 µg/l	TM176		<1	<1	<1			

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

SVOC MS (W) - Aqueous (W)

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

		Sample Identity	PW2-09	PW4	PW9			
		Depth (m)						
		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
		Sampled Date						
		Sample Received	21/09/2009	21/09/2009	21/09/2009			
		SDG Ref	090921-36	090921-36	090921-36			
		Sample Number(s)	493950	493969	494000			
Component	**LOD/Units**	**Method**						
Dibenzofuran	<1 µg/l	TM176	<1	<1	<1			
Di-n-butyl phthalate	<1 µg/l	TM176	<1	<1	<1			
Diethyl phthalate	<1 µg/l	TM176	<2	<2	<2			
Dibenzo(a,h)anthracene	<1 µg/l	TM176	<1	<1	<1			
Dimethyl phthalate	<1 µg/l	TM176	<1	<1	<1			
Di-n-Octyl phthalate	<5 µg/l	TM176	<5	<5	<5			
Fluoranthene	<1 µg/l	TM176	<1	<1	<1			
Fluorene	<1 µg/l	TM176	<1	<1	<1			
Hexachlorobenzene	<1 µg/l	TM176	<1	<1	<1			
Hexachlorobutadiene	<1 µg/l	TM176	<1	<1	<1			
Pentachlorophenol	<1 µg/l	TM176	<1	<1	<1			
Phenol	<1 µg/l	TM176	<1	<1	<1			
N-nitrosodi-n-propylamine	<1 µg/l	TM176	<1	<1	<1			
Hexachloroethane	<1 µg/l	TM176	<1	<1	<1			
Nitrobenzene	<1 µg/l	TM176	<1	<1	<1			
Naphthalene	<1 µg/l	TM176	<1	<1	<1			
Isophorone	<1 µg/l	TM176	<2	<2	<2			
Hexachlorocyclopentadiene	<1 µg/l	TM176	<2	<2	<2			
Phenanthrene	<1 µg/l	TM176	<1	<1	<1			
Indeno (1,2,3-cd) Pyrene	<1 µg/l	TM176	<1	<1	<1			
Pyrene	<1 µg/l	TM176	<1	<1	<1			

Validated

ALcontrol Laboratories Analytical Services

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

VOC MS (W) (W)

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity			PW2-09	PW4	PW9			
Depth (m)								
Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
Sampled Date								
Sample Received			21/09/2009	21/09/2009	21/09/2009			
SDG Ref			090921-36	090921-36	090921-36			
Sample Number(s)			493950	493969	494000			
Component	**LOD/Units**	**Method**						
Dichlorodifluoromethane	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
Chloromethane	<1.7 µg/l	TM208	# <1.7	# <1.7	# <1.7			
Vinyl Chloride	<1.2 µg/l	TM208	# <1.2	# <1.2	# <1.2			
Bromomethane	<2.0 µg/l	TM208	# <2	# <2	# <2			
Chloroethane	<2.5 µg/l	TM208	# <2.5	# <2.5	# <2.5			
Trichlorofluoromethane	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
1.1-Dichloroethene	<1.2 µg/l	TM208	# <1.2	# <1.2	# <1.2			
Carbon disulphide	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
Dichloromethane	<3.7 µg/l	TM208	# <3.7	# <3.7	# <3.7			
Methyl Tertiary Butyl Ether	<1.6 µg/l	TM208	# <1.6	# <1.6	# <1.6			
trans-1-2-Dichloroethene	<1.9 µg/l	TM208	# <1.9	# <1.9	# <1.9			
1.1-Dichloroethane	<1.2 µg/l	TM208	# <1.2	# <1.2	# <1.2			
cis-1-2-Dichloroethene	<2.3 µg/l	TM208	# <2.3	# <2.3	# <2.3			
2.2-Dichloropropane	<3.8 µg/l	TM208	# <3.8	# <3.8	# <3.8			
Bromochloromethane	<1.9 µg/l	TM208	# <1.9	# <1.9	# <1.9			
Chloroform	<1.8 µg/l	TM208	# <1.8	# <1.8	# <1.8			
1.1.1-Trichloroethane	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
1.1-Dichloropropene	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
Carbontetrachloride	<1.4 µg/l	TM208	# <1.4	# <1.4	# <1.4			
1.2-Dichloroethane	<3.3 µg/l	TM208	<3.3	<3.3	<3.3			
Benzene	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
Trichloroethene	<2.5 µg/l	TM208	# <2.5	# <2.5	# <2.5			
1.2-Dichloropropane	<3 µg/l	TM208	# <3	# <3	# <3			
Dibromomethane	<2.7 µg/l	TM208	# <2.7	# <2.7	# <2.7			
Bromodichloromethane	<0.9 µg/l	TM208	# <0.9	# <0.9	# <0.9			
cis-1-3-Dichloropropene	<1.9 µg/l	TM208	# <1.9	# <1.9	# <1.9			
Toluene	<1.4 µg/l	TM208	# <1.4	# <1.4	# <1.4			
trans-1-3-Dichloropropene	<3.5 µg/l	TM208	# <3.5	# <3.5	# <3.5			
1.1.2-Trichloroethane	<2.2 µg/l	TM208	# <2.2	# <2.2	# <2.2			
1.3-Dichloropropane	<2.2 µg/l	TM208	# <2.2	# <2.2	# <2.2			
Tetrachloroethene	<1.5 µg/l	TM208	# <1.5	# <1.5	# <1.5			
Dibromochloromethane	<1.7 µg/l	TM208	# <1.7	# <1.7	# <1.7			
1.2-Dibromoethane	<2.3 µg/l	TM208	# <2.3	# <2.3	# <2.3			
Chlorobenzene	<3.5 µg/l	TM208	# <3.5	# <3.5	# <3.5			
1.1.1.2-Tetrachloroethane	<1.3 µg/l	TM208	# <1.3	# <1.3	# <1.3			
Ethylbenzene	<2.5 µg/l	TM208	# <2.5	# <2.5	# <2.5			
p/m-Xylene	<2.5 µg/l	TM208	# <2.5	# <2.5	# <2.5			
o-Xylene	<1.7 µg/l	TM208	# <1.7	# <1.7	# <1.7			
Styrene	<1.2 µg/l	TM208	# <1.2	# <1.2	# <1.2			

Validated

ALcontrol Laboratories Analytical Services

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

VOC MS (W) (W)

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Sample Identity			PW2-09	PW4	PW9			
Depth (m)								
Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
Sampled Date								
Sample Received			21/09/2009	21/09/2009	21/09/2009			
SDG Ref			090921-36	090921-36	090921-36			
Sample Number(s)			493950	493969	494000			
Component	**LOD/Units**	**Method**						
Bromoform	<3 µg/l	TM208	# <3	# <3	# <3			
Isopropylbenzene	<1.4 µg/l	TM208	# <1.4	# <1.4	# <1.4			
1.1.2.2-Tetrachloroethane	<5.2 µg/l	TM208	<5.2	<5.2	<5.2			
1.2.3-Trichloropropane	<7.8 µg/l	TM208	# <7.8	# <7.8	# <7.8			
Bromobenzene	<2 µg/l	TM208	# <2	# <2	# <2			
Propylbenzene	<2.6 µg/l	TM208	# <2.6	# <2.6	# <2.6			
2-Chlorotoluene	<1.9 µg/l	TM208	# <1.9	# <1.9	# <1.9			
1.3.5-Trimethylbenzene	<1.8 µg/l	TM208	# <1.8	# <1.8	# <1.8			
4-Chlorotoluene	<1.9 µg/l	TM208	# <1.9	# <1.9	# <1.9			
tert-Butylbenzene	<2 µg/l	TM208	# <2	# <2	# <2			
1.2.4-Trimethylbenzene	<1.7 µg/l	TM208	# <1.7	# <1.7	# <1.7			
sec-Butylbenzene	<1.7 µg/l	TM208	# <1.7	# <1.7	# <1.7			
4-Isopropyltoluene	<2.6 µg/l	TM208	# <2.6	# <2.6	# <2.6			
1.3-Dichlorobenzene	<2.2 µg/l	TM208	# <2.2	# <2.2	# <2.2			
1.4-Dichlorobenzene	<2.7 µg/l	TM208	# <2.7	# <2.7	# <2.7			
n-Butylbenzene	<2 µg/l	TM208	# <2	# <2	# <2			
1.2-Dichlorobenzene	<3.7 µg/l	TM208	<3.7	<3.7	<3.7			
1.2-Dibromo-3-chloropropan	<9.8 µg/l	TM208	<9.8	<9.8	<9.8			
1.2.4-Trichlorobenzene	<2.3 µg/l	TM208	# <2.3	# <2.3	# <2.3			
Hexachlorobutadiene	<2.5 µg/l	TM208	# <2.5	# <2.5	# <2.5			
Naphthalene	<3.5 µg/l	TM208	# <3.5	# <3.5	# <3.5			
1.2.3-Trichlorobenzene	<3.1 µg/l	TM208	# <3.1	# <3.1	# <3.1			
1,3,5-Trichlorobenzene	<10 µg/l	TM208	<10	<10	<10			

Validated

ALcontrol Laboratories Analytical Services

SDG	090921-36	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-3	**Attention:**	Claire McLaughlin
Client Reference:		**Order No.:**	400246456
Location:	Silliot Hill Landfill 21/9/9	**Report No:**	62486

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	SW4	SW6	SW7			
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Sampled Date	21/09/2009					
			Sample Received	21/09/2009	21/09/2009	21/09/2009			
			SDG Ref	090921-36	090921-36	090921-36			
			Sample Number(s)	493916	493926	493935			
Total Suspended Solids	<2 mg/l	TM022		# 439	# 3.5	# <2			
Total Alkalinity as CaCO3	<2 mg/l	TM043		# 210	# 140	# 138			
BOD	<1 mg/l O	TM045		# 1450	# <1	# <1			
Ammoniacal Nitrogen as N	<0.2 mg/l as	TM099		# <0.2	# <0.2	# <0.2			
COD	7 mg/l O	TM107		# 4790	# 17.1	# 17.3			
Conductivity (at 20 deg.C)	<0.014	TM120		# 0.325	# 0.281	# 0.29			
Cadmium Dissolved	<0.22 µg/l	TM152		# <0.22	# <0.22	# <0.22			
Chromium Dissolved	<0.7 µg/l	TM152		# <0.7	# 1.74	# 2.08			
Copper Dissolved	<1.6 µg/l	TM152		# <1.6	# <1.6	# 1.68			
Lead Dissolved	<0.4 µg/l	TM152		# 1.28	# <0.4	# <0.4			
Manganese Dissolved	<0.6 µg/l	TM152		# 871	# 4.82	# 3.56			
Zinc Dissolved	<5 µg/l	TM152		# <5	# <5	# <5			
Mercury Dissolved	<0.01 µg/l	TM183		# <0.01	# <0.01	# <0.01			
Sulphate (soluble)	3 mg/l	TM184		# <3	# 8.1	# 8.1			
Chloride	<2 mg/l	TM184		# 15.4	# 9.8	# 11.5			
Phosphate (ortho as PO4)	<0.08 mg/l	TM184		# 1.54	# <0.08	# <0.08			
Magnesium Dissolved	0.036 mg/l	TM228		5.61	4.97	5.18			
Iron Dissolved	0.019 mg/l	TM228		6.19	<0.019	<0.019			
pH value	<1.00 pH	TM256		# 7.31	# 7.93	# 7.96			

APPENDIX

APPENDIX

1. *Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.*
2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*
3. *If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.*
4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*
5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*
6. *When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.*
7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.*
8. *If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.*
9. *NDP – No determination possible due to insufficient/unsuitable sample.*
10. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*
11. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*
12. ***Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.*
13. ***Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.*
14. *Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).*
15. *Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).*
16. *Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.*
17. *Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.*
18. *In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.*
19. *Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.*
20. *For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.*
21. *For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.*
22. *We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.*
23. *Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.*

Last updated 25 June 2009

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
EPH	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
EPH CWG	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
MINERAL OIL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
PCB 7 CONGENERS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
PCB TOTAL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GS MS*
SVOC	*DCM*	*LIQUID/LIQUID SHAKEN SVOC*	*GC MS*
FREE SULPHUR	*DCM*	*SOLID PHASE EXTRACTION*	*HPLC*
PEST OCP/OPP	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
TRIAZINE HERBS	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
PHENOLS MS	*DCM*	*SOLID PHASE EXTRACTION*	*GC MS*
TPH by INFRA RED (IR)	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
MINERAL OIL by IR	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
SAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
UNSAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
GLYCOLS	*DCM*	*LIQUID/LIQUID EXTRACTION*	*EZ FLASH*

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	*D&C*	*DCM*	*SOXTHERM*	*GRAVIMETRIC*
Cyclohexane Ext. Matter	*D&C*	*CYCLOHEXANE*	*SOXTHERM*	*GRAVIMETRIC*
Thin Layer Chromatography	*D&C*	*DCM*	*SOXTHERM*	*IATROSCAN*
Elemental Sulphur	*D&C*	*DCM*	*SOXTHERM*	*HPLC*
Phenols by GCMS	*WET*	*DCM*	*SOXTHERM*	*GC-MS*
Herbicides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
Pesticides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
EPH (DRO)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Min oil)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Cleaned up)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH CWG by GC	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
PCB tot / PCB con	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-MS*
Polyaromatic Hydrocarbons (MS)	*WET*	*HEXANE:ACETONE*	*Microwave TM218.*	*GC-MS*
C8-C40 (C6-C40)EZ Flash	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Polyaromatic Hydrocarbons Rapid GC	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Semi Volatile Organic Compounds	*WET*	*DCM:ACETONE*	*SONICATE*	*GC-MS*

Last updated 25 June 2009

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	***Common Name***
Chrysotile	*White Asbestos*
Amosite	*Brown Asbestos*
Crocidolite	*Blue Asbestos*
Fibrous Actinolite	*-*
Fibrous Anthophyllite	*-*
Fious Tremolite	

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Kildare County Council
Water Services
Aras Cilldara
Devoy Park
Naas
Co.Kildare

Attention: *Claire McLaughlin*

CERTIFICATE OF ANALYSIS

Date:	*29 September 2009*		
Job:	*D_KILCC_NAS-4*		
SDG Reference:	*090922-40*	***Report No.:***	*62528*
Your Reference:	*SILLIOTHILL, LANDFILL*		
Location:	*SILLIOTHILL, LANDFILL*		

A total of 6 samples was received on Tuesday September 22, 2009 and completed on Tuesday September 29, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation. We are pleased to enclose our report, it was a pleasure to be of service to you, and we look forward to our continuing association.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occuring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample. Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley
Operations Director - Land UK & I

UKAS TESTING
1291

GROUP

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council

Client Reference: SILLIOTHILL, LANDFILL **Order No.:** **Attention:** Claire McLaughlin **Report No:** 62528

Location: SILLIOTHILL, LANDFILL

Sample ID	Depth	Container	Sample Type	Alkalinity as CaCO3 All	Ammonium Anions by Kone (w) All	Conductivity (at 20 deg.C) All	Cyanide Complex/Free/Total/Thiocyan All	Dissolved Metals by ICP-MS All	Faecal Coliforms (W)* All	Fluoride (w) All	Mercury Dissolved Metals by iCap-OES Dissolved (W) All	pH Value All	SVOC MS (W) - Aqueous All	Total Coliforms(S)* All	Total Organic and Inorganic Carbon All	Total Solids All	VOC MS (W) All
							X										X
BH 11 D		60g VOC Dublin	LIQUID		X												
		Plastic NaOH (D)	LIQUID						X		X		X	X	X		
		H2SO4 (Dublin)	LIQUID	X		X	X	X		X		X				X	
		1l glass bottle (D)	LIQUID														X
		PLAS BOT (D)	LIQUID				X										
BH 13 - 07		60g VOC Dublin	LIQUID		X												
		Plastic NaOH (D)	LIQUID						X		X		X	X	X		
		H2SO4 (Dublin)	LIQUID	X		X	X	X		X		X				X	
		1l glass bottle (D)	LIQUID														X
		PLAS BOT (D)	LIQUID				X										
BH 3		60g VOC Dublin	LIQUID		X												
		Plastic NaOH (D)	LIQUID								X		X		X		
		H2SO4 (Dublin)	LIQUID	X		X	X	X		X		X				X	
		1l glass bottle (D)	LIQUID														X
		PLAS BOT (D)	LIQUID				X										
BH 4 - 07		60g VOC Dublin	LIQUID		X												
		Plastic NaOH (D)	LIQUID						X		X		X	X	X		
		H2SO4 (Dublin)	LIQUID	X		X	X	X		X		X				X	
		1l glass bottle (D)	LIQUID														X
		PLAS BOT (D)	LIQUID				X										
BH 9 D		60g VOC Dublin	LIQUID		X												
		Plastic NaOH (D)	LIQUID	X		X	X	X		X		X				X	
		H2SO4 (Dublin)	LIQUID						X		X		X	X	X		
		PLAS BOT (D)	LIQUID														X
		1l glass bottle (D)	LIQUID				X										
KTK 20		60g VOC Dublin	LIQUID		X												
		Plastic NaOH (D)	LIQUID						X		X		X	X	X		
		H2SO4 (Dublin)	LIQUID	X		X	X	X		X		X				X	
		1l glass bottle (D)	LIQUID														
		PLAS BOT (D)	LIQUID														

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Table of Results

Alkalinity as CaCO3

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Bicarbonate Alkalinity as CaCO3	<2	mg/l	TM043	190 #	195 #	180 #	1170 #
Carbonate Alkalinity as CaCO3	<2	mg/l	TM043	<2.00 #	<2.00 #	<2.00 #	290 #
Hydroxide Alkalinity as CaCO3	<2	mg/l	TM043	<2.00 #	<2.00 #	<2.00 #	<2.00 #
Total Alkalinity as CaCO3	<2	mg/l	TM043	190 #	195 #	180 #	1460 #

Alkalinity as CaCO3

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Bicarbonate Alkalinity as CaCO3	<2	mg/l	TM043	350 #	185 #
Carbonate Alkalinity as CaCO3	<2	mg/l	TM043	<2.00 #	10.0 #
Hydroxide Alkalinity as CaCO3	<2	mg/l	TM043	<2.00 #	<2.00 #
Total Alkalinity as CaCO3	<2	mg/l	TM043	350 #	195 #

Ammonium

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Ammoniacal Nitrogen as N	<0.2	mg/l as N	TM099	<0.200 #	<0.200 #	1.55 #	240 #

Ammonium

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Ammoniacal Nitrogen as N	<0.2	mg/l as N	TM099	0.540 #	<0.200 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Anions by Kone (w)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Chloride	<2	mg/l	TM184	14.1 #	18.3 #	19.2 #	339 #
Phosphate (ortho as PO4)	<0.08	mg/l	TM184	<0.0800 #	<0.0800 #	<0.0800 #	<0.0800 #
Sulphate (soluble)	3	mg/l	TM184	14.0 #	21.4 #	<3.00 #	<3.00 #
Total Oxidised Nitrogen as N	<0.1	mg/l	TM184	5.57 #	6.01 #	<0.100 #	0.111 #

Anions by Kone (w)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Chloride	<2	mg/l	TM184	169 #	13.5 #
Phosphate (ortho as PO4)	<0.08	mg/l	TM184	<0.0800 #	<0.0800 #
Sulphate (soluble)	3	mg/l	TM184	70.1 #	27.8 #
Total Oxidised Nitrogen as N	<0.1	mg/l	TM184	28.3 #	<0.100 #

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Conductivity (at 20 deg.C)	<0.014	mS/cm	TM120	0.601 #	0.628 #	0.640 #	3.62 #

Conductivity (at 20 deg.C)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Conductivity (at 20 deg.C)	<0.014	mS/cm	TM120	1.27 #	0.669 #

29/09/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Cyanide Complex/Free/Total/Thiocyan

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Total Cyanide	<0.05	mg/l	TM227	<0.0500 #	<0.0500 #	<0.0500 #	<0.0500 #

Cyanide Complex/Free/Total/Thiocyan

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Total Cyanide	<0.05	mg/l	TM227	<0.0500 #	<0.0500 #

Dissolved Metals by ICP-MS

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Cadmium Dissolved	<0.22	µg/l	TM152	<0.220 #	<0.220 #	<0.220 #	0.304 #
Chromium Dissolved	<0.7	µg/l	TM152	5.62 #	7.91 #	7.44 #	33.5 #
Copper Dissolved	<1.6	µg/l	TM152	<1.60 #	<1.60 #	<1.60 #	22.8 #
Lead Dissolved	<0.4	µg/l	TM152	<0.400 #	<0.400 #	<0.400 #	<0.400 #
Manganese Dissolved	<0.6	µg/l	TM152	0.781 #	0.688 #	782 #	161 #
Zinc Dissolved	<5	µg/l	TM152		8.39 #	<5.00 #	14.9 #

Dissolved Metals by ICP-MS

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Cadmium Dissolved	<0.22	µg/l	TM152	<0.220 #	<0.220 #
Chromium Dissolved	<0.7	µg/l	TM152	7.33 #	6.93 #
Copper Dissolved	<1.6	µg/l	TM152	2.13 #	<1.60 #
Lead Dissolved	<0.4	µg/l	TM152	<0.400 #	<0.400 #

29/09/2009

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 9 D	KTK 20
				Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496395	Water(GW/SW) 22/09/2009 090922-40 496457
Manganese Dissolved	<0.6	µg/l	TM152	148 #	701 #
Zinc Dissolved	<5	µg/l	TM152	<5.00 #	<5.00 #

Faecal Coliforms (W)*

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 4 - 07	BH 9 D
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 22/09/2009 090922-40 496435	Water(GW/SW) 22/09/2009 090922-40 496411	Water(GW/SW) 22/09/2009 22/09/2009 090922-40 498078	Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496395
	LoD	Units	Method				
Faecal coliforms*	<1	No/100ml	SUB	<1	<1	<1	84

Faecal Coliforms (W)*

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				KTK 20
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 22/09/2009 090922-40 496457
	LoD	Units	Method	
Faecal coliforms*	<1	No/100ml	SUB	<1

Fluoride (w)

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref				Water(GW/SW) 22/09/2009 090922-40 496435	Water(GW/SW) 22/09/2009 090922-40 496411	Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496367	Water(GW/SW) 22/09/2009 22/09/2009 090922-40 498078
	LoD	Units	Method				
Fluoride	<0.5	mg/l	TM104	2.20 #	<0.500 #	<0.500 #	<0.500 #
~~~~~~~~~~~~

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Fluoride (w)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Fluoride	<0.5	mg/l	TM104	2.50 #	<0.500 #

Mercury Dissolved

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Mercury Dissolved	<0.01	µg/l	TM183	<0.0100 #	<0.0100 #	<0.0100 #	<0.0100 #

Mercury Dissolved

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Mercury Dissolved	<0.01	µg/l	TM183	<0.0100 #	<0.0100 #

Metals by iCap-OES Dissolved (W)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Iron Dissolved	0.019	mg/l	TM228	<0.0190	<0.0190	<0.0190	<0.0190
Magnesium Dissolved	0.036	mg/l	TM228	12.6	13.7	12.6	21.4
Potassium Dissolved	2.335	mg/l	TM228	<2.34	<2.34	<2.34	108
Sodium Dissolved	0.076	mg/l	TM228	5.22	8.85	6.44	336

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Metals by iCap-OES Dissolved (W)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Iron Dissolved	0.019	mg/l	TM228	<0.0190	<0.0190
Magnesium Dissolved	0.036	mg/l	TM228	11.8	21.1
Potassium Dissolved	2.335	mg/l	TM228	9.44	<2.34
Sodium Dissolved	0.076	mg/l	TM228	90.2	12.1

pH Value

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
pH value	<1.00	pH Units	TM133	7.70 #	7.83 #	8.15 #	8.37 #

pH Value

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
pH value	<1.00	pH Units	TM133	7.57 #	7.82 #

SVOC MS (W) - Aqueous

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
1,2,4-Trichlorobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
1,2-Dichlorobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
1,3-Dichlorobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
1,4-Dichlorobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2,4,5-Trichlorophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2,4,6-Trichlorophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00

29/09/2009

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council

Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin

Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 11 D Water(GW/SW) 22/09/2009 090922-40 496435	BH 13 - 07 Water(GW/SW) 22/09/2009 090922-40 496411	BH 3 Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496367	BH 4 - 07 Water(GW/SW) 22/09/2009 22/09/2009 090922-40 498078
2,4-Dichlorophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2,4-Dimethylphenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2,4-Dinitrotoluene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2,6-Dinitrotoluene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2-Chloronaphthalene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2-Chlorophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2-Methylnaphthalene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2-Methylphenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2-Nitroaniline	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
2-Nitrophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
3-Nitroaniline	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Bromophenylphenylether	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Chloro-3-methylphenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Chloroaniline	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Chlorophenylphenylether	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Methylphenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Nitroaniline	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
4-Nitrophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Acenaphthene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Acenaphthylene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Anthracene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Azobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Benzo(a)anthracene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Benzo(a)pyrene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Benzo(b)fluoranthene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Benzo(ghi)perylene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Benzo(k)fluoranthene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Bis(2-chloroethoxy)methane	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Bis(2-chloroethyl)ether	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Bis(2-ethylhexyl) phthalate	<2	µg/l	TM176	<2.00	<2.00	<2.00	<2.00
Butylbenzyl phthalate	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Carbazole	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Chrysene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Dibenzo(a,h)anthracene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Dibenzofuran	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 11 D Water(GW/SW) 22/09/2009 090922-40 496435	BH 13 - 07 Water(GW/SW) 22/09/2009 090922-40 496411	BH 3 Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496367	BH 4 - 07 Water(GW/SW) 22/09/2009 22/09/2009 090922-40 498078
Diethyl phthalate	<1	µg/l	TM176	<5.00	<5.00	<5.00	<5.00
Dimethyl phthalate	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Di-n-butyl phthalate	<1	µg/l	TM176	<2.00	<2.00	<2.00	<2.00
Di-n-Octyl phthalate	<5	µg/l	TM176	<5.00	<5.00	<5.00	<5.00
Fluoranthene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Fluorene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Hexachlorobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Hexachlorobutadiene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Hexachlorocyclopentadiene	<1	µg/l	TM176	<2.00	<2.00	<2.00	<2.00
Hexachloroethane	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Indeno (1,2,3-cd) Pyrene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Isophorone	<1	µg/l	TM176	<5.00	<5.00	<5.00	<5.00
Naphthalene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Nitrobenzene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
N-nitrosodi-n-propylamine	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Pentachlorophenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Phenanthrene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Phenol	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00
Pyrene	<1	µg/l	TM176	<1.00	<1.00	<1.00	<1.00

SVOC MS (W) - Aqueous

Results Legend
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ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID Depth(m) Sample Type Sample received date Sampled date SDG Ref Sample Ref	LoD	Units	Method	BH 9 D Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496395	KTK 20 Water(GW/SW) 22/09/2009 090922-40 496457
1,2,4-Trichlorobenzene	<1	µg/l	TM176	<1.00	<1.00
1,2-Dichlorobenzene	<1	µg/l	TM176	<1.00	<1.00
1,3-Dichlorobenzene	<1	µg/l	TM176	<1.00	<1.00
1,4-Dichlorobenzene	<1	µg/l	TM176	<1.00	<1.00
2,4,5-Trichlorophenol	<1	µg/l	TM176	<1.00	<1.00
2,4,6-Trichlorophenol	<1	µg/l	TM176	<1.00	<1.00
2,4-Dichlorophenol	<1	µg/l	TM176	<1.00	<1.00
2,4-Dimethylphenol	<1	µg/l	TM176	<1.00	<1.00
2,4-Dinitrotoluene	<1	µg/l	TM176	<1.00	<1.00
2,6-Dinitrotoluene	<1	µg/l	TM176	<1.00	<1.00
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Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 9 D Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496395	KTK 20 Water(GW/SW) 22/09/2009 090922-40 496457
2-Chloronaphthalene	<1	µg/l	TM176	<1.00	<1.00
2-Chlorophenol	<1	µg/l	TM176	<1.00	<1.00
2-Methylnaphthalene	<1	µg/l	TM176	<1.00	<1.00
2-Methylphenol	<1	µg/l	TM176	<1.00	<1.00
2-Nitroaniline	<1	µg/l	TM176	<1.00	<1.00
2-Nitrophenol	<1	µg/l	TM176	<1.00	<1.00
3-Nitroaniline	<1	µg/l	TM176	<1.00	<1.00
4-Bromophenylphenylether	<1	µg/l	TM176	<1.00	<1.00
4-Chloro-3-methylphenol	<1	µg/l	TM176	<1.00	<1.00
4-Chloroaniline	<1	µg/l	TM176	<1.00	<1.00
4-Chlorophenylphenylether	<1	µg/l	TM176	<1.00	<1.00
4-Methylphenol	<1	µg/l	TM176	<1.00	<1.00
4-Nitroaniline	<1	µg/l	TM176	<1.00	<1.00
4-Nitrophenol	<1	µg/l	TM176	<1.00	<1.00
Acenaphthene	<1	µg/l	TM176	<1.00	<1.00
Acenaphthylene	<1	µg/l	TM176	<1.00	<1.00
Anthracene	<1	µg/l	TM176	<1.00	<1.00
Azobenzene	<1	µg/l	TM176	<1.00	<1.00
Benzo(a)anthracene	<1	µg/l	TM176	<1.00	<1.00
Benzo(a)pyrene	<1	µg/l	TM176	<1.00	<1.00
Benzo(b)fluoranthene	<1	µg/l	TM176	<1.00	<1.00
Benzo(ghi)perylene	<1	µg/l	TM176	<1.00	<1.00
Benzo(k)fluoranthene	<1	µg/l	TM176	<1.00	<1.00
Bis(2-chloroethoxy)methane	<1	µg/l	TM176	<1.00	<1.00
Bis(2-chloroethyl)ether	<1	µg/l	TM176	<1.00	<1.00
Bis(2-ethylhexyl) phthalate	<2	µg/l	TM176	<2.00	<2.00
Butylbenzyl phthalate	<1	µg/l	TM176	<1.00	<1.00
Carbazole	<1	µg/l	TM176	<1.00	<1.00
Chrysene	<1	µg/l	TM176	<1.00	<1.00
Dibenzo(a,h)anthracene	<1	µg/l	TM176	<1.00	<1.00
Dibenzofuran	<1	µg/l	TM176	<1.00	<1.00
Diethyl phthalate	<1	µg/l	TM176	<5.00	<5.00
Dimethyl phthalate	<1	µg/l	TM176	<1.00	<1.00
Di-n-butyl phthalate	<1	µg/l	TM176	<2.00	<2.00
Di-n-Octyl phthalate	<5	µg/l	TM176	<5.00	<5.00

29/09/2009

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 9 D	KTK 20
				Water(GW/SW)	Water(GW/SW)
				22/09/2009	22/09/2009
				22/09/2009	
				090922-40	090922-40
				496395	496457
Fluoranthene	<1	µg/l	TM176	<1.00	<1.00
Fluorene	<1	µg/l	TM176	<1.00	<1.00
Hexachlorobenzene	<1	µg/l	TM176	<1.00	<1.00
Hexachlorobutadiene	<1	µg/l	TM176	<1.00	<1.00
Hexachlorocyclopentadiene	<1	µg/l	TM176	<2.00	<2.00
Hexachloroethane	<1	µg/l	TM176	<1.00	<1.00
Indeno (1,2,3-cd) Pyrene	<1	µg/l	TM176	<1.00	<1.00
Isophorone	<1	µg/l	TM176	<5.00	<5.00
Naphthalene	<1	µg/l	TM176	<1.00	<1.00
Nitrobenzene	<1	µg/l	TM176	<1.00	<1.00
N-nitrosodi-n-propylamine	<1	µg/l	TM176	<1.00	<1.00
Pentachlorophenol	<1	µg/l	TM176	<1.00	<1.00
Phenanthrene	<1	µg/l	TM176	<1.00	<1.00
Phenol	<1	µg/l	TM176	<1.00	<1.00
Pyrene	<1	µg/l	TM176	<1.00	<1.00

Total Coliforms(S)*

Results Legend
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ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 4 - 07	BH 9 D
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	498078	496395
	LoD	Units	Method				
Total coliform*	<1	No/100ml	SUB	1300	<1	38	84

Total Coliforms(S)*

Results Legend
~~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				KTK 20
Depth(m)				
Sample Type				Water(GW/SW)
Sample received date				22/09/2009
Sampled date				
SDG Ref				090922-40
Sample Ref				496457
	LoD	Units	Method	
Total coliform*	<1	No/100ml	SUB	9400

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Total Organic and Inorganic Carbon

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Total Organic Carbon	<3	mg/l	TM090	3.45 #	<3.00 #	3.55 #	62.1 #

Total Organic and Inorganic Carbon

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Total Organic Carbon	<3	mg/l	TM090	6.42 #	3.23 #

Total Solids

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
Total Solids	<1	mg/l	TM139	527	516	490	1580

Total Solids

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 % The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
Total Solids	<1	mg/l	TM139	2060	497

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council

Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin

Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

VOC MS (W)

Results Legend
~~~~~~~~~~~
ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 11 D	BH 13 - 07	BH 3	BH 4 - 07
Depth(m)							
Sample Type				Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009	22/09/2009	22/09/2009
Sampled date						22/09/2009	22/09/2009
SDG Ref				090922-40	090922-40	090922-40	090922-40
Sample Ref				496435	496411	496367	498078
	LoD	Units	Method				
1,3,5-Trichlorobenzene	<10	µg/l	TM208	<10	<10	<10	<10
1.1.1.2-Tetrachloroethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #	<1.30 #	<1.30 #
1.1.1-Trichloroethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #	<1.30 #	<1.30 #
1.1.2.2-Tetrachloroethane	<5.2	µg/l	TM208	<5.20	<5.20	<5.20	<5.20
1.1.2-Trichloroethane	<2.2	µg/l	TM208	<2.20 #	<2.20 #	<2.20 #	<2.20 #
1.1-Dichloroethane	<1.2	µg/l	TM208	<1.20 #	<1.20 #	<1.20 #	<1.20 #
1.1-Dichloroethene	<1.2	µg/l	TM208	<1.20 #	<1.20 #	<1.20 #	<1.20 #
1.1-Dichloropropene	<1.3	µg/l	TM208	<1.30 #	<1.30 #	<1.30 #	<1.30 #
1.2.3-Trichlorobenzene	<3.1	µg/l	TM208	<3.10 #	<3.10 #	<3.10 #	<3.10 #
1.2.3-Trichloropropane	<7.8	µg/l	TM208	<7.80 #	<7.80 #	<7.80 #	<7.80 #
1.2.4-Trichlorobenzene	<2.3	µg/l	TM208	<2.30 #	<2.30 #	<2.30 #	<2.30 #
1.2.4-Trimethylbenzene	<1.7	µg/l	TM208	<1.70 #	<1.70 #	<1.70 #	<1.70 #
1.2-Dibromo-3-chloropropane	<9.8	µg/l	TM208	<9.80	<9.80	<9.80	<9.80
1.2-Dibromoethane	<2.3	µg/l	TM208	<2.30 #	<2.30 #	<2.30 #	<2.30 #
1.2-Dichlorobenzene	<3.7	µg/l	TM208	<3.70	<3.70	<3.70	<3.70
1.2-Dichloroethane	<3.3	µg/l	TM208	<3.30	<3.30	<3.30	<3.30
1.2-Dichloropropane	<3	µg/l	TM208	<3.00 #	<3.00 #	<3.00 #	<3.00 #
1.3.5-Trimethylbenzene	<1.8	µg/l	TM208	<1.80 #	<1.80 #	<1.80 #	<1.80 #
1.3-Dichlorobenzene	<2.2	µg/l	TM208	<2.20 #	<2.20 #	<2.20 #	<2.20 #
1.3-Dichloropropane	<2.2	µg/l	TM208	<2.20 #	<2.20 #	<2.20 #	<2.20 #
1.4-Dichlorobenzene	<2.7	µg/l	TM208	<2.70 #	<2.70 #	<2.70 #	<2.70 #
2.2-Dichloropropane	<3.8	µg/l	TM208	<3.80 #	<3.80 #	<3.80 #	<3.80 #
2-Chlorotoluene	<1.9	µg/l	TM208	<1.90 #	<1.90 #	<1.90 #	<1.90 #
4-Chlorotoluene	<1.9	µg/l	TM208	<1.90 #	<1.90 #	<1.90 #	<1.90 #
4-Isopropyltoluene	<2.6	µg/l	TM208	<2.60 #	<2.60 #	<2.60 #	<2.60 #
Benzene	<1.3	µg/l	TM208	<1.30 #	<1.30 #	<1.30 #	1.91 #
Bromobenzene	<2	µg/l	TM208	<2.00 #	<2.00 #	<2.00 #	<2.00 #
Bromochloromethane	<1.9	µg/l	TM208	<1.90 #	<1.90 #	<1.90 #	<1.90 #
Bromodichloromethane	<0.9	µg/l	TM208	<0.900 #	<0.900 #	<0.900 #	<0.900 #
Bromoform	<3	µg/l	TM208	<3.00 #	<3.00 #	<3.00 #	<3.00 #
Bromomethane	<2.0	µg/l	TM208	<2.00 #	<2.00 #	<2.00 #	<2.00 #
Carbon disulphide	<1.3	µg/l	TM208	<1.30 #	<1.30 #	<1.30 #	<1.30 #
Carbontetrachloride	<1.4	µg/l	TM208	<1.40 #	<1.40 #	<1.40 #	<1.40 #
Chlorobenzene	<3.5	µg/l	TM208	<3.50 #	<3.50 #	<3.50 #	<3.50 #

29/09/2009
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Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council

Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin

Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 11 D Water(GW/SW) 22/09/2009 090922-40 496435	BH 13 - 07 Water(GW/SW) 22/09/2009 090922-40 496411	BH 3 Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496367	BH 4 - 07 Water(GW/SW) 22/09/2009 22/09/2009 090922-40 498078
Chloroethane	<2.5	µg/l	TM208	<2.50 #	<2.50 #	<2.50 #	<2.50 #
Chloroform	<1.8	µg/l	TM208	<1.80 #	<1.80 #	<1.80 #	<1.80 #
Chloromethane	<1.7	µg/l	TM208	<1.70 #	<1.70 #	<1.70 #	<1.70 #
cis-1-2-Dichloroethene	<2.3	µg/l	TM208	<2.30 #	<2.30 #	<2.30 #	<2.30 #
cis-1-3-Dichloropropene	<1.9	µg/l	TM208	<1.90 #	<1.90 #	<1.90 #	<1.90 #
Dibromochloromethane	<1.7	µg/l	TM208	<1.70 #	<1.70 #		<1.70 #
Dibromomethane	<2.7	µg/l	TM208	<2.70 #	<2.70 #	<2.70 #	<2.70 #
Dichlorodifluoromethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #		<1.30 #
Dichloromethane	<3.7	µg/l	TM208	<3.70 #	<3.70 #	<3.70 #	<3.70 #
Ethylbenzene	<2.5	µg/l	TM208	<2.50 #	<2.50 #	<2.50 #	<2.50 #
Hexachlorobutadiene	<2.5	µg/l	TM208	<2.50 #	<2.50 #	<2.50 #	<2.50 #
Isopropylbenzene	<1.4	µg/l	TM208	<1.40 #	<1.40 #	<1.40 #	<1.40 #
Methyl Tertiary Butyl Ether	<1.6	µg/l	TM208	<1.60 #	<1.60 #	<1.60 #	<1.60 #
Naphthalene	<3.5	µg/l	TM208	<3.50 #	<3.50 #	<3.50 #	<3.50 #
n-Butylbenzene	<2	µg/l	TM208	<2.00 #	<2.00 #	<2.00 #	<2.00 #
o-Xylene	<1.7	µg/l	TM208	<1.70 #	<1.70 #	<1.70 #	<1.70 #
p/m-Xylene	<2.5	µg/l	TM208	<2.50 #	<2.50 #	<2.50 #	<2.50 #
Propylbenzene	<2.6	µg/l	TM208	<2.60 #	<2.60 #	<2.60 #	<2.60 #
sec-Butylbenzene	<1.7	µg/l	TM208	<1.70 #	<1.70 #	<1.70 #	<1.70 #
Styrene	<1.2	µg/l	TM208	<1.20 #	<1.20 #	<1.20 #	<1.20 #
tert-Butylbenzene	<2	µg/l	TM208	<2.00 #	<2.00 #	<2.00 #	<2.00 #
Tetrachloroethene	<1.5	µg/l	TM208	<1.50 #	<1.50 #	<1.50 #	<1.50 #
Toluene	<1.4	µg/l	TM208	<1.40 #	<1.40 #	<1.40 #	<1.40 #
trans-1-2-Dichloroethene	<1.9	µg/l	TM208	<1.90 #	<1.90 #	<1.90 #	<1.90 #
trans-1-3-Dichloropropene	<3.5	µg/l	TM208	<3.50 #	<3.50 #	<3.50 #	<3.50 #
Trichloroethene	<2.5	µg/l	TM208	<2.50 #	<2.50 #	<2.50 #	<2.50 #
Trichlorofluoromethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #	<1.30 #	<1.30 #
Vinyl Chloride	<1.2	µg/l	TM208	<1.20 #	<1.20 #	<1.20 #	<1.20 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council

Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin

Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

VOC MS (W)

Results Legend
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ISO17025 Accredited.
m MCERTS accredited.
* sub contracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Sample ID				BH 9 D	KTK 20
Depth(m)					
Sample Type				Water(GW/SW)	Water(GW/SW)
Sample received date				22/09/2009	22/09/2009
Sampled date				22/09/2009	
SDG Ref				090922-40	090922-40
Sample Ref				496395	496457
	LoD	Units	Method		
1,3,5-Trichlorobenzene	<10	µg/l	TM208	<10	<10
1.1.1.2-Tetrachloroethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #
1.1.1-Trichloroethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #
1.1.2.2-Tetrachloroethane	<5.2	µg/l	TM208	<5.20	<5.20
1.1.2-Trichloroethane	<2.2	µg/l	TM208	<2.20 #	<2.20 #
1.1-Dichloroethane	<1.2	µg/l	TM208	<1.20 #	<1.20 #
1.1-Dichloroethene	<1.2	µg/l	TM208	<1.20 #	<1.20 #
1.1-Dichloropropene	<1.3	µg/l	TM208	<1.30 #	<1.30 #
1.2.3-Trichlorobenzene	<3.1	µg/l	TM208	<3.10 #	<3.10 #
1.2.3-Trichloropropane	<7.8	µg/l	TM208	<7.80 #	<7.80 #
1.2.4-Trichlorobenzene	<2.3	µg/l	TM208	<2.30 #	<2.30 #
1.2.4-Trimethylbenzene	<1.7	µg/l	TM208	<1.70 #	<1.70 #
1.2-Dibromo-3-chloropropane	<9.8	µg/l	TM208	<9.80	<9.80
1.2-Dibromoethane	<2.3	µg/l	TM208	<2.30 #	<2.30 #
1.2-Dichlorobenzene	<3.7	µg/l	TM208	<3.70	<3.70
1.2-Dichloroethane	<3.3	µg/l	TM208	<3.30	<3.30
1.2-Dichloropropane	<3	µg/l	TM208	<3.00 #	<3.00 #
1.3.5-Trimethylbenzene	<1.8	µg/l	TM208	<1.80 #	<1.80 #
1.3-Dichlorobenzene	<2.2	µg/l	TM208	<2.20 #	<2.20 #
1.3-Dichloropropane	<2.2	µg/l	TM208	<2.20 #	<2.20 #
1.4-Dichlorobenzene	<2.7	µg/l	TM208	<2.70 #	<2.70 #
2.2-Dichloropropane	<3.8	µg/l	TM208	<3.80 #	<3.80 #
2-Chlorotoluene	<1.9	µg/l	TM208	<1.90 #	<1.90 #
4-Chlorotoluene	<1.9	µg/l	TM208	<1.90 #	<1.90 #
4-Isopropyltoluene	<2.6	µg/l	TM208	<2.60 #	<2.60 #
Benzene	<1.3	µg/l	TM208	<1.30 #	<1.30 #
Bromobenzene	<2	µg/l	TM208	<2.00 #	<2.00 #
Bromochloromethane	<1.9	µg/l	TM208	<1.90 #	<1.90 #
Bromodichloromethane	<0.9	µg/l	TM208	<0.900 #	<0.900 #
Bromoform	<3	µg/l	TM208	<3.00 #	<3.00 #
Bromomethane	<2.0	µg/l	TM208	<2.00 #	<2.00 #
Carbon disulphide	<1.3	µg/l	TM208	<1.30 #	<1.30 #
Carbontetrachloride	<1.4	µg/l	TM208	<1.40 #	<1.40 #
Chlorobenzene	<3.5	µg/l	TM208	<3.50 #	<3.50 #

29/09/2009
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Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council

Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin

Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

				BH 9 D Water(GW/SW) 22/09/2009 22/09/2009 090922-40 496395	KTK 20 Water(GW/SW) 22/09/2009 090922-40 496457
Chloroethane	<2.5	µg/l	TM208	<2.50 #	<2.50 #
Chloroform	<1.8	µg/l	TM208	<1.80 #	<1.80 #
Chloromethane	<1.7	µg/l	TM208	<1.70 #	<1.70 #
cis-1-2-Dichloroethene	<2.3	µg/l	TM208	<2.30 #	<2.30 #
cis-1-3-Dichloropropene	<1.9	µg/l	TM208	<1.90 #	<1.90 #
Dibromochloromethane	<1.7	µg/l	TM208	<1.70 #	<1.70 #
Dibromomethane	<2.7	µg/l	TM208	<2.70 #	<2.70 #
Dichlorodifluoromethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #
Dichloromethane	<3.7	µg/l	TM208	<3.70 #	<3.70 #
Ethylbenzene	<2.5	µg/l	TM208	<2.50 #	<2.50 #
Hexachlorobutadiene	<2.5	µg/l	TM208	<2.50 #	<2.50 #
Isopropylbenzene	<1.4	µg/l	TM208	<1.40 #	<1.40 #
Methyl Tertiary Butyl Ether	<1.6	µg/l	TM208	<1.60 #	<1.60 #
Naphthalene	<3.5	µg/l	TM208	<3.50 #	<3.50 #
n-Butylbenzene	<2	µg/l	TM208	<2.00 #	<2.00 #
o-Xylene	<1.7	µg/l	TM208	<1.70 #	<1.70 #
p/m-Xylene	<2.5	µg/l	TM208	<2.50 #	<2.50 #
Propylbenzene	<2.6	µg/l	TM208	<2.60 #	<2.60 #
sec-Butylbenzene	<1.7	µg/l	TM208	<1.70 #	<1.70 #
Styrene	<1.2	µg/l	TM208	<1.20 #	<1.20 #
tert-Butylbenzene	<2	µg/l	TM208	<2.00 #	<2.00 #
Tetrachloroethene	<1.5	µg/l	TM208	<1.50 #	<1.50 #
Toluene	<1.4	µg/l	TM208	<1.40 #	<1.40 #
trans-1-2-Dichloroethene	<1.9	µg/l	TM208	<1.90 #	<1.90 #
trans-1-3-Dichloropropene	<3.5	µg/l	TM208	<3.50 #	<3.50 #
Trichloroethene	<2.5	µg/l	TM208	<2.50 #	<2.50 #
Trichlorofluoromethane	<1.3	µg/l	TM208	<1.30 #	<1.30 #
Vinyl Chloride	<1.2	µg/l	TM208	<1.20 #	<1.20 #

Validated

ALcontrol Laboratories Analytical Services

Job: D_KILCC_NAS-4 **Customer:** Kildare County Council
Client Reference: SILLIOTHILL, LANDFILL **Attention:** Claire McLaughlin
Location: SILLIOTHILL, LANDFILL **Order No.:** **Report No:** 62528

Test Completion dates

SDG reference: 090922-40

Sample ID	Depth	Type	Alkalinity as CaCO3	Ammonium	Anions by Kone (w)	Conductivity (at 20 deg.C)	Cyanide	Dissolved Metals by ICP-MS	Faecal Coliforms (W)*	Fluoride (w)	Mercury Dissolved	Metals by iCap-OES Dissolved (W)	pH Value	SVOC MS (W) - Aqueous	Total Coliforms(S)*	Total Organic and Inorganic Carbon	Total Solids	VOC MS (W)
BH 11 D		LIQUID	28/09/2009	25/09/2009	25/09/2009	24/09/2009	24/09/2009	23/09/2009	29/09/2009	24/09/2009	24/09/2009	23/09/2009	24/09/2009	29/09/2009	29/09/2009	24/09/2009	25/09/2009	29/09/2009
BH 13 - 07		LIQUID	28/09/2009	25/09/2009	25/09/2009	24/09/2009	24/09/2009	23/09/2009	29/09/2009	24/09/2009	24/09/2009	23/09/2009	24/09/2009	29/09/2009	29/09/2009	24/09/2009	25/09/2009	29/09/2009
BH 3		LIQUID	28/09/2009	25/09/2009	25/09/2009	24/09/2009	24/09/2009	24/09/2009		24/09/2009	24/09/2009	23/09/2009	24/09/2009	29/09/2009		23/09/2009	25/09/2009	29/09/2009
BH 4 - 07		LIQUID	28/09/2009	25/09/2009	25/09/2009	24/09/2009	24/09/2009	24/09/2009	29/09/2009	24/09/2009	24/09/2009	23/09/2009	24/09/2009	29/09/2009	29/09/2009	23/09/2009	25/09/2009	29/09/2009
BH 9 D		LIQUID	28/09/2009	25/09/2009	25/09/2009	24/09/2009	24/09/2009	23/09/2009	29/09/2009	24/09/2009	24/09/2009	23/09/2009	24/09/2009	29/09/2009	29/09/2009	24/09/2009	25/09/2009	29/09/2009
KTK 20		LIQUID	28/09/2009	25/09/2009	25/09/2009	24/09/2009	24/09/2009	23/09/2009	29/09/2009	24/09/2009	24/09/2009	23/09/2009	24/09/2009	29/09/2009	29/09/2009	24/09/2009	25/09/2009	29/09/2009

APPENDIX

APPENDIX

1. *Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.*
2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*
3. *If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.*
4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*
5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*
6. *When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.*
7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.*
8. *If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.*
9. *NDP – No determination possible due to insufficient/unsuitable sample.*
10. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*
11. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*
12. ***Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.*
13. ***Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.*
14. *Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).*
15. *Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).*
16. *Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.*
17. *Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.*
18. *In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.*
19. *Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.*
20. *For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.*
21. *For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.*
22. *We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.*
23. *Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.*

Last updated 25 June 2009

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
EPH	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
EPH CWG	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
MINERAL OIL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
PCB 7 CONGENERS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
PCB TOTAL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GS MS*
SVOC	*DCM*	*LIQUID/LIQUID SHAKEN SVOC*	*GC MS*
FREE SULPHUR	*DCM*	*SOLID PHASE EXTRACTION*	*HPLC*
PEST OCP/OPP	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
TRIAZINE HERBS	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
PHENOLS MS	*DCM*	*SOLID PHASE EXTRACTION*	*GC MS*
TPH by INFRA RED (IR)	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
MINERAL OIL by IR	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
SAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
UNSAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
GLYCOLS	*DCM*	*LIQUID/LIQUID EXTRACTION*	*EZ FLASH*

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	*D&C*	*DCM*	*SOXTHERM*	*GRAVIMETRIC*
Cyclohexane Ext. Matter	*D&C*	*CYCLOHEXANE*	*SOXTHERM*	*GRAVIMETRIC*
Thin Layer Chromatography	*D&C*	*DCM*	*SOXTHERM*	*IATROSCAN*
Elemental Sulphur	*D&C*	*DCM*	*SOXTHERM*	*HPLC*
Phenols by GCMS	*WET*	*DCM*	*SOXTHERM*	*GC-MS*
Herbicides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
Pesticides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
EPH (DRO)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Min oil)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Cleaned up)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH CWG by GC	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
PCB tot / PCB con	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-MS*
Polyaromatic Hydrocarbons (MS)	*WET*	*HEXANE:ACETONE*	*Microwave TM218.*	*GC-MS*
C8-C40 (C6-C40)EZ Flash	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Polyaromatic Hydrocarbons Rapid GC	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Semi Volatile Organic Compounds	*WET*	*DCM:ACETONE*	*SONICATE*	*GC-MS*

Last updated 25 June 2009

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	–

ALcontrol Laboratories

Unit 18A
Rosemount Business Park
Ballycoolin
Dublin 11
Tel : (0035) 3188 29893

Kildare County Council
Water Services
Aras Cilldara
Devoy Park
Naas
Co.Kildare

Attention: *Claire McLaughlin*

CERTIFICATE OF ANALYSIS

Date:	*23 October 2009*		
Job:	*D_KILCC_NAS-5*		
Sample Delivery Group (SDG):	*091012-9*	***Report No.:***	*63723*
Your Reference:	*SILLIOT HILL*		
Location:	*SILLIOT HILL*		

A total of 16 samples was received on Friday October 09, 2009 and completed on Friday October 23, 2009. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories. Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Chris Crutchley
Operations Director - Land UK & I

UKAS TESTING
1291

GROUP

ALcontrol Laboratories Analytical Services

SDG:	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Results Legend

X Test

N No Determination Possible

		Sample ID	ACA D1	ACA D2	ACA D3	ACA D4	BT-1	BT-2	BT-3	BT-4	HOLDING TANK	INLET	SH D1	SH D2	SH D3	SH D4	SH D6	SH D7	STONE FILTER	Total
		Depth																		
		Container	JAR (D)	JAR (D)	JAR (D)	JAR (D)	60g VOC Dublin	60g VOC Dublin	60g VOC Dublin	60g VOC Dublin	60g VOC Dublin	60g VOC Dublin	JAR (D)	JAR (D)	JAR (D)	JAR (D)	JAR (D)	JAR (D)	60g VOC Dublin	
		Sample Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	
Determination of Dissolved Gases	All																			
Dust in Water	All						X	X	N	X	X	X							X	16
			X	X	X	X							X	X	X	X	X	X		10

SDG:	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Test Completion dates

SDG reference: 091012-9

Sample ID	Depth	Type	Determination of Dissolved Gases	Dust in Water
ACA D1		LIQUID		15/10/2009
ACA D2		LIQUID		15/10/2009
ACA D3		LIQUID		15/10/2009
ACA D4		LIQUID		15/10/2009
BT-1		LIQUID	16/10/2009	
BT-2		LIQUID	16/10/2009	
BT-4		LIQUID	16/10/2009	
HOLDING TANK		LIQUID	16/10/2009	
INLET		LIQUID	16/10/2009	
SH D1		LIQUID		15/10/2009
SH D2		LIQUID		15/10/2009
SH D3		LIQUID		15/10/2009
SH D4		LIQUID		15/10/2009
SH D6		LIQUID		15/10/2009
SH D7		LIQUID		15/10/2009

ALcontrol Laboratories Analytical Services

SDG:	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Test Completion dates

SDG reference: 091012-9

Sample ID	Depth	Type	Determination of Dissolved Gases	Dust in Water
ACA D1		LIQUID		15/10/2009
ACA D2		LIQUID		15/10/2009
ACA D3		LIQUID		15/10/2009
ACA D4		LIQUID		15/10/2009
BT-1		LIQUID	16/10/2009	
BT-2		LIQUID	16/10/2009	
BT-4		LIQUID	16/10/2009	
HOLDING TANK		LIQUID	16/10/2009	
INLET		LIQUID	16/10/2009	
SH D1		LIQUID		15/10/2009
SH D2		LIQUID		15/10/2009
SH D3		LIQUID		15/10/2009
SH D4		LIQUID		15/10/2009
SH D6		LIQUID		15/10/2009
SH D7		LIQUID		15/10/2009

SDG:	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Test Completion dates

SDG reference: 091012-9

Sample ID	Depth	Type	Determination of Dissolved Gases	Dust in Water
ACA D1		LIQUID		15/10/2009
ACA D2		LIQUID		15/10/2009
ACA D3		LIQUID		15/10/2009
ACA D4		LIQUID		15/10/2009
BT-1		LIQUID	16/10/2009	
BT-2		LIQUID	16/10/2009	
BT-4		LIQUID	16/10/2009	
HOLDING TANK		LIQUID	16/10/2009	
INLET		LIQUID	16/10/2009	
SH D1		LIQUID		15/10/2009
SH D2		LIQUID		15/10/2009
SH D3		LIQUID		15/10/2009
SH D4		LIQUID		15/10/2009
SH D6		LIQUID		15/10/2009
SH D7		LIQUID		15/10/2009

SDG:	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

				Determination of Dissolved Gases	Dust in Water
STONE FILTER		LIQUID	16/10/2009		

Validated

ALcontrol Laboratories Analytical Services

SDG	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Results Legend

\# ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	ACA D1	ACA D2	ACA D3	ACA D4	BT-1	BT-2
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Sampled Date	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009
			Sample Received	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009
			SDG Ref	091012-9	091012-9	091012-9	091012-9	091012-9	091012-9
			Sample Number(s)	536649	536652	536722	536656	536695	536697
Methane Dissolved	<1 µg/l	TM223						221	36.2
Dust	<0.026	TM253		60	226	56.7	96.7		
Organic Dust	mg/m2/day	TM253		42.5	217	56.7	72.5		
Inorganic dust	mg/m2/day	TM253		17.5	9.17	0	24.2		

Validated

ALcontrol Laboratories Analytical Services

SDG	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %
The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	BT-4	HOLDING - TANK	INLET	SH D1	SH D2	SH D3
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Sampled Date	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009
			Sample Received	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009	09/10/2009
			SDG Ref	091012-9	091012-9	091012-9	091012-9	091012-9	091012-9
			Sample Number(s)	536702	536708	536690	536659	536661	536665
Methane Dissolved	<1 µg/l	TM223		1.84	7.59	2690			
Dust	<0.026	TM253					65.8	21.7	320
Organic Dust	mg/m2/day	TM253					30.8	0	237
Inorganic dust	mg/m2/day	TM253					35	21.7	83.3

Validated

ALcontrol Laboratories Analytical Services

SDG	091012-9	**Customer:**	Kildare County Council
Job:	D_KILCC_NAS-5	**Attention:**	Claire McLaughlin
Client Reference:	SILLIOT HILL	**Order No.:**	
Location:	SILLIOT HILL	**Report No:**	63723

Results Legend

\# ISO17025 accredited.
M mCERTS accredited.
* subcontracted test.
** This result relates to the % recovery of the surrogate standard added to the sample to check on the efficiency of the method. Acceptable limits for most organic methods are 70 - 130 %. The results of the individual compounds within the sample are not corrected for this recovery.

Component	LOD/Units	Method	Sample Identity	SH D4	SH D6	SH D7	STONE FILTER		
			Depth (m)						
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Sampled Date	09/10/2009	09/10/2009	09/10/2009	09/10/2009		
			Sample Received	09/10/2009	09/10/2009	09/10/2009	09/10/2009		
			SDG Ref	091012-9	091012-9	091012-9	091012-9		
			Sample Number(s)	536667	536669	536673	536705		
Methane Dissolved	<1 µg/l	TM223					16		
Dust	<0.026	TM253		18.3	21.7	24.2			
Organic Dust	mg/m2/day	TM253		23.3	20.8	21.7			
Inorganic dust	mg/m2/day	TM253		-5	0.833	2.5			

Notification of NDP's (No determination possible)

SDG Number	091012-9	**Location**	SILLIOT HILL
Client	D_KILCC_NAS	**Order No.**	
Client Reference	SILLIOT HILL	**Report No.**	25162-0
Attention	*Claire McLaughlin*	**Date Received**	12/10/2009 11:52:29

Sample No	Sample Identity	Depth (m)	Test	Comment
536698	BT-3		Determination of Dissolved Gases	Container Received Empty

APPENDIX

APPENDIX

1. *Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.*
2. *Samples will be run in duplicate upon request, but an additional charge may be incurred.*
3. *If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.*
4. *With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.*
5. *We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.*
6. *When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.*
7. *If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.*
8. *If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.*
9. *NDP – No determination possible due to insufficient/unsuitable sample.*
10. *Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.*
11. *A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.*
12. ***Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted.*
13. ***Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.*
14. *Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).*
15. *Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).*
16. *Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.*
17. *Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.*
18. *In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.*
19. *Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.*
20. *For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.*
21. *For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.*
22. *We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.*
23. *Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.*

Last updated 25 June 2009

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
EPH	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
EPH CWG	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
MINERAL OIL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC FID*
PCB 7 CONGENERS	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GC MS*
PCB TOTAL	*HEXANE*	*STIRRED EXTRACTION (STIR-BAR)*	*GS MS*
SVOC	*DCM*	*LIQUID/LIQUID SHAKEN SVOC*	*GC MS*
FREE SULPHUR	*DCM*	*SOLID PHASE EXTRACTION*	*HPLC*
PEST OCP/OPP	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
TRIAZINE HERBS	*DCM/EA*	*SOLID PHASE EXTRACTION*	*GC MS*
PHENOLS MS	*DCM*	*SOLID PHASE EXTRACTION*	*GC MS*
TPH by INFRA RED (IR)	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
MINERAL OIL by IR	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
SAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
UNSAPONIFIABLE	*TCE*	*LIQUID/LIQUID EXTRACTION*	*HPLC*
GLYCOLS	*DCM*	*LIQUID/LIQUID EXTRACTION*	*EZ FLASH*

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	*D&C*	*DCM*	*SOXTHERM*	*GRAVIMETRIC*
Cyclohexane Ext. Matter	*D&C*	*CYCLOHEXANE*	*SOXTHERM*	*GRAVIMETRIC*
Thin Layer Chromatography	*D&C*	*DCM*	*SOXTHERM*	*IATROSCAN*
Elemental Sulphur	*D&C*	*DCM*	*SOXTHERM*	*HPLC*
Phenols by GCMS	*WET*	*DCM*	*SOXTHERM*	*GC-MS*
Herbicides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
Pesticides	*D&C*	*HEXANE:ACETONE*	*SOXTHERM*	*GC-MS*
EPH (DRO)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Min oil)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH (Cleaned up)	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
EPH CWG by GC	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-FID*
PCB tot / PCB con	*D&C*	*HEXANE:ACETONE*	*END OVER END*	*GC-MS*
Polyaromatic Hydrocarbons (MS)	*WET*	*HEXANE:ACETONE*	*Microwave TM218.*	*GC-MS*
C8-C40 (C6-C40)EZ Flash	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Polyaromatic Hydrocarbons Rapid GC	*WET*	*HEXANE:ACETONE*	*SHAKER*	*GC-EZ*
Semi Volatile Organic Compounds	*WET*	*DCM:ACETONE*	*SONICATE*	*GC-MS*

Last updated 25 June 2009

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy
and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in

MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which
we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	***Common Name***
Chrysotile	*White Asbestos*
Amosite	*Brown Asbestos*
Crocidolite	*Blue Asbestos*
Fibrous Actinolite	*-*
Fibrous Anthophyllite	*-*
Fibrous Tremolite	*–*

Appendix III

Emissions: Water Balance & Flare Stack Testing

Estimated volume of leachate generated in Phase 1 in 2009

Month	Rainfall (mm/month)	Area (m^3)	Effective Rainfall (% of actual)	Effective Rainfall (m)	Leachate Generated (m^3/month)
January	96	79,000	57	0.0547	432
February	18	79,000	57	0.0102	81
March	24.4	79,000	57	0.0139	109
April	74.1	79,000	57	0.0422	333
May	53.2	79,000	57	0.0303	239
June	72.8	79,000	57	0.0414	327
July	76.8	79,000	57	0.0437	345
August	71.4	79,000	57	0.0406	321
September	42.6	79,000	57	0.0242	191
October	87.2	79,000	57	0.0497	392
November	174.4	79,000	57	0.0994	785
December	54.2	79,000	57	0.0308	244
Total					**3805**

Estimated volume of leachate generated in Phase 2 in 2009

Month	Rainfall (mm/month)	Area (m^2)	Effective Rainfall (% of actual)	Effective Rainfall (m)	Leachate Generated (m^3/month)
January	96	24,000	57	0.0547	230
February	18	24,000	57	0.0102	43
March	24.4	24,000	57	0.0139	58
April	74.1	24,000	57	0.0422	177
May	53.2	24,000	57	0.0303	127
June	72.8	24,000	57	0.0414	174
July	76.8	24,000	57	0.0437	184
August	71.4	24,000	57	0.0406	171
September	42.6	24,000	57	0.0242	102
October	87.2	24,000	57	0.0497	209
November	174.4	24,000	57	0.0994	418
December	54.2	24,000	57	0.0308	130
Total					**2028.24**

Estimated volume of leachate generated in WTS in 2009

Month	Rainfall (mm/month)	Area (m^2)	Effective Rainfall (% of actual)	Effective Rainfall (m)	Leachate Generated (m^3/month)
January	96	2,450	57	0.0547	134
February	18	2,450	57	0.0102	25
March	24.4	2,450	57	0.0139	34
April	74.1	2,450	57	0.0422	103
May	53.2	2,450	57	0.0303	74
June	72.8	2,450	57	0.0414	101
July	76.8	2,450	57	0.0437	107
August	71.4	2,450	57	0.0406	99
September	42.6	2,450	57	0.0242	59
October	87.2	2,450	57	0.0497	121
November	174.4	2,450	57	0.0994	243
December	54.2	2,450	57	0.0308	75
Total					**1180**

Estimated volume of leachate generated in CA in 2009

Month	Rainfall (mm/month)	Area (m^2)	Effective Rainfall (% of actual)	Effective Rainfall (m)	Leachate Generated (m^3/month)
January	96	1,030	57	0.0547	56
February	18	1,030	57	0.0102	10
March	24.4	1,030	57	0.0139	14
April	74.1	1,030	57	0.0422	43
May	53.2	1,030	57	0.0303	31
June	72.8	1,030	57	0.0414	42
July	76.8	1,030	57	0.0437	45
August	71.4	1,030	57	0.0406	41
September	42.6	1,030	57	0.0242	25
October	87.2	1,030	57	0.0497	51
November	174.4	1,030	57	0.0994	102
December	54.2	1,030	57	0.0308	31
Total					**496**

ODOUR & ENVIRONMENTAL ENGINEERING CONSULTANTS

Unit 32 De Granville Court, Dublin Rd, Trim, Co. Meath

Tel: +353 46 9437922
Mobile: +353 86 8550401
E-mail: info@odourireland.com
www.odourireland.com

AIR EMISSION TESTING OF ONE LANDFILL FLARE LOCATED IN SILLIOT HILL WASTE MANAGEMENT FACILITY, SILLIOT HILL, BROWNSTOWN CO. KILDARE

PREFORMED BY ODOUR MONITORING IRELAND ON BEHALF OR KILDARE COUNTY COUNCIL

PREPARED BY:	*Dr. John Casey*
ATTENTION:	*Ms. Claire McLaughlin*
REFERENCE:	*Waste licence 14-1*
DATE:	*08th Feb. 2010*
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1. Introduction

This report has been prepared by Odour Monitoring Ireland and contains the results of emission testing carried out on 1 No. Enclosed ground flare at Silliot Hill waste management facility, Silliot hill, Brownstown, Co. Kildare. The emission testing was carried out in compliance with the requirements of Waste licence W0014-01.

Odour Monitoring Ireland was commissioned by Ms. Claire McLaughlin, Environment Section, Kildare County Council to perform emission testing of the 1 landfill gas flare stack located within Silliot Hill waste management facility, Silliot hill, Brownstown, Co. Kildare. The parameters listed in Table 1.1 were monitored using the appropriate instrumentation as illustrated in Table 1.1.

***Table 1.1.** Monitored parameters and techniques for Holmestown Waste Management Facility 1 No. Enclosed flare, Silliot Hill waste management facility, Silliot hill, Brownstown, Co. Kildare.*

Sample location	Parameter	Analytical method
1 Landfill Flare outlet	Volumetric airflow rate & Temperature (^{0}C)	MGO coated K type thermocouple and PT100 Volumetric airflow rate theoretical calculated for Landfill flare.
1 Landfill Flare outlet	Oxides of nitrogen (NO_X as NO_2), Carbon monoxide (CO), Carbon dioxide (CO_2), Sulphur dioxide (SO_2), and Oxygen (O_2)	Flue gas analyser, Testo 350/454 MXL
1 Landfill Flare outlet	Total Hydrocarbons and Total non methane VOC	Portable Signal 3030PM FID with Non methane flow cutter calibrated with Propane
1 Landfill Flare outlet	TA Luft Organics	Charcoal tube/GCFID
1 Landfill Flare outlet	Hydrogen fluoride & hydrogen chloride	Impinger/Ion chromatography (IC)

This report presents details of this monitoring programme. This environmental monitoring was carried out Dr. John Casey, Odour Monitoring Ireland on the 15th January 2010. Methodology, Results, Discussion and Conclusions are presented herein.

2. Materials and Methods

This section provides brief details of the methodology employed to perform emission testing of one landfill flare stack located in Silliot Hill Waste Management facility.

2.1 Volumetric flow rate and temperature measurement

The volumetric flow rate of the landfill flare was determined from theoretically calculated total volumetric flow rates using the assumptions presented in Appendix II. The inlet landfill gas velocity measurements were calculated from the CEMS monitoring system within the landfill flare control building. In addition, airflow measurement was performed on the inlet header gas main using a pitot tube and differential manometer connected to a Testo 454/350 MxL. Temperature traverse measurements were performed across the stack in one plane only. Only one plane was possible due to access port issues. A magnesium oxide K type and PT100 thermocouple was used for measuring temperature in one landfill flares and 1-gas utilisation engine.

2.2 In stack analysis of flue gases

Flue gas analysis was performed using a pre-calibrated Testo 350 MXL/454 flue gas analyser. Concentrations of oxygen, sulphur dioxide, carbon dioxide, temperature, carbon monoxide and oxides of nitrogen were measured using electrochemical cells within the analyser box and all data was logged electronically in 1 minute intervals during the sampling exercise. Data was downloaded from the control handheld using the Com soft software and average concentrations calculated are presented within. All results presented are at 273.15 K, 101.3 kPa on a dry gas basis.

2.3 TA Luft Organics

In order to obtain samples for speciated VOC assessment, a static sampling method was used where air samples were collected in pre-conditioned Tedlar sampling bags using a vacuum sampling device. The sampler operates on the "lung principle" whereby the air is removed from a rigid container around the bag by a battery powered SKC vacuum pump filling the bag inside.

All sample bags were pre-flushed with sample air in order to prevent any reductions in the actual VOC due to sample bag surface binding. A leak check was preformed on the sample setup by placing a Primary flow calibrator inline. Once sample acquisition was completed, the sample bag was transferred to another location and connected to the sample pump, tube and Primary flow calibrator. A charcoal/anasorb sorbent was chosen to efficiently bind and pre-concentrate speciated VOC for analysis by GCMS in accordance with established and accredited methodologies. Sealed SKC sorbent tubes (SKC 226-09) were used throughout the study to maintain repeatability and integrity. In addition, the sorbent tube has a second plug to detect any breakthrough. All sampling for speciated VOC's was preformed in accordance with methodologies discussed within EN 13649:2002.

2.4 Heated Flame Ionisation Detector-Total hydrocarbon concentration (THC) determination

A heated portable FID (Signal) (Test method EN12619:1999 and EN13526:2002), heated line, controller and data logger was used to analyse the duct air stream for total hydrocarbon concentration. Once stabilised and calibrated using span gas (Propane-800 ppm; European standard), a sintered probe connected to a 181 ^{0}C heated line was place in the air stream. After stabilisation, the data logger was activated and commences reading. The FID remained analysing continuously for approximately 35 minutes in the duct air stream. Results were presented as mg [THC] m^{-3} as propane.

An FID operates on the principle where influent contaminated gas is mixed with hydrogen and the mixture is burned at the tip of a jet with air or oxygen. Ions and free electrons are formed in the flame and enter a gap between two electrodes, the flame jet and a collector, mounted 0.5-1.0 centimetres above the flame tip. A potential (400 volts) is applied across the two electrodes and with the help of produced ions, a very small current flows between the two electrodes. When an organic substance is introduced this is burned in the flame; a complex process takes place in which positively charged carbon species and electrons are formed. The current is greatly increased and therefore the sample is detected. The FID is a mass flow detector, its response depending directly on the flow rate of the carrier gas. Its response also varies with applied voltage and the temperature of the flame.

The following procedure was used for operating the FID:

1. *The FID was switched on and the oven temperature and sample line temperature were allowed to stabilise. The set-point temperatures were 180 ^{0}C sample line temperature and 200^{0}C oven temperature. This took approximately 45 minutes.*
2. *The Hydrogen/He fuel and Propane calibration gases (50 and 500 ppm) were attached to the instrument.*
3. *Once temperatures had stabilised, the instrument was started and the ignition procedure was commenced.*
4. *Once ignited, the sample procedure was commenced and any VOC upon the sample line was baked off.*
5. *The analyser was zero calibrated and span calibrated. Zero air is supplied via the clean air filter. There is less than 1% of range or 1.60 mg/m^3 in eight hours whichever is greater (see Section 6.1 of EN12619:1999 and Section 6.2.1 EN13526:2001.*
6. *The analyser calibration procedure was rechecked and recorded,*
7. *The sample line was checked by presenting calibration gas in the sample line. The value was confirmed to be the value and recorded. This reading must be less than 5% difference from the span/zero reading.*
8. *The probe was inserted into the stack.*
9. *The data logger was commenced (10 second intervals) and manual readings were taking and recorded (every 10 minutes).*
10. *The instrument was re-spanned every approximately 60 minutes to confirm calibration reading and to isolate any drift.*
11. *The recorded concentrations were converted for ppm TOC propane to mg/m^3 TOC using the equation contained in Annex E and F of EN12619:1999 and EN13526:2002, respectively.*

The analyser is MCERT and TUV approved. The MCERTS certification covers EN12619:1999 and EN13526:2002.

In order to measure total non-methane VOC's, a total non-methane hydrocarbon cutter was placed in line with the FID whereby concentrations of total volatile organic carbon and total non-methane organic were displayed digitally upon the display. This allowed for the calculation of total non-methane VOC's. All results are presented in mg/Nm^3 as propane which is in accordance with the EN13526:2002 and EN12619:1999.

2.5 Hydrogen chloride (HCL) and Hydrogen fluoride (HF) analysis

Volatile chloride and fluoride gas concentrations were determined using an impinger train containing 0.10 molar sodium hydroxide and deionised water solution, in which such gases are readily soluble. The sampling methodology was based upon USEPA Method 26 and the European Standard, EN 1911. Small sorption liquid volumes were used to attain lower limits of detection. Impingers were placed in series to ensure effective trapping of chloride and fluoride gas concentrations.

The sampling probe was placed within the stack and sample air was drawn through a heated sample line and two glass midget impingers containing 0.10 molar Sodium hydroxide positioned in series. Sampled solutions were sealed and transported to the UKAS accredited

laboratory for analysis via ion chromatography (RPS Analytical laboratory, Manchester, UK). The results of mg m^{-3} have been converted to mg Nm^{-3} at 273.15 K, 101.3 kPa.

3. Results-Emission testing.

This section will present the results of the monitoring exercise.

3.1 Sampling time

Table 3.1 summarises the sampling times for stack monitoring. Table 3.2 illustrates the inlet landfill gas parameters as characterised from the CEMS analyser system operating within the landfill flare control building. In addition, manual monitoring was performed using a GA2000 landfill gas analyser. The total volume of landfill gas utilised by the landfill flare during monitoring was 449 m^3/hr.

All outlet gas samples were taken approximately 1.20 metres below the top of the stack for the landfill flare. All sampling was performed through the existing 25mm and 100 mm sampling ports on the landfill flare. A one-plane oxygen and temperature traverse was performed to assess any difference in oxygen concentrations and temperature across the sampling plane. Temperature and Oxygen differences were less than the 15% deviation level as recommended by the UK Environmental Agency (Guidance for monitoring enclosed Landfill flares, 2002).

3.2 Volumetric flow rate results

Table 3.3 summarises the theoretical airflow rate calculations for the Landfill gas flare. Table 3.3 includes the stack velocity, expressed in metres per second (m/s) and exhaust volumetric airflow rate expressed in m^3/hr at both actual and standard reference conditions of 273.15 K, 101.3 kPa (i.e. standard temperature and pressure).

3.3 Flue gas concentration results

Flue gas concentrations were monitored using a pre-calibrated Testo 350/454 MXL flue gas analyser. The results of SO_2, NO_x as NO_2 + NO, CO, and O_2 are presented in Table 3.4. The results of ppm have been converted to mg Nm^{-3} at 273.15 K, 101.3 kPa, on a dry gas basis with correction for oxygen content. In accordance with EPA flare monitoring requirements, Oxygen correction to 3% should be performed for landfill gas flare. The average temperature of the gas analyser on the day of sampling was 282.15 K.

3.4 TA Luft Organics

TA Luft Organics concentrations were monitored using sorbent tubes and analysis by GCMS. The results of TA Luft organics are presented in Table 3.4. The results are presented as mg Nm^{-3} at 273.15 K, 101.3 kPa, with correction for oxygen content. In accordance with EPA flare/gas utilisation engine monitoring requirements, Oxygen correction to 3% should be performed for landfill gas flares. The average temperature of the sampling tubes on the day of sampling was 283.15 K.

For the concentration of TOC adsorbed on to the charcoal tube, the mass amount of absorbed volatile organic carbon was measured using gas chromatography flame ionisation detector (GC-FID). Once the sampled volume is known, the mass concentration of VOC within the sampled gas could be calculated.

3.5 Total hydrocarbon concentration (THC) results

THC concentrations were monitored using a pre-calibrated FID analyser. The results of THC are presented in Table 3.4. The results of ppm have been converted to mgC/Nm^3 at 273.15 K, 101.3 kPa, with correction for oxygen content. Conversion from ppm to mgC/Nm^3 was performed using a 1.60 multiplication factor for propane. In accordance with EPA monitoring requirements, Oxygen correction to 3% should be performed for landfill flares. The average temperature of the FID on the day of sampling was 454 K.

3.6 Total non-methane volatile organic compound (TNMVOC) results

Table 3.4 illustrates the results of the continuous non-methane volatile organic compounds (TNMVOC) on the monitoring location. The monitoring of TNMVOC was performed using a TNMVOC hydrocarbon cutter and a continuous monitoring Flame ionisation detector operated in accordance with EN13526:2002. The monitoring of THC will provide the total hydrocarbon concentration including any propane or methane fraction within the airstream. The use of a hydrocarbon cutter facilitates the removal of the methane and propane fraction from the airstream and the presented results therefore consist of the non-methane fraction only.

3.7 Hydrogen chloride (HCL) and Hydrogen fluoride (HF)

Hydrogen chloride and hydrogen fluoride concentrations were monitored using an impinger train containing 0.10 molar sodium hydroxide and deionised water solution, in which such gases are readily soluble. The results of hydrogen chloride and hydrogen fluoride are presented in Table 3.4. The results of mg/m^3 have been converted to mg/Nm^3 at 273.15 K, 101.3 kPa, with correction for oxygen content. In accordance with EPA flare, Oxygen correction to 3% should be performed for a landfill gas flare.

Table 3.1. *Sampling time runs on the 15th Jan. 2010 for monitoring of landfill flare.*

Parameter	**Approx. Sampling period for 1 landfill flare**
Inlet CH_4	45 minutes
Inlet O_2	45 minutes
Volumetric air flow rate	Theoretically calculated
SO_2	45 minutes
NO_x	45 minutes
CO	45 minutes
O_2	45 minutes
CO_2	45 minutes
Stack gas temp	45 minutes
TNMVOC	45 minutes
TA Luft Organics	45 minutes

Table 3.2. *Characteristics of raw inlet gas to one enclosed Landfill flare gas burner.*

Inlet compound identity	**Compound loading Landfill flare**	**Unit values**
CH_4	24.40	%
CO_2	28.43	%
O_2	7.35	%
Total Landfill gas volumetric airflow rate	449	m^3/hr

Table 3.3. *Theoretically calculated landfill gas exhaust volume and physical characteristics from the Landfill flare.*

Parameter	***Enclosed flare***
Total Volumetric methane loading (m^3/hr)	*109.50*
Total Volumetric Oxygen loading (m^3/hr)	*33*
Ratio to complete combustion of methane assuming no excess Oxygen	*9.57*
Oxygen concentration level in flue gas (%)	*14.58*
Flue gas temperature (Kelvin)[2]	*1,208*
Theoretical calculated Volumetric exhaust airflow rate (m^3/h)	*4,842*
Normalised average exhaust airflow rate ($Nm^3\ h^{-1}$)[3]	*1,094*

Notes: *[1] denotes data from 15th Jan. 2010.*
[2] denoted converted from degrees Celsius to Kelvin (^0C + 273.15);
[3] denotes normalised to 273.15 Kelvin and 101.3 kPa.

Table 3.4. *Emission value results for one landfill gas flare.*

Parameter	Values	Units	Adjusted units (mg/m^3)	Normalised Volumetric flow rate (Nm^3/hr)	Oxygen corrected emission conc to 3 % (mg/Nm^3)[2]	Mass emission rate (kg/hr)	Emission limits
Carbon monoxide (CO)	7	ppm	8.75	1,094	24.78	0.0096	<50 mg/m^3
Temperature	935	degrees	1208K	1,094	-	-	-
Oxygen (O_2)	14.58	%	14.58	1,094	-	-	-
Total NOx [as NO_2]	14	ppm	28.75	1,094	81.43	0.0315	<150 mg/m^3
Sulphur dioxide (SO_2)	21	ppm	60	1,094	169.94	0.0657	-
Carbon dioxide (CO_2)	4.17	%	4.17	1,094	-	-	-
TOC	3.12	ppm	4.99	1,094	14.14	0.055	-
Ta Luft Organics – Class I, II and III	2.43	mg/m^3	2.43	1,094	7.39	0.0029	<20 mg/m^3 (at mass flows > 0.1 kg/hr)
Hydrogen chloride	7.13	mg/m^3	7.13	1,094	27.59	0.0107	<50 mg/m^3 (at mass flows > 0.3 kg/hr)
Hydrogen fluoride	1.18	mg/m^3	1.18	1,094	4.57	0.0018	<5 mg/m^3 (at mass flows > 0.05 kg/hr)
Volumetric air flow rate	1,094	Nm^3/hr	-	-	386	-	<3,000
Inlet methane conc	1.74 E5	mg/Nm^3	1.74 E5	-	-	190.36	-
Combustion Eff.	99	%	-	-	-	-	-

Notes: [1] *denotes refer to Appendix II for Oxygen correction calculations.*
[2] *denotes units normalised to 3% O_2 for flare.*
[3] *denotes limit values for TA Luft Organics Class I 20 mg/m^3, Class II 100 mg/m^3, Class 150 mg/m^3 total concentrations recorded are less then Class*

4. Discussion of results

Tables 3.1 to 3.4 present the results of the emission monitoring carried out on the landfill flare stack burner and one utilisation engine located in Silliot Hill Waste Management facility.

There was very little variation at one traverse in oxygen and flue gas temperature profiles across the stack during the monitoring exercise (i.e. less than 15% as recommended by the Environment Agency, UK (Environment Agency, 2002)).

A high temperature Inconel 625 and ceramic probe (Testo, Germany) was used to prevent variations in CO emissions data. Normal stainless steel probes when subjected to temperatures above 600^0C can release CO from within the structure of the material and cause the recording of erroneous results (Environment Agency, 2002).

Correction of data to 3% oxygen was performed. Due to possible inaccuracies in airflow rate measurement, it was not possible to determine the oxygen intake of the flare through the louver system using measurement. Since the volume of intake air required for complete combustion was known and the oxygen concentration in the exhaust flue gas was known, the volume of intake excess fuel air could be theoretically calculated through numerous iterations using the Solver program (i.e. Microsoft Excel). This allows for the calculation of the volume of intake excess air through the louver landfill flare intake system. These calculations were validated through use of the published Environment Agency equation (see Eqn 8.3.1) (Environment Agency, 2002).

Landfill methane destruction efficiency was calculated using the inlet methane loading concentration and the exhaust total methane hydrocarbon concentration as presented in Table 3.4. As can be observed, the landfill flare is achieving a methane destruction efficiency of greater than 99%. Typical reported concentrations of methane from landfill flare burner systems are in the order of 0.040% to 0.52%. The complete combustion of methane results in the formation of CO_2 and H_2O. The incomplete combustion of methane results in the formation of CO. CO concentration levels was low in the flue gas of the landfill flare.

5. Conclusion

The following conclusions can be drawn from this study:

1. *A theoretically exhaust flue gas volume was calculated for the landfill flare.*
2. *NO_x as NO_2, SO_2, CO, O_2, TA Luft Organics, TOC, HCL and HF monitoring and analysis was carried out in accordance with specified requirements;*
3. *All data was standardised to 273.15 Kelvin, 101.3 kPa;*
4. *All data is presented as Oxygen corrected to 3% (v/v) using the appropriate equations as presented in Section 8.2;*
5. *CO, NO_x as NO_2, HCL, HF and TA Luft Organics in the landfill flare exhaust stack were within the emission limit values specified in Schedule C.4 or Waste licence W0014-01.*

6. References

1. *Environment Agency. (2002). Guidance for Monitoring Enclosed Landfill Gas Flares. www.environment-agency.co.uk*
2. *McVay, M., (2003). Personal communication. Environment Agency, Wales, UK.*
3. *ISO 10780, (1984). Stationary source emissions-Measurement of velocity and volume flow rate of gas streams in ducts.*
- *IS EN13526:2002-Stationary source emissions-Determination of the mass concentration of total gaseous organic carbon in flue gases from solvent using processes-Continuous flame ionisation detector method.*

- *IS EN12619:1999-Stationary source emissions-Determination of the mass concentration of total gaseous organic carbon at low concentrations in flue gases-Continuous flame ionisation detector method.*
- *I.S. EN13649:2002-Stationary source emissions-Determination of the mass concentration of individual gaseous organic compounds-Activated carbon and solvent desorption method.*

7. Appendix I - Sampling, analysis and calculation details

7.1.1 Location of Sampling

Silliot Hill waste management facility, Silliot hill, Brownstown, Co. Kildare.

7.1.2 Date & Time of Sampling

15th January 2010

7.1.3 Personnel Present During Sampling

Dr. John Casey, Odour Monitoring Ireland, Trim, Co. Meath.

7.1.4 Instrumentation

Testo 350 MXL/454 in stack analyser;
Federal Method 2 S type pitot and MGO coated thermocouple;
L type pitot tube
Testo 400 handheld and appropriate probes.
Ceramic and Inconel 625 sampling probes.
Portable Signal 3030PM FID calibrated with Propane with non-methane hydrocarbon cutter.
SKC sample pumps and Bios Primary calibrator

8. Appendix II - Example calculations and conversions

8.1 Conversion of 14 ppm Oxides of nitrogen to mg Nm^{-3} at 273.15 Kelvin and 101.3 kPa (STP) for Landfill flare 1

1 mole of an ideal gas occupies 22.4 litres at standard temperature and pressure of 273.15 Kelvin[1] and 101.3 kPa (STP), where a mole of any substance is equal to its molecular mass and expressed in grams.

This is known as molar mass (i.e. the volume occupied by one gram mole of a gas at STP).

Using the average recorded concentration (in ppm) for NO_2 during the survey, the conversion is as follows:

1 mole of NO_2 occupies 22.4 litres @ STP

46 grams (Molecular weight of NO_2) occupies 22.4 litres @ STP

mg/m^3 NO_2 = 14 ppm × 46 / 22.4 = 28.75 mg/Nm^3

Notes:
[1]denotes conversion of ^0C to Kelvin: ^0C + 273 = Kelvin, normalisation temperature is the recorded temperature of the stack analyser

8.2 Additional calculations and correction of Oxygen concentration measured to reference Oxygen concentration of 3% (v/v) for 28.75 mg/Nm^3 of NO_X as NO_2 for Landfill flare.

If excess air is added to an enclosed landfill flare (i.e. to promote better combustion), measured flue gas emission concentration of non-combustion species will fall. Emission concentrations appear to be reducing, whilst in reality mass emission rates have remained constant (Environment Agency, 2002). Therefore, it is necessary to compare concentrations at a standard oxygen concentration.

The relationship between the measured oxygen concentration and measured emission species concentration is non-linear as oxygen from air is added or removed. For example, a halving of the flue gas oxygen content does not result in a doubling of the emission concentration. The oxygen concentration in the flue gases is a measure of the excess air over that required for theoretical complete combustion (i.e. stiochiometric air requirement). Therefore, the measured oxygen level is a measure of the dilution of the flue gases from the stoichiometric condition. The concentration of oxygen in dry air is 20.9% (v/v) and the proportion of excess air (X/V) can therefore be calculated from the following:

$$\frac{X}{V} = \frac{(O_2)_m}{(20.9 - (O_2)_m)} \quad \textit{(Eqn 8.3.1)}$$

Where: X is the volume of excess air (m^3);
V is the stoichiometric volume of the flue gas (m^3);
$(O_2)_m$ is the percentage of oxygen (v/v) in the flue gas (on a dry basis).

If we know and calculate the following:

The volume of landfill gas was 449 m^3/hr with a methane and oxygen concentration of 24.4% (v/v) and 7.35%(v/v) as taken from the landfill gas analyser.

This equates to a methane and oxygen volume of 109.55 m^3/hr and 33m^3/hr, respectively.

*The stiochiometric ratio of oxygen to methane for combustion is **2:1** as shown below:*

$$\mathbf{1}CH_4 + \mathbf{2}O_2 + 7.52\ N_2 \longrightarrow CO_2 + 2H_2O + 7.52\ N_2 + Heat + Light$$

*Ambient air contains 20.9% (v/v) oxygen, therefore stiochiometric volume ratio of air required for complete combustion of methane is **9.57 times** methane volume.*

Since the volume of oxygen in inlet landfill gas and stiochiometric ratio required is known, the total amount of intake air required for complete combustion is:

$$(109.55\ m^3\ h^{-1} \times 9.57) - 33\ m^3/hr = \mathbf{1{,}015.39\ m^3/hr}.\ \textit{(Eqn 8.3.2)}$$

Therefore the total volume of flue gases exhausted through stack assuming total combustion and 0% (v/v) oxygen in flue gas is:

Volume of landfill gas + Volume of Inlet air = Total Volume of flue gas

449 m^3/hr + 1,015.39 m^3/hr = 1,464 ***m^3/hr (Eqn 8.3.3)***

In reality excess inlet air is taken into the landfill flare gas burner to ensure this combustion.

The measured oxygen concentration within the flue gas of the landfill flare in Silliot Hill Waste Management Facility was 14.58 % (v/v) dry gas basis.

Therefore excess amounts of inlet air are being taken in through the louver system. As the airflow rate measurement may be highly inaccurate a back calculation method is used to calculate the amount of excess air taken into the flare burner using known combustion volume and flue gas Oxygen concentration % (v/v). This is shown below:

The following units are known:

- *Volume of flue gas assuming total combustion and 0% (v/v) oxygen in flue gas outlet $V_{Flue\ gas}$ = 1,464 m^3/hr;*
- *Volume of measured excess Oxygen % (v/v) in flue gas outlet $(O_2)_{outlet}$ = 14.58% (v/v);*
- *Volume of excess inlet air to increase flue gas to measured Oxygen % (v/v) concentration V_{inlet} = unknown*
- *Oxygen concentration in inlet air $(O_2)_{inlet}$ = 20.9% (v/v)*

Using a back calculation formula, and numerous iterations using Solver formula equation in Microsoft Excel, the volume of excess air added to the landfill flare burner system is V_{inlet} = 3,378 m^3/hr which equates to a total excess Oxygen volume $(O_2)_{volume}$ = 706 m^3/hr. Based on this, the calculated total volume of flue gas from the landfill flare would be ***4,842.8 m^3/hr.***

The following simple equation illustrates validation of the assumptions used and calculated:

$$\%O_{2Outlet} = \left(\frac{O_{2volume}}{V_{Fluegas} + V_{inlet}}\right) \times 100 \quad \textit{(Eqn 8.3.4)}$$

Referring back to Equation 8.3.1, the percentage proportion of excess air can then be calculated as below:

$$\left(\frac{3{,}378}{1{,}464} = \frac{14.58}{20.9 - 14.58}\right) \textit{(Eqn 8.3.5)}$$

Therefore the percentage proportion of excess air over required fuel air is near 230%. Equation 8.3.5 could also be used to calculate the volume of excess air.

Since the volume of excess air into the landfill flare burner is known, then the ratio of overall intake air over intake landfill gas can be calculated:

$$\text{Ratio}_{air} = \frac{3{,}378 \text{m}^3 \text{hr}^{-1}}{449 \text{m3/ hr}} \quad \textit{(Eqn 8.3.6)}$$

Therefore Ratio $_{air}$ = 7.52 which can be expressed as ***1:7.52****. This is a common occurrence in landfill flare burners although a value closer to 9 is more frequent.*

For oxygen correction, the following calculation can be performed:

$$C_r = C_m \times \frac{(20.9 - (O_2)_r)}{(20.9 - (O_2)_m)} \quad \textit{(Eqn 8.3.7)}$$

Where: C_r = referenced concentration;
C_m= measured concentration;
$(O_2)_r$ = reference oxygen concentration (3% (v/v) for Landfill flare burners);
$(O_2)_m$ = measured oxygen concentration in flue gas (14.58% (v/v)).

Hence the equation can be written as follows:

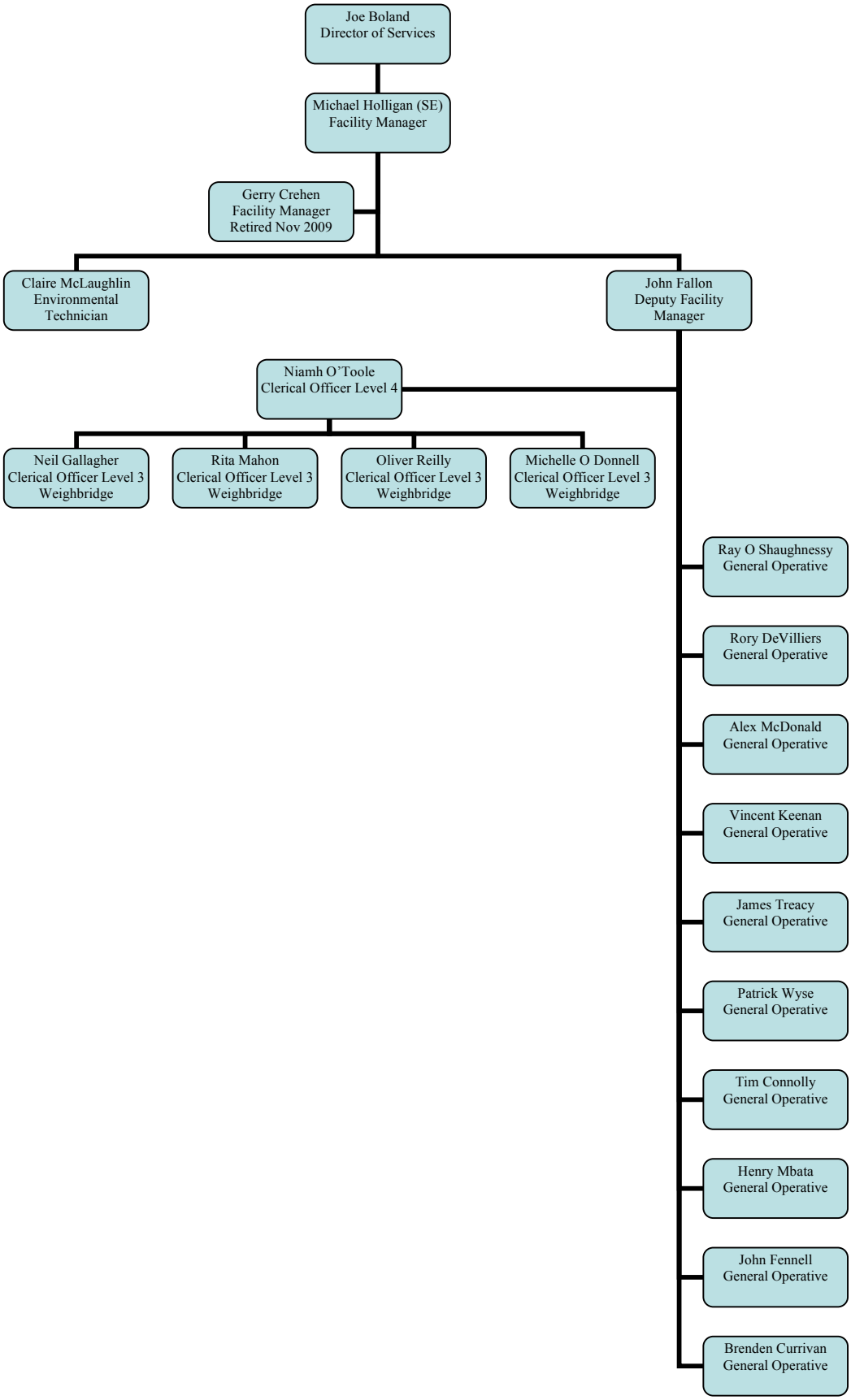
$$C_r = C_m \times \frac{17.9\%}{6.32\%} = C_r = C_m \times 2.83 \textit{ (Eqn 8.3.8)}$$

For a NO_2 concentration of 28.75 mg/Nm^3 then the oxygen corrected value (3% (v/v)) would be as follows:

$$C_r = 28.75 \times 2.8322$$ ***= 81.43 mg/Nm^3 referenced to 3% oxygen (v/v) dry gas.***

Appendix IV

Staff Structure


Joe Boland
Director of Services
Michael Holligan (SE)
Facility Manager
Gerry Crehen
Facility Manager
Retired Nov 2009
Claire McLaughlin
Environmental
Technician
John Fallon
Deputy Facility
Manager
Niamh O'Toole
Clerical Officer Level 4
Neil Gallagher
Clerical Officer Level 3
Weighbridge
Rita Mahon
Clerical Officer Level 3
Weighbridge
Oliver Reilly
Clerical Officer Level 3
Weighbridge
Michelle O Donnell
Clerical Officer Level 3
Weighbridge
Ray O Shaughnessy
General Operative
Rory DeVilliers
General Operative
Alex McDonald
General Operative
Vincent Keenan
General Operative
James Treacy
General Operative
Patrick Wyse
General Operative
Tim Connolly
General Operative
Henry Mbata
General Operative
John Fennell
General Operative
Brenden Currivan
General Operative

Appendix V

Slope Stability Report

CELEBRATING 50 YEARS in 2010

June 2010

SILLIOT HILL INTEGRATED WASTE MANAGEMENT FACILITY

Closed Landfill Slope Stability Assessment

Submitted to:
Claire McLaughlin
Kildare County Council
Silliot Hill Integrated Waste Management Facility
Kilcullen
Co. Kildare

REPORT

A world of capabilities delivered locally

Report Number. *09507190398.501/A.0*

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Table of Contents

1.0 INTRODUCTION

Kildare County Council (KCC) owns and operates an Integrated Waste Management Facility (IWMF) known as Silliot Hill in Kilcullen, Co. Kildare. This facility is a former residual waste landfill site which ceased waste acceptance in 2002 and has subsequently been capped and restored with most of the site now covered with grass with the landfill gas and leachate infrastructure visible at the surface.

The Council has developed the site to provide an IWMF which is accessible to the public and commercial operators as well as the Council. As part of this installation, a large portal framed industrial building has been constructed which functions as a waste transfer station. This building is located at or around the base level of the landfill and the waste is sloped away from the building and its access roads; in some areas, the base of this infrastructure is partly constructed on waste.

The IWMF operates within the requirements of a Waste Licence No. W0014-01.

2.0 BACKGROUND

As stated above, a Waste Licence exists for the IWMF at Silliot Hill and this covers a range of requirements. Of particular relevance to this report is Condition 8.10.2 which states:

"Within six months of the date of grant of this licence, and annually thereafter, the licensee shall carry out a stability assessment of the side slopes around the transfer station".

In order to comply with the requirements of this condition, the Council employed Fehily Timoney and Company in February 2009 to undertake a detailed numerical evaluation and assessment (Ref. 1). This assessment considered a number of slopes around the facility the failure of these slopes by different methods. This resulted in a series of Factors of Safety being presented.

In April 2010, KCC approached Golder Associates (Ireland) Ltd (Golder) to undertake an inspection of the facility slopes in order to satisfy the requirements of the licence. Golder did not propose to revisit the work undertaken by Fehily Timoney and Company, but to carry out a visual inspection of the site giving particular attention to the slopes.

3.0 SITE INSPECTION METHODOLOGY

Golder proposed to the Council that a full Stability Risk Assessment involving significant numerical evaluation and modelling was not required as the stability of the slopes had already been demonstrated by Fehily Timoney and Company. Instead, Golder proposed a visual inspection of the slopes and environs looking for the following:

- *Signs of distress – e.g. cracking, particularly at the top of the slopes;*
- *Signs of movement – e.g. bulging in the slope and/or depressions at the top of the slopes;*
- *Disturbance of or discontinuities in vegetation;*
- *Evidence of significant ingress/egress of water; and*
- *Evidence of movement or distress to surrounding structures, including roads, retaining walls and slabs.*

4.0 SITE INSPECTION

Please refer to the Photographic Plates accompanying this report.

4.1 General

Golder visited the site on the afternoon of Monday 24 May 2010 and walked over all of the slopes and upper areas of the site as well as the access to the transfer station and the surrounding roads and yards. The weather was dry and sunny, with very good visibility. No intrusive investigations were undertaken.

The dry sunny weather during the inspection had also been the prevailing conditions over the previous weeks and so there was no presence of water anywhere on the site. This meant that the adequacy and function of the installed capping and restoration drainage infrastructure which had been installed could not be assessed. However, the location and size, as well as the detailing that was visible, were all deemed to be appropriate.

Landfill gas extraction is currently active and feeds a 1500 m^3/hr flare. There is a gas engine at the site but this is not operational. It is understood that KCC is currently planning to carry out a LFG pumping trial at the site, in order to size for a new flare. It should be noted that increasing the rate of gas abstraction will lead to a change in the waste mass and this may affect the slope.

No leachate levels were provided to Golder and it is assumed that the leachate levels are controlled within limits considered in the analysis carried out by Fehily Timoney and Company.

4.2 Restored Landfill

Most of restored areas inspected, including slopes, were heavily vegetated with grass and weeds, with the exception of the to the south of the transfer station access road where, according to Council staff present at the site, the topsoil had been washed off during heavy rain prior to seed taking root. This area was sparsely covered with weeds.

The thorough visual inspection of the slopes and the land above did not indicate any signs of movement, distress or slips indicated by bulges or depressions. There were no signs of cracking due to drying shrinkage of the topsoil or, on the slope with no topsoil, the sub-soil. This indicates that, despite the prolonged dry weather, a certain amount of moisture has been retained in the materials, also evidenced by the healthy condition of the vegetation, which means that the cohesive properties of these materials are being maintained.

As mentioned above, the prolonged dry weather meant that an assessment on the performance of the drainage measures could not be ascertained and it is possible that saturation of the soil materials could occur if the drainage does not perform effectively. However, over the past year a number of significant rainfall events have occurred and the continued stability of the slopes is a fair indication that these measures are effective in preventing saturation of the soils.

4.3 Leachate and Gas Infrastructure

Various items of landfill gas and leachate management infrastructure are present on the site and these were observed from the surface without gaining entry into any chambers. None of these appeared to show signs of distress, with one notable exception which is a large manhole chamber to the north of the access road, approximately 15 m from the transfer station yard. This shows a HDPE pipe which turns through approximately 90° from under the landfill to the north of the access road, to vertical down. The bend has been squashed and pushed, suggesting that the near horizontal pipe beneath the landfill has settled forcing the bend to squash and push out the vertical section. This scenario is to be expected as the waste in the site degrades and settles and is not a sign of failure of the slopes. It is, however, recommended that this installation is reviewed by the Council to verify the function of the pipe and to take action to prevent failure if such failure poses a risk to health, safety or the environment.

4.4 Roads and Slabs

The access road leading from the wheelwash to the transfer station, as well as the concrete slabs to the southeast and northwest of the transfer station were also inspected.

The roads did not exhibit any significant deterioration that would be associated with slope failure, such as heave with associated tension cracking. The slab to the southeast of the transfer station is exhibiting signs of failure due to differential settlement, but this is not due to failure of the slopes but is likely to be due to poor sub-grade beneath the slab, possibly coupled with poor construction details.

4.5 Retaining Walls

The access road has retaining walls on both sides, approximately 1m in height. These are made up of sectional inverted 'V' units and have a 'key clamp' type handrail fitted to their upper surface. An in-situ retaining wall, approximately 2 m in height, meets these walls approximately 2 m from the end of the access road, and is continuous around the yard and through the building.

The small retaining walls adjacent to the road are all intact, although these units are most likely to be reliant on gravity only and so failure of these would be exhibited by sliding.

The larger retaining wall around the transfer station has a major crack approximately 6 m from the south eastern end. This crack is immediately adjacent to a construction joint and is approximately 50 mm at the base and 10 mm at the top and is coincident with a crack across the concrete yard slab. This crack has most likely been induced by settlement of the wall foundation and slab to the south west causing a rotation and failure at this point. Golder suggested that this has been present for a considerable time and this is reinforced by the presence of remnants of 'tell tale' crack width gauges; Council staff at the site confirmed that this is the case. Whilst this does not present an immediate risk, the crack has exposed reinforcement within the wall and deterioration of the reinforcement by corrosion, will lead to a reduction in capacity of the wall and potentially a localised failure which is likely to be minor.

5.0 SUMMARY AND CONCLUSIONS

The survey undertaken by Golder on Monday 24 May 2010, indicates that the slopes surrounding the transfer station at Silliot Hill IWMF are not showing signs of deterioration and this coupled with the detailed assessment undertaken by Fehily Timoney and Company means that the slopes are currently stable.

6.0 RECOMMENDATIONS FOR FUTURE INSPECTIONS

Based on the information made available to Golder and the site inspection undertaken on Monday 24 May 2010, Golder makes the following recommendations:

1) *Site drainage infrastructure should be observed during a period of heavy rainfall to confirm that it is functioning correctly and that excess water is not being discharged to the soils;*

2) *If active gas extraction is increased, a walkover survey similar to that as described above should be undertaken;*

3) *Monitoring of the retaining wall crack should be undertaken on a quarterly basis. This should comprise simple measurement of the crack width at, say, 0.5 m, 1 m, 1.5 m and 2 m so that changes are highlighted. Use of a plumb line to monitor the verticality of the wall either side of the crack is also recommended. In addition, photographs of the exposed reinforcement should be taken and compared with previous photographs to monitor deterioration;*

4) *During general operation of the facility, operations staff should be encouraged to advise management of anything which they observe to have changed – e.g. signs of slopes bulging, retaining walls moving, cracks forming in slopes etc. Management can then further investigate, compare to records and seek professional opinion where there is cause for concern; and*

5) *Annual inspections are to be undertaken by site management who are familiar with the site. The procedure outlined above should be followed with extensive photographic records retained, with*

photographs, where possible, taken in the same location each year so that changes can be noted. Where changes are observed an Engineer should be consulted to provide advice.

7.0 REFERENCES

1 *Fehily Timoney & Company, Slope Stability Report, Silliot Hill Integrated Waste Management Facility, Kilcullen, County Kildare, February 2009, Ref: 2006\114\01\Reports\KCC-EM_Rpt022-0.*

Report Signature Page

GOLDER ASSOCIATES IRELAND LIMITED

John Dundee
Senior Engineer

Thomas Vainio-Mattila
Senior Consultant

JD/TVM/kmck

Date: 08 June 2010

Registered in Ireland Registration No. 297875
Town Centre House, Dublin Road, Naas, Co. Kildare, Ireland
Directors: M. Gilligan, M. L. J. Maher, J. Jones (British), A. Harris (British), M. Patterson (British), D. Andreis (Italian)
VAT No.: 8297875W

APPENDIX A

Plates

Plate Nr: *1* ***Caption:*** *Waste Transfer station building*	
Plate Nr: *2* ***Caption:*** *Slope to east of building*	
Plate Nr: *3* ***Caption:*** *View along east of building (looking south)*	

Plate Nr: *4* ***Caption:*** *Further along east of building (looking south). Note regular shape of slope.*	
Plate Nr: *5* ***Caption:*** *Bench level (approx. 3 m in width) on eastern slope.*	
Plate Nr*: 6* ***Caption:*** *View (looking west) from top of eastern slope with landfill gas (LFG) infrastructure to left.*	

***Plate Nr**: 7* ***Caption:** View looking southwest from top of eastern slope.*	
***Plate Nr:** 8* ***Caption:** View looking northwest from slope above access road to the east of the building.*	
***Plate Nr:** 9* ***Caption:** Slope to south east of building, looking west past south of building.*	

Plate Nr: *10* ***Caption:*** *Looking east along slope bench ; slope to north of WTS access road.*	
Plate Nr: *11* ***Caption:*** *View along retaining wall to edge of access road with chambers visible in foreground.*	
Plate Nr: *12* ***Caption:*** *Looking north across access road to pipe chamber and slope.*	

Plate Nr: *13* ***Caption:*** *Looking northwest from access road to building. Note higher retaining wall which extends into building.*	
Plate Nr: *14* ***Caption:*** *View of retaining wall unit to north of access road.*	
Plate Nr: *15* ***Caption:*** *Retaining wall to south of yard where it meets wall adjacent to the access road.*	

Plate Nr: *16* ***Caption:*** *Looking east at slope to south of access road. Photograph taken at edge of higher retaining wall. Note regularity of slope angle.*	
Plate Nr: *17* ***Caption:*** *Again looking east as plate 16. Photograph taken further west. Note change in vegetation highlighting lack of topsoil on slope adjacent to access road.*	
Plate Nr: *18* ***Caption:*** *Close up of slope to south of access road. Note lack of topsoil.*	

Plate Nr: *19* ***Caption:*** *Looking west along top of retaining wall to south of building yard.*	
Plate Nr: *20* ***Caption:*** *Similar view to plate 19. Note wall in background (to southwest of building) dipping to left of photograph.*	
Plate Nr: *21* ***Caption:*** *View from slope to southwest of yard, looking east along yard retaining wall and access road.*	

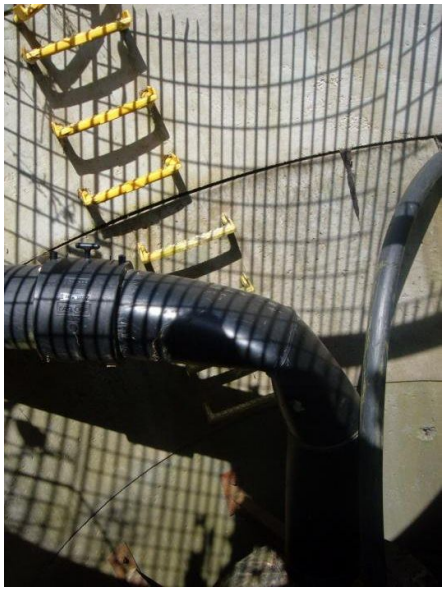
Plate Nr: *22* ***Caption:*** *Looking north along retaining wall from southwest corner of yard.*	
Plate Nr: *23* ***Caption:*** *Looking north along slope to west of building. Note gravel drainage trench running north to collection chamber.*	
Plate Nr: *24* ***Caption:*** *Higher up slope again looking north along slope to west of building. Note infrastructure to left of photograph.*	

Plate Nr: *25* ***Caption:*** *View of infrastructure referred to in plate 24.*	
Plate Nr: *26* ***Caption:*** *View of southern section of drainage trench referred to in plate 23.*	
Plate Nr: *27* ***Caption:*** *View of drainage outfall to collection chamber referred to in plate 23.*	

Plate Nr: *28* ***Caption:*** *Looking south along the western slope along the line of the gravel drainage trench.*	
Plate Nr: *29* ***Caption:*** *Further view along gravel drainage trench as plate 28. Note pipe surrounded in geotextile filter.*	
Plate Nr: *30* ***Caption:*** *View south along west of building. Note: retaining wall terminating in return to the front right of the building; regular profile of slope; infrastructure to side of building and on top of slope in background.*	

Plate Nr: *31* ***Caption:*** *Flat area above slope to south of access road. Note gravel drainage trenches and infrastructure.*	
Plate Nr: *32* ***Caption:*** *Gravel drainage trench to west and southwest of pylon in plate 31. Note regular profile of slope.*	
Plate Nr: *33* ***Caption:*** *Drainage trench outfall – note pipe wrapped in filter geotextile.*	

Plate Nr: *34* ***Caption:*** *Further site infrastructure to southwest of pylon.*	
Plate Nr: *35* ***Caption:****. Looking west along slope to south of access road. Again note regular profile of slope.*	
Plate Nr: *36* ***Caption:*** *Squeezed pipe in chamber to north of access road. See plate 12 for location.*	

Plate Nr: *37* ***Caption:****. Squeezed pipe in chamber to north of access road.*	
Plate Nr: *38* ***Caption:*** *View of retaining wall to south of yard.*	

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Africa	+ 27 11 254 4800
Asia	+ 852 2562 3658
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Ireland Limited
Town Centre House
Dublin Road
Naas
Co. Kildare
Ireland
T: +353 45 87 4411

Golder Associates