Caulmert
engineering environmental planning

Intec, Parc Menai, Bangor, Gwynedd, LL57 4FG
Tel: 01248 672666
Fax: 01248 672601
Email: jimmcclymont@caulmert.com
Web: www.caulmert.com

Aled Zachary
Natural Resources Wales

Our ref: 2306.3.POT.SDB.JDM.A0
2nd November 2015

Dear Aled,

Re: Bryn Posteg Landfill Site, Permit Number BU7766IC (Variation Notice Number EPR/BU7766IC/V004) – Quarterly Monitoring Review (July - September 2015)

In respect of Permit condition 4.2.2, a report of the monitoring and assessment carried out between the 1st of July and the 30th of September 2015 is enclosed.

The monitoring data required by permit conditions 3.6.1, for leachate in tables S4.1 and S4.9, point source emissions specified in tables S4.2, S4.3 and S4.4, groundwater specified in tables S4.5 and S4.11, landfill gas specified in tables S4.6, S4.7 and S4.8 and particulate matter in table S4.10 is submitted. This data comprises:

- Daily data for treated leachate quality;
- Weekly data for landfill gas in peripheral monitoring boreholes and groundwater levels;
- Monthly data for landfill gas in collection wells, groundwater quality, leachate levels, leachate quality, leachate discharge quality and surface water;
- Quarterly data for groundwater quality and particulate matter;

Please do not hesitate to contact me should you require any further information.

Yours sincerely,

Jim McClymont
Principal Environmental Scientist
On behalf of Caulmert Ltd

CAULMERT LIMITED

Engineering, Environmental & Planning
Consultancy Services

Bryn Posteg Landfill Site

Potters Waste Management

Quarterly Monitoring Review

July – September 2015

Prepared by:

Caulmert Limited
InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG
Tel: 01248 672666
Fax: 01248 672601
Email: jimmcclymont@caulmert.com
Web: www.caulmert.com

Doc ref: 2306.3.POT.SDB.JDM.A0

October 2015

Caulmert
Engineering, Environmental and Planning

APPROVAL RECORD

Site: **Bryn Posteg Landfill**

Client: **Potters Waste Management**

Document Title: **Quarterly Monitoring Review, July – September 2015**

Document Ref: **2306.3.POT.SDB.JDM**

Report Status: **A0**

Project Director: **Mike Caulfield**

Project Manager: **Jim McClymont**

Caulmert Limited: **InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG**

Tel: **01248 672 666**

Author	Sean O'Brien	**Date**	30/10/2015
Reviewer	Jim McClymont	**Date**	30/10/2015
Approved	Jim McClymont	**Date**	30/10/2015

DISCLAIMER

TABLE OF CONTENTS

DRAWING

APPENDICES

1.0 INTRODUCTION

1.1 Background

1.1.1 This report has been compiled in compliance with the Environmental Permit (EP) BU7766, Variation Notice Number EPR/BU7766IC/V004 for Bryn Posteg Landfill Site, which requires that the monitoring data collected at the site is reviewed quarterly. The data reviewed by this report was collected between the 1st of July and the 30th of September 2015.

1.1.2 This report records and reviews monitoring data for landfill gas, leachate, groundwater and surface water and discusses this data in relation to emission limits set in the latest EP variation. The data will also be included in an Annual Monitoring Review, as required by the EP.

1.2 Site Location and Surrounding Land-use

1.2.1 Bryn Posteg Landfill Site is located approximately 3 km south east of Llanidloes in Powys and is centered at National Grid Reference SN 971 822.

1.2.2 The landfill site was developed from the surface void of a former lead mine. Controlled land filling has taken place since 1982.

1.2.3 The site is accessed via the B4518, Llanidloes to Tylwch road. The B4518 runs parallel with the western site boundary.

1.2.4 Bryn Posteg is situated amongst predominantly agricultural land. There are four residential receptors located within approximately 325 m of the waste mass, these are:

- Valley View, 200 m to the north west;
- Rhoswen, 250 m to the east;
- Pant, 260 m to the east; and
- Penbryn Du, 325 m to the north.

2.0 LANDFILL GAS

2.1 Summary of Monitoring Results

2.1.1 Routine landfill gas (LFG) monitoring is required to be carried out on a weekly basis at 36 boreholes situated around the site perimeter. All boreholes have the prefix 'G' in the monitoring data. Concentrations of methane (CH_4) and carbon dioxide (CO_2) are measured alongside oxygen (O_2), relative pressure and atmospheric pressure on each visit.

2.1.2 CH_4 concentrations exceeded the trigger level value of 1.0 %[1] on at least one occasion at 16 monitoring locations – G-01, 11, 12, 19, 20, 21, 22, 23, 24, 25, 29, 30, 35, 38, 40, and 41. The maximum concentration was 76.2 %, detected at G-20.

2.1.3 CO_2 concentrations exceeded the trigger level value of 1.5 % on at least one occasion at 27 monitoring locations – G-01, 03, 07, 10, 11, 12, 14, 15, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 35, 37, 38, 39, 40, 41 and 42. The maximum detected concentration was 38.5 % in G-20.

2.1.4 Summary tables displaying all CH_4, CO_2 and O_2 monitoring data collected during this period are included in Appendix 1.

2.2 Gas Collection Compound Data

2.2.1 Daily gas collection data is included in Appendix 1.

[1] All gas concentrations are expressed as % v/v

3.0 GROUNDWATER

3.1 Summary of Monitoring Results

3.1.1 Groundwater is sampled at locations GW1 – GW11. GW10 cannot currently be sampled and location GW11 was dry throughout the review period. Samples were tested for a monthly suite of parameters and once, in September, for a larger quarterly suite. All monitoring data is included in Appendix 2.

3.1.2 Chloride concentration at location GW1 was significantly above the trigger limit (69 mg/l). The maximum chloride concentration in GW1 was 348 mg/l, which is slightly lower than the maximum found in GW1 during the last review period, which was 392 mg/l. Chloride concentration remained below the trigger limit at all other monitoring locations.

3.1.3 Ammoniacal nitrogen concentration remained below the trigger limit at all locations throughout the review period.

3.1.4 A full quarterly suite was undertaken in September 2015. None of the quarterly parameter trigger limits were exceeded, with the exception of a low concentration of 0.14 µg/l mecoprop at W5, which slightly exceeded the 0.1 µg/l trigger limit.

3.1.5 Quarterly parameters without trigger limits also remained within acceptable low concentrations at all locations. Low concentrations of polycyclic aromatic hydrocarbons (PAHs) were detected at GW2, GW3 and GW4. No phenols were detected at any locations during the review period.

3.2 Groundwater Levels

3.2.1 Groundwater levels were recorded weekly. The results indicated that groundwater elevation decreased steadily throughout the review period at the majority of the monitoring locations.

4.0 LEACHATE

4.1 Summary of Monitoring Results

Monitoring of leachate sumps

4.1.1 Leachate levels are measured monthly in Sump 1, Sump 2, Sump 4, Sump 5, Sump 9c and Sump 9d. Sump 3, RLMP9A and RLMP9B are sealed to improve the gas management on site. The EP limit for the liquid level within the sumps is 1 m above base. All monitoring data can be found in Appendix 3.

4.1.2 Leachate levels remained at or below the 1 m trigger level throughout the review period in all of the sumps.

4.1.3 Sump 9C and Sump 9D leachate levels were calculated as being below the base of the landfill throughout the monitoring period. This is due to the extension of the sump heads with one and two concrete rings respectively. Cover levels have not been surveyed to account for this increase in well height.

4.1.4 Leachate samples were analysed in July, August and September for pH and ammoniacal nitrogen.

4.1.5 pH remained slightly alkaline throughout the review period, ranging between 7.7 and 8.9 while ammoniacal nitrogen ranged between 280 mg/l in LC1 and 2670 mg/l in LC2.

Treated leachate

4.1.6 Treated leachate (final discharge) was tested monthly for pH, ammoniacal nitrogen, suspended solids, COD, Total Petroleum Hydrocarbons (C6 – C40), sulphate and dissolved methane.

4.1.7 Ammoniacal nitrogen and suspended solids concentration remained below the respective EP limits throughout the review period.

4.1.8 COD concentration was above the trigger level of 1000 mg/l in July, August and September at 1570 mg/l, 1370 mg/l and 1660 mg/l respectively.

4.1.9 TPH concentrations exceeded the trigger level of 'nil' in July, August and September at 476 µg/l, 690 µg/l and 4070 µg/l respectively.

4.1.10 Sulphate remained below the respective EP limits throughout the review period. pH remained within the trigger range of 6 – 10.

4.1.11 No dissolved methane was detected during the review period.

4.1.12 Potters Waste Management also undertakes daily in-situ testing of treated leachate in order to assess its suitability for discharge. Daily discharge volumes for this review period are included in Appendix 3. A total of 5892 m^3 of treated leachate was discharged between the 1st of July and the 30th of September 2015.

5.0 SURFACE WATER

5.1 Summary of Monitoring Results

5.1.1 The permit requires monthly monitoring at monitoring points P1, P2 and SW3.

5.1.2 SW3 is the discharge point for the proposed reed bed which has not yet been commissioned, hence monitoring has not commenced.

5.1.3 Surface water samples were collected at SW1 (P1) in August and September and at SW2 (P2) in July, August and September. A summary table displaying surface water monitoring data is enclosed in Appendix 4.

5.1.4 Ammoniacal nitrogen concentrations remained below the trigger limit in SW1 and SW2 throughout the review.

5.1.5 Suspended solids concentration remained below the trigger level (50 mg/l) at SW2 during the review period. The trigger level was slightly exceeded at SW1 during September with a concentration of 52 mg/l.

5.1.6 pH ranged between 7.8 and 8.3 in SW1, and 7.1 and 8.0 in SW2. Electrical conductivity was higher in SW1 with concentrations of 1390 µS/cm and 1610 µS/cm, while SW2 varied from 100 µS/cm to 149 µS/cm.

5.1.7 Chloride concentrations peaked in SW1, with a maximum of 108 mg/l in September, compared to a maximum of 15.5 mg/l in SW2. BOD was 4 mg/l and 10 mg/l in August and September respectively at SW1, and ranged between <1 mg/l and 2 mg/l in SW2.

5.1.8 Petroleum hydrocarbons were detected in SW1 during August and September, with a total concentration (EH >C6-C40) of 168 µg/l and 257 µg/l respectively. Petroleum hydrocarbons were detected in SW2 during September at a concentration of 17 µg/l.

6.0 DUST

6.1 Monitoring Results

6.1.1 Dust monitoring was undertaken between the 16th of July 2015 and the 4th of September 2015 at locations BP1, BP2 and BP3. The dust monitoring results, as supplied by the subcontracted laboratory, are summarised in Table 2 below. A Certificate of Analysis is enclosed in Appendix 5.

Table 2: Dust Monitoring Results

Period	16.07.2015 - 04.09.2015		
Location	Mass of Undissolved Solids Mg	Result mg/m²/day	Trigger Level mg/m²/day
BP 1	39.3	19	200
BP 2	58.8	29	200
BP 3	47	23	200

6.1.2 Dust concentrations remained significantly below the trigger level outlined in the EP at all locations.

7.0 SUMMARY

7.1 Landfill gas

7.1.1 The CH_4 trigger level was exceeded at 16 locations and the CO_2 trigger level was exceeded at 27 locations on a number of occasions during the monitoring period.

7.2 Groundwater

7.2.1 Groundwater elevation decreased steadily throughout the review period at the majority of the monitoring locations

7.2.2 Similar to the last quarterly review, the concentrations of all parameters were below their respective trigger levels, except chloride in GW1.

7.3 Leachate

7.3.1 Leachate levels were below the trigger limit of 1.0 m in all sumps throughout the review period.

7.3.2 In the final discharge (treated leachate) quality data, exceedances of the trigger levels for COD and TPH were recorded.

7.4 Surface Water

7.4.1 Surface water samples were collected at SW1 and SW2 during the review period. Trigger level exceedances were recorded for suspended solids in SW1 on one occasion.

7.5 Dust

7.5.1 Dust concentrations remained below the 200 mg/m^2/day trigger level at all locations.

NOTES

1. SURVEY INFORMATION PROVIDED BY POTTER'S WASTE MANAGEMENT, REF: TopoSurvey 161111A.dxf

2. LEGEND

- GAS MONITORING BOREHOLE
- GROUNDWATER MONITORING BOREHOLE
- GAS MONITORING BOREHOLE WITH GROUNDWATER MONITORING BOREHOLE
- PIPELINE
- APPROXIMATE POSITION OF SURFACE WATER MONITORING POINT
- APPROXIMATE POSITION OF DUST MONITORING POINT

SURFACE WATER MONITORING POINTS

P1 NANT-Y-BRADNANT

P2 AFON DULAS

DUST MONITORING POINTS

DMP1 VALLEY VIEW

DMP2 RHOSWEN AND PANT

DMP3 PENBRYNDU

REV	MODIFICATIONS	BY	CH	AP	DATE
A	SURVEY UPDATED	EW	TC	XX	07.02.12

POTTERS WASTE MANAGEMENT

BRYN POSTEG LANDFILL SITE

ENVIRONMENTAL MONITORING PLAN

DRAWN BY	DATE	
EW	06.02.2012	
CHECKED BY	SCALE @ A1	
TC	1:1250	
APPROVED BY	ISSUE	REVISION
JM	P	A

DRAWING NUMBER

1451.EMP.01

Caulmert
Engineering, Environmental and Planning

WWW.CAULMERT.COM

CAD FILE REF: M:\Cad Projects\1451 Bryn Posteg\Working Drawings\Preliminary Drawings\1451.EMP.01_A.dwg

Appendix 1

APPENDIX 1 – LANDFILL GAS

Table 1: Landfill Gas Monitoring Data (exceedances highlighted yellow)

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G01	02/07/2015	0.0	0.9	19.1
	09/07/2015	0.1	0.0	20.4
	16/07/2015	0.2	0.2	19.6
	13/08/2015	0.1	0.0	20.2
	20/08/2015	0.1	0.2	20.2
	27/08/2015	1.4	2.3	15.7
	03/09/2015	0.1	0.9	18.6
	09/09/2015	0.1	0.8	18.3
	23/09/2015	0.2	0.5	19.3
G02	02/07/2015	0.0	0.0	20.7
	09/07/2015	0.0	0.0	20.4
	16/07/2015	0.1	0.0	20.4
	13/08/2015	0.1	0.0	20.4
	20/08/2015	0.0	0.0	20.7
	27/08/2015	0.1	0.0	20.2
	03/09/2015	0.1	0.0	20.6
	09/09/2015	0.1	0.0	20.5
	23/09/2015	0.2	0.0	20.4
G03	02/07/2015	0.3	1.7	18.7
	09/07/2015	0.0	1.3	18.8
	16/07/2015	0.1	2.6	16.8
	13/08/2015	0.1	2.9	16.4
	20/08/2015	0.0	2.4	17.5
	27/08/2015	0.1	1.3	18.4
	03/09/2015	0.1	2.2	17.6
	09/09/2015	0.1	3.2	15.4
	23/09/2015	0.2	1.8	17.5

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G07	02/07/2015	0.0	0.2	20.6
	09/07/2015	0.0	3.5	17.9
	16/07/2015	0.1	0.8	19.9
	13/08/2015	0.1	0.8	19.9
	20/08/2015	0.0	2.0	19.2
	27/08/2015	0.1	2.2	18.8
	03/09/2015	0.1	2.3	19.1
	09/09/2015	0.1	2.0	19.4
	23/09/2015	0.2	1.5	19.8
G08	02/07/2015	0.1	0.0	20.7
	09/07/2015	0.1	0.0	20.6
	16/07/2015	0.1	0.0	20.7
	13/08/2015	0.1	0.0	20.7
	20/08/2015	0.0	0.0	20.8
	27/08/2015	0.1	0.0	20.5
	03/09/2015	0.1	0.0	20.6
	09/09/2015	0.1	0.0	20.9
	23/09/2015	0.2	0.0	20.7
G09	02/07/2015	0.0	0.0	20.8
	09/07/2015	0.0	0.0	20.6
	16/07/2015	0.1	0.0	20.8
	13/08/2015	0.1	0.0	20.8
	20/08/2015	0.0	0.0	20.9
	27/08/2015	0.1	0.0	20.5
	03/09/2015	0.1	0.0	20.7
	09/09/2015	0.1	0.0	21.0
	23/09/2015	0.2	0.0	20.7

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G10	02/07/2015	0.3	5.0	16.4
	09/07/2015	0.2	4.1	17.3
	09/07/2015	0.0	2.0	18.3
	16/07/2015	0.5	6.5	14.7
	13/08/2015	0.2	7.9	13.5
	20/08/2015	0.1	5.7	16.2
	27/08/2015	0.1	4.6	16.8
	03/09/2015	0.3	5.9	16.1
	09/09/2015	0.4	8.9	13.0
	23/09/2015	0.3	7.8	14.4
G11	02/07/2015	0.0	1.5	19.3
	09/07/2015	45.2	3.5	7.7
	16/07/2015	0.1	1.9	18.6
	13/08/2015	0.1	1.5	19.7
	20/08/2015	0.0	1.8	19.5
	27/08/2015	0.1	0.2	20.4
	03/09/2015	0.1	1.1	20.0
	09/09/2015	0.1	1.6	20.0
	23/09/2015	0.2	1.8	19.6
G12	02/07/2015	47.0	3.2	7.9
	09/07/2015	33.4	2.7	11.2
	16/07/2015	48.4	3.5	6.7
	13/08/2015	51.6	3.8	6.0
	20/08/2015	52.5	3.7	6.6
	27/08/2015	48.9	3.2	8.0
	03/09/2015	66.6	3.9	3.7
	09/09/2015	52.3	3.2	6.7
	23/09/2015	47.7	3.1	8.4

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G13	02/07/2015	0.0	0.0	20.8
	09/07/2015	0.1	0.0	20.7
	16/07/2015	0.1	0.0	20.9
	13/08/2015	0.1	0.0	20.8
	20/08/2015	0.0	0.3	20.8
	27/08/2015	0.1	0.0	20.7
	03/09/2015	0.1	0.1	20.7
	09/09/2015	0.1	0.0	21.0
	23/09/2015	0.2	0.1	20.9
G14	02/07/2015	0.0	2.7	17.9
	09/07/2015	0.0	2.5	18.1
	16/07/2015	0.1	2.6	18.2
	13/08/2015	0.1	3.1	17.4
	20/08/2015	0.0	3.4	17.1
	27/08/2015	0.1	3.0	16.5
	03/09/2015	0.1	3.0	16.7
	09/09/2015	0.1	3.6	16.0
	23/09/2015	0.2	3.2	17.8
G15	02/07/2015	0.0	0.6	19.6
	09/07/2015	0.0	0.9	19.2
	16/07/2015	0.1	1.5	18.8
	13/08/2015	0.1	1.6	18.9
	20/08/2015	0.0	1.5	19.1
	27/08/2015	0.1	2.0	18.4
	03/09/2015	0.1	2.1	18.2
	09/09/2015	0.1	1.9	18.2
	23/09/2015	0.2	1.9	18.4

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G16	02/07/2015	0.0	0.0	20.8
	09/07/2015	0.1	0.0	20.6
	16/07/2015	0.1	0.0	21.0
	13/08/2015	0.1	0.0	20.9
	20/08/2015	0.0	0.0	21.0
	27/08/2015	0.1	0.0	20.7
	03/09/2015	0.1	0.0	20.9
	09/09/2015	0.1	0.0	21.1
	23/09/2015	0.2	0.0	21.1
G17	02/07/2015	0.0	0.0	20.8
	09/07/2015	0.0	0.0	20.6
	16/07/2015	0.1	0.0	21.0
	13/08/2015	0.1	0.0	20.9
	20/08/2015	0.0	0.0	21.0
	27/08/2015	0.1	0.0	20.6
	03/09/2015	0.1	0.1	20.8
	09/09/2015	0.1	0.2	21.0
	23/09/2015	0.2	0.0	21.1
G18	02/07/2015	0.0	0.0	20.8
	09/07/2015	0.0	0.0	20.6
	16/07/2015	0.1	0.0	21.0
	13/08/2015	0.1	0.0	21.0
	20/08/2015	0.0	0.0	21.0
	27/08/2015	0.1	0.0	20.7
	03/09/2015	0.1	0.0	20.9
	09/09/2015	0.1	0.0	21.1
	23/09/2015	0.2	0.1	21.2

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G19	02/07/2015	66.3	35.3	0.2
	09/07/2015	63.8	34.4	1.0
	16/07/2015	67.1	36.4	0.2
	13/08/2015	68.1	37.0	0.2
	20/08/2015	64.8	35.4	0.8
	27/08/2015	71.9	31.4	0.2
	03/09/2015	71.7	32.4	0.2
	09/09/2015	70.4	33.7	0.2
	23/09/2015	75.1	30.3	0.2
G20	02/07/2015	65.0	36.9	0.1
	09/07/2015	65.1	36.5	0.2
	16/07/2015	67.6	36.0	0.1
	13/08/2015	66.6	39.2	0.1
	20/08/2015	65.2	39.1	0.1
	27/08/2015	76.2	25.6	0.5
	03/09/2015	72.1	32.7	0.1
	09/09/2015	70.1	34.5	0.1
	23/09/2015	62.1	38.5	0.2
G21	02/07/2015	3.3	2.3	19.6
	09/07/2015	29.4	12.7	9.5
	16/07/2015	63.8	25.4	0.1
	13/08/2015	67.5	20.4	0.1
	20/08/2015	54.9	20.2	2.2
	27/08/2015	69.2	23.9	0.8
	03/09/2015	65.2	14.2	0.1
	09/09/2015	57.6	11.8	0.1
	23/09/2015	60.7	15.3	0.1

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G22	02/07/2015	67.5	24.4	1.4
	09/07/2015	70.4	24.8	0.9
	16/07/2015	70.8	25.3	0.1
	13/08/2015	73.3	27.6	0.1
	20/08/2015	72.9	27.2	0.1
	27/08/2015	72.7	27.6	0.9
	03/09/2015	72.5	28.3	0.1
	09/09/2015	71.9	28.3	0.1
	23/09/2015	72.9	31.3	0.1
G23	02/07/2015	0.9	12.8	3.3
	09/07/2015	4.1	11.0	0.1
	16/07/2015	13.1	9.3	0.1
	13/08/2015	24.5	11.3	0.1
	20/08/2015	29.2	12.1	0.1
	27/08/2015	31.0	9.6	0.1
	03/09/2015	26.4	11.3	0.1
	09/09/2015	12.9	12.6	0.9
	23/09/2015	25.3	14.0	0.1
G24	02/07/2015	52.0	24.4	5.1
	09/07/2015	39.8	21.9	7.8
	16/07/2015	28.6	14.5	10.0
	13/08/2015	31.1	9.7	9.1
	20/08/2015	41.6	14.8	7.0
	27/08/2015	37.3	16.6	8.7
	03/09/2015	18.9	8.9	13.0
	09/09/2015	10.6	5.5	15.5
	23/09/2015	6.2	4.3	16.5

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G25	02/07/2015	47.3	12.7	0.2
	09/07/2015	50.2	11.0	0.2
	16/07/2015	51.9	10.4	0.2
	13/08/2015	61.2	12.4	0.2
	20/08/2015	62.7	10.1	0.7
	27/08/2015	58.1	19.8	0.6
	03/09/2015	49.7	21.4	2.3
	09/09/2015	44.8	20.5	2.1
	23/09/2015	50.7	21.8	0.5
	23/09/2015	50.5	21.9	2.2
G26	02/07/2015	0.0	0.8	20.4
	09/07/2015	0.1	2.8	18.6
	16/07/2015	0.1	1.6	20.0
	13/08/2015	0.1	1.7	20.0
	20/08/2015	0.1	1.9	19.7
	27/08/2015	0.1	2.3	18.8
	03/09/2015	0.1	3.2	16.9
	09/09/2015	0.1	3.8	16.3
	23/09/2015	0.2	2.1	19.9
G27	02/07/2015	0.0	0.4	20.6
	09/07/2015	0.1	0.5	20.4
	16/07/2015	0.1	0.5	20.7
	13/08/2015	0.1	0.6	20.7
	20/08/2015	0.1	2.7	19.9
	27/08/2015	0.1	0.5	20.3
	03/09/2015	0.1	2.1	19.9
	09/09/2015	0.1	3.0	19.3
	23/09/2015	0.2	2.8	20.0

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G29	02/07/2015	0.2	3.2	13.4
	09/07/2015	0.8	4.8	3.5
	16/07/2015	2.0	4.3	8.7
	13/08/2015	6.1	7.3	3.3
	20/08/2015	7.0	8.1	1.8
	27/08/2015	7.1	5.5	7.9
	03/09/2015	4.3	4.1	12.3
	09/09/2015	1.9	2.7	16.6
	23/09/2015	3.5	4.1	12.2
G30	02/07/2015	13.0	3.2	13.2
	09/07/2015	9.3	1.9	16.4
	16/07/2015	4.1	2.1	17.5
	13/08/2015	1.2	1.3	19.2
	20/08/2015	6.4	3.7	14.2
	27/08/2015	12.5	2.5	14.3
	03/09/2015	0.3	0.1	20.7
	09/09/2015	6.5	3.3	13.5
	23/09/2015	19.0	3.1	12.9
G31	02/07/2015	0.0	4.2	16.9
	09/07/2015	0.1	4.8	14.8
	16/07/2015	0.1	2.9	19.0
	13/08/2015	0.1	5.2	16.6
	20/08/2015	0.1	6.2	15.2
	27/08/2015	0.1	9.8	5.3
	03/09/2015	0.1	7.4	12.0
	09/09/2015	0.1	4.7	17.0
	23/09/2015	0.2	4.7	17.7

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G32	02/07/2015	0.0	0.0	21.0
	09/07/2015	0.1	0.0	20.8
	16/07/2015	0.1	0.0	20.8
	13/08/2015	0.1	0.3	20.7
	20/08/2015	0.0	0.5	20.6
	27/08/2015	0.1	0.5	20.0
	03/09/2015	0.1	0.8	20.3
	09/09/2015	0.1	0.5	20.0
	23/09/2015	0.2	0.3	20.9
G35	02/07/2015	72.5	23.4	0.7
	09/07/2015	64.6	25.4	1.6
	16/07/2015	71.7	31.0	0.1
	13/08/2015	73.0	29.3	0.1
	20/08/2015	73.8	27.7	0.2
	27/08/2015	66.7	37.0	0.1
	03/09/2015	67.5	37.1	0.1
	09/09/2015	64.3	35.8	0.3
	23/09/2015	31.5	23.3	6.7
G36	02/07/2015	0.0	0.2	20.9
	09/07/2015	0.1	0.3	20.5
	16/07/2015	0.1	0.3	20.5
	13/08/2015	0.1	0.3	20.5
	20/08/2015	0.1	0.4	20.4
	27/08/2015	0.1	0.3	20.2
	03/09/2015	0.1	0.6	20.2
	09/09/2015	0.1	0.5	20.1
	23/09/2015	0.2	0.5	20.7

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G37	02/07/2015	0.0	0.2	21.0
	09/07/2015	0.1	0.2	20.6
	16/07/2015	0.1	0.4	20.5
	13/08/2015	0.1	3.5	15.6
	20/08/2015	0.1	3.6	17.4
	27/08/2015	0.1	2.7	19.2
	03/09/2015	0.1	1.7	20.1
	09/09/2015	0.1	1.5	20.1
	23/09/2015	0.2	1.4	20.6
G38	02/07/2015	30.3	27.1	2.9
	09/07/2015	18.1	16.4	8.0
	16/07/2015	47.7	32.2	0.3
	13/08/2015	48.7	35.3	1.4
	20/08/2015	38.5	32.7	1.3
	27/08/2015	64.1	35.5	0.1
	03/09/2015	57.9	33.5	0.1
	09/09/2015	63.0	33.4	0.1
	09/09/2015	62.9	33.4	0.2
	23/09/2015	55.8	34.6	0.1
G39	02/07/2015	0.0	0.0	20.9
	09/07/2015	0.0	0.4	20.5
	16/07/2015	0.1	2.2	19.5
	13/08/2015	0.1	2.7	19.2
	20/08/2015	0.0	0.8	20.3
	27/08/2015	0.1	0.1	20.4
	03/09/2015	0.1	1.6	19.7
	09/09/2015	0.1	2.4	19.1
	23/09/2015	0.2	1.9	20.0

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G40	02/07/2015	0.6	0.3	20.8
	09/07/2015	0.1	0.0	21.0
	16/07/2015	7.7	16.1	4.2
	13/08/2015	2.9	10.1	9.1
	20/08/2015	0.1	0.0	20.9
	27/08/2015	46.7	32.4	0.8
	03/09/2015	33.6	30.5	0.6
	09/09/2015	9.5	17.2	3.9
	23/09/2015	13.7	20.5	5.1
G41	02/07/2015	0.7	6.3	12.3
	09/07/2015	0.1	6.0	12.0
	16/07/2015	0.9	6.7	2.6
	13/08/2015	23.9	17.2	1.1
	20/08/2015	14.0	13.9	5.9
	27/08/2015	1.9	5.9	1.7
	03/09/2015	0.6	6.3	2.2
	09/09/2015	24.0	15.2	1.0
	23/09/2015	9.8	17.7	3.2
G42	02/07/2015	0.1	1.3	20.2
	09/07/2015	0.1	0.6	20.6
	16/07/2015	0.1	0.3	20.7
	13/08/2015	0.1	3.4	18.1
	20/08/2015	0.1	1.3	20.2
	27/08/2015	0.1	0.6	20.3
	03/09/2015	0.1	0.5	20.3
	09/09/2015	0.1	0.0	20.8
	23/09/2015	0.2	0.0	21.2

APPENDIX 1 – LANDFILL GAS

Table 2: Daily gas collection monitoring data

Date	HRS RUN	TEMP	CUBIC MTS	CH4=	O2=
01-Jul-15	17614	419	690	N/A	N/A
02-Jul-15	17640	405	720	N/A	N/A
03-Jul-15	17664	388	710	N/A	N/A
06-Jul-15	17528	365	730	N/A	N/A
07-Jul-15	17759	418	750	N/A	N/A
08-Jul-15	17783	422	750	N/A	N/A
09-Jul-15	17807	393	740	N/A	N/A
10-Jul-15	17831	436	770	N/A	N/A
13-Jul-15	17903	393	700	N/A	N/A
14-Jul-15	17928	403	700	N/A	N/A
15-Jul-15	17951	498	710	N/A	N/A
20-Jul-15	18071	377	670	N/A	N/A
21-Jul-15	18095	369	670	N/A	N/A
22-Jul-15	18119	389	670	N/A	N/A
23-Jul-15	18143	533	720	N/A	N/A
24-Jul-15	17960	403	720	N/A	N/A
27-Jul-15	18239	394	700	N/A	N/A
28-Jul-15	18263	415	730	N/A	N/A
29-Jul-15	18287	387	710	N/A	N/A
30-Jul-15	18311	380	710	N/A	N/A
31-Jul-15	18336	391	710	N/A	N/A
03-Aug-15	18408	374	700	N/A	N/A
04-Aug-15	18431	389	720	N/A	N/A
05-Aug-15	18456	391	700	N/A	N/A
06-Aug-15	18479	388	700	N/A	N/A
07-Aug-15	18503	406	710	N/A	N/A
10-Aug-15	18575	392	720	N/A	N/A
11-Aug-15	18600	423	730	N/A	N/A
12-Aug-15	18623	355	710	N/A	N/A
13-Aug-15	18647	382	710	N/A	N/A
14-Aug-15	18671	380	700	N/A	N/A
17-Aug-15	18743	378	710	N/A	N/A
18-Aug-15	18767	397	710	N/A	N/A
19-Aug-15	18792	377	700	56.3%	0.31%
20-Aug-15	18815	388	700	56.3%	0.41%
21-Aug-15	18835	554	730	N/A	N/A
24-Aug-15	18905	466	720	N/A	N/A
25-Aug-15	18929	415	720	57.1%	0.42%
26-Aug-15	18953	375	690	58.2%	0.23%
27-Aug-15	18977	415	720	57.3%	0.50%
28-Aug-15	19002	372	700	57.8%	0.04%
31-Aug-15	19073	447	700	56.9%	0.42%
01-Sep-15	19097	433	710	56.5%	0.50%
02-Sep-15	19121	416	700	56.8%	0.48%
03-Sep-15	19145	476	750	55.9%	0.49%
08-Sep-15	19265	500	780	54.5%	0.56%
10-Sep-15	19313	460	750	55.2%	0.48%
11-Sep-15	19338	440	740	55.8%	0.42%
14-Sep-15	19410	499	740	57.0%	0.30%

APPENDIX 1 – LANDFILL GAS

Date	HRS RUN	TEMP	CUBIC MTS	CH4=	O2=
15-Sep-15	19434	517	790	55.3%	0.49%
16-Sep-15	19458	555	840	53.4%	65.00%
17-Sep-15	19481	457	810	51.6%	0.81%
18-Sep-15	19506	387	740	52.3%	0.69%
21-Sep-15	19577	380	760	52.7%	0.57%
22-Sep-15	19601	464	780	53.7%	0.59%
23-Sep-15	19625	403	760	52.8%	0.69%
25-Sep-15	19673	405	770	52.6%	0.74%
28-Sep-15	19746	396	780	50.9%	0.89%
29-Sep-15	19769	241	620	57.6%	0.33%
30-Sep-15	19793	292	610	57.9%	0.28%

Appendix 2

APPENDIX 2 – GROUNDWATER

Table 1: Weekly level data (measured as metres above ordinance datum)

Date	W1 (mAOD)	W2 (mAOD)	W3 (mAOD)	W4 (mAOD)	W5 (mAOD)	W6 (mAOD)	W7 (mAOD)	W8 (mAOD)	W9 (mAOD)
02/07/2015	308.31	328.52	299.50	298.34	312.27	310.45	298.78	277.54	318.93
10/07/2015	308.28	328.52	299.49	298.36	312.29	310.42	298.76	277.50	318.86
17/07/2015	308.28	328.56	299.53	298.33	312.29	310.43	298.75	277.52	318.89
24/07/2015	308.27	328.54	299.48	298.37	312.30	310.40	298.77	277.51	318.94
31/07/2015	308.02	328.58	299.51	298.33	312.32	310.45	298.81	277.47	318.93
06/08/2015	307.98	328.19	298.99	297.29	312.28	310.44	298.78	277.50	318.96
14/08/2015	307.82	327.88	298.41	296.70	311.98	309.67	296.63	277.53	318.48
20/08/2015	307.82	327.71	297.85	295.88	311.50	309.29	295.51	277.58	318.05
28/08/2015	308.00	327.55	297.30	295.37	311.58	308.91	294.57	277.47	317.65
03/09/2015	307.97	327.61	297.29	295.37	311.75	309.26	294.97	277.51	317.80
11/09/2015	307.92	327.63	297.44	295.50	311.83	309.32	295.06	277.53	317.93
18/09/2015	307.85	327.71	297.60	295.57	311.86	309.34	295.11	277.53	317.97
25/09/2015	307.91	327.69	297.63	295.51	311.91	309.30	295.08	277.50	317.86

APPENDIX 2 – GROUNDWATER

Table 2: Groundwater Monthly monitoring data

Parameter	Trigger Limit	Date	W1	W2	W3	W4	W5	W6	W7	W8	W9
Ammoniacal Nitrogen (mg/l)	2	Jul-15	0.35	<0.27	<0.27	1.12	<0.27	<0.27	<0.27	<0.27	<0.27
		Aug-15	<0.41	<0.41	<0.41	0.97	<0.41	<0.41	<0.41	<0.41	<0.41
		Sep-15	<0.41	<0.41	<0.41	0.95	<0.41	<0.41	<0.41	<0.41	<0.41
Chloride (mg/l)	69	Jul-15	344.0	42.7	16.5	19.7	29.3	22.5	15.5	17.1	14.6
		Aug-15	315.0	46.3	16.0	23.6	30.3	14.0	14.6	16.5	12.7
		Sep-15	348.0	46.0	13.8	25.4	31.7	16.6	15.9	18.0	12.3
Electrical Conductivity (µS/cm)	-	Jul-15	1090	197	340	318	236.0	170.0	304.0	278.0	179.0
		Aug-15	1040	240	438	371	269.0	185.0	329.0	293.0	208.0
		Sep-15	1110	216	341	386	306.0	180.0	315.0	282.0	365.0
Cyanide (mg/l)	-	Jul-15	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
		Aug-15	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
		Sep-15	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
pH	-	Jul-15	6.5	7.6	7.2	7.2	5.9	6.6	7.7	7.2	6.8
		Aug-15	7	8	8.3	8.1	6.9	7.6	8.2	7.9	7.8
		Sep-15	6.5	7	7.7	7.4	6.5	6.8	7.8	7.3	7.9
Sulphate (mg/l)	-	Jul-15	12.4	<1.3	70	25.8	57.6	14.2	24.7	25.1	25.6
		Aug-15	6.9	<4.4	48	28.1	64.4	13.5	27.7	26.1	26.2
		Sep-15	15.4	<4.4	9.1	29.5	70.1	17.6	25.9	25.8	26.5

Key: Above Permit Limit

APPENDIX 2 – GROUNDWATER

Table 3: Groundwater Quarterly monitoring data

Reference	Unit	Trigger	W1	W2	W3	W4	W5	W6	W7	W8	W9
Ammoniacal Nitrogen	**mg/l**	**2**	<0.41	<0.41	<0.41	0.95	<0.41	<0.41	<0.41	<0.41	<0.41
Cadmium , Total as Cd	**mg/l**	**0.0056**	0.0007	<0.0006	<0.0006	<0.0006	0.0007	0.0008	<0.0006	<0.0006	<0.0006
Nickel , Total as Ni	**mg/l**	**0.12**	0.026	0.012	0.006	0.009	0.029	0.008	<0.003	0.005	0.012
Toluene	**µg/l**	**4**	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Xylenes	**µg/l**	**3**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Zinc, Total as Zn	**mg/l**	**0.85**	0.05	0.03	0.04	<0.018	0.13	0.05	0.03	0.08	0.11
Ethyl Benzene	**µg/l**	**1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Mecoprop	**µg/l**	**0.1**	<0.04	<0.04	<0.04	0.1	0.14	<0.04	<0.04	<0.04	<0.04
2,4 - D	**µg/l**	**0.1**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

APPENDIX 2 – GROUNDWATER

Table 4: Groundwater Quarterly monitoring data (no EP trigger levels)

Reference	Unit	W1	W2	W3	W4	W5	W6	W7	W8	W9
Calcium , Total as Ca	mg/l	16.1	8.2	46.2	47.2	19.3	17.4	39.1	34.3	56.9
Chromium , Total as Cr	mg/l	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper, Total as Cu	mg/l	0.015	<0.009	0.012	<0.009	0.046	<0.009	<0.009	<0.009	<0.009
Iron , Total as Fe	mg/l	6.23	0.39	12.30	6.28	1.66	11.80	0.86	2.39	<0.23
Lead , Total as Pb	mg/l	0.01	<0.006	0.136	<0.006	0.017	0.009	0.058	0.071	<0.006
Magnesium, Total as Mg	mg/l	5.60	1.30	10.50	10.40	5.20	3.70	6.10	8.60	6.00
Manganese , Total as Mn	mg/l	2.42	0.03	5.98	4.37	2.59	3.27	0.48	0.85	0.77
Mercury, Total as Hg	mg/l	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Potassium , Total as K	mg/l	1.6	2.17	1.65	2.14	2.32	0.91	2.83	1.45	1.29
Silver , Total as Ag	mg/l	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Sodium , Total as Na	mg/l	180.0	29.6	9.4	11.2	15.4	7.7	17.8	8.3	12.1
pH	-	6.5	7.0	7.7	7.4	6.5	6.8	7.8	7.3	7.9
Conductivity- Electrical 20C	uS/cm	1110	216	341	386	306	180	315	282	365
Alkalinity as CaCO3	mg/l	25.5	36.6	166	142	13.3	48.5	126	102	164
Bicarbonate Alkalinity	mg/l	25.5	36.6	166	142	13.3	48.5	126	102	164
Nitrate as N	mg/l	<0.7	<0.7	<0.7	<0.7	0.8	<0.7	<0.7	<0.7	<0.7
Sulphate as SO4	mg/l	15.4	<4.4	9.1	29.5	70.1	17.6	25.9	25.8	26.5
Dissolved Oxygen	mg/l	1.2	0.9	4.4	1.6	1.1	0.7	1.4	<0.5	3.5
Cyanide, Total as CN	mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Phenols Mono (Phenol Index)	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (a) anthracene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (g,h,i) perylene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (a) pyrene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (b) fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (k) fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz (a,h) anthracene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01

APPENDIX 2 – GROUNDWATER

Reference	Unit	W1	W2	W3	W4	W5	W6	W7	W8	W9
Fluorene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno (1,2,3) cd pyrene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.01	0.021	0.021	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.01	0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
PAH, Total	ug/l	<0.01	0.031	0.021	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Antimony, Total as Sb	mg/l	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	0.0013	<0.0012
Arsenic, Total as As	mg/l	0.025	0.0011	0.035	0.008	0.0051	0.03	<0.0010	0.0026	<0.0010
m&p Xylene	ug/l	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Selenium, Total as Se	mg/l	<0.0008	<0.0008	0.0011	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008

Appendix 3

APPENDIX 3 – LEACHATE

Table 1: Monthly leachate level data

Location	Sump 1			Sump 2			Sump 4			Sump 5		
	Cover Level (mAOD)		318.9	Cover Level (mAOD)		350	Cover Level (mAOD)		324.91	Cover Level (mAOD)		321.9
	Base (mAOD)		313.4	Base (mAOD)		310.9	Base (mAOD)		310.75	Base (mAOD)		310.75
Date	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)
Jul-15	4.68	314.2	0.8	DRY	-	0.0	13.52	311.4	0.6	10.45	311.5	0.7
Aug-15	4.70	314.2	0.8	DRY	-	0.0	13.55	311.4	0.6	10.45	311.5	0.7
Sep-15	4.78	314.1	0.7	DRY	-	0.0	13.60	311.3	0.6	10.54	311.4	0.6
Trigger Level			1			1			1			1

Location	Sump 9C			Sump 9D		
	Cover Level (mAOD)		310.88*	Cover Level (mAOD)		311.57*
	Base (mAOD)		307	Base (mAOD)		307
Date	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)
Jul-15	6.20	304.7	-2.3	7.80	303.8	-3.2
Aug-15	6.30	304.6	-2.4	7.70	303.9	-3.1
Sep-15	6.20	304.7	-2.3	7.80	303.8	-3.2
EP Limit			1			1

* In March 2015 Sumps 9c and 9d received one and two concrete rings respectively. Cover levels have not yet been surveyed.

APPENDIX 3 – LEACHATE

Table 2: Monthly leachate monitoring data

LOCATION	DATE	pH	Ammoniacal Nitrogen as N
		pH units	mg/l
Leachate 1	Jul-15	7.8	694
	Aug-15	8.2	280
	Sep-15	8.3	497
Leachate 2	Jul-15	8.2	2670
	Aug-15	8.9	2290
	Sep-15	8.8	2660
Leachate 4	Jul-15	7.7	196
	Aug-15	8.0	310
	Sep-15	8.0	930
Leachate 5	Jul-15	7.8	971
	Aug-15	8.2	853
	Sep-15	8.2	1260
Leachate 7	Jul-15	-	-
	Aug-15	7.8	1380
	Sep-15	-	-

APPENDIX 3 – LEACHATE

Table 4: Final discharge monthly monitoring data (EP exceedances highlighted)

LOCATION	DATE	pH	Ammoniacal Nitrogen as N	Suspended Solids	COD (1 hr settled)	Total TPH (EH>C6 - C40)	Sulphate as SO4	Dissolved Methane
		pH units	mg/l	mg/l	mg/l	µg/l	mg/l	mg/l
Trigger Levels		**6 - 10**	**150**	**500**	**1000**	**nil**	**1000**	**N/A**
Treated Leachate	**Jul-15**	7.5	0.66	332	1570	476	75	<0.010
	Aug-15	7.7	0.79	376	1370	690	96.1	<0.010
	Sep-15	6.5	15.9	388	1660	4070	76.4	<0.010

APPENDIX 3 – LEACHATE

Table 5: Final discharge daily discharge data

DATE	Actual Discharge (m3)
01-Jul-15	90
02-Jul-15	71
03-Jul-15	0
06-Jul-15	0
07-Jul-15	51
08-Jul-15	90
09-Jul-15	89
10-Jul-15	111
13-Jul-15	89
14-Jul-15	109
15-Jul-15	96
16-Jul-15	114
17-Jul-15	114
20-Jul-15	0
21-Jul-15	120
22-Jul-15	0
23-Jul-15	0
24-Jul-15	0
27-Jul-15	101
28-Jul-15	124
29-Jul-15	118
30-Jul-15	98
31-Jul-15	121
03-Aug-15	0
04-Aug-15	116
05-Aug-15	121
06-Aug-15	100
07-Aug-15	115
10-Aug-15	0
11-Aug-15	64
12-Aug-15	111
13-Aug-15	81
14-Aug-15	87
17-Aug-15	0
18-Aug-15	32
19-Aug-15	72
20-Aug-15	117
21-Aug-15	63
24-Aug-15	55
25-Aug-15	66
26-Aug-15	172
27-Aug-15	130
28-Aug-15	108
31-Aug-15	99
01-Sep-15	251
02-Sep-15	0
03-Sep-15	45
04-Sep-15	119
07-Sep-15	59
08-Sep-15	160
09-Sep-15	121
10-Sep-15	109
11-Sep-15	88
14-Sep-15	63
15-Sep-15	123
16-Sep-15	143

APPENDIX 3 – LEACHATE

DATE	Actual Discharge (m3)
17-Sep-15	124
18-Sep-15	123
21-Sep-15	61
22-Sep-15	159
23-Sep-15	125
24-Sep-15	-
25-Sep-15	276
28-Sep-15	24
29-Sep-15	159
30-Sep-15	145

Appendix 4

APPENDIX 4 – SURFACE WATER

Table 1: Monthly Monitoring Data

LOCATION	DATE	pH	Conductivity-Electrical 20C	Ammoniacal Nitrogen as N (LL)	Chloride as Cl	Total Suspended Solids	BOD + ATU (5 day)	EH >C6 - C40	EH >C6 - C8	EH >C8 - C10	EH >C16 - C24	EH >C24 - C40	EH >C10 - C16
		pH units	µS/cm	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Trigger Level		6 - 9	N/A	0.25	N/A	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SW 1	Aug-15	8.3	1390	<0.06	92.3	44	4	168	<10	<10	108	46	14
	Sep-15	7.8	1610	0.2	108.0	52.0	10.0	257.0	<10	<10	171.0	69.0	18.0
SW 2	Jul-15	7.4	100	<0.06	15.5	2	2	<20	<20	<20	<20	<20	<20
	Aug-15	8.0	149	<0.06	12.2	2	<1	<10	<10	<10	<10	<10	<10
	Sep-15	7.1	108	<0.06	12.5	3	<1	17	<10	<10	<10	17	<10

Appendix 5

ALS Environmental Ltd
Torrington Avenue
Coventry
CV4 9GU

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

Mr Williams
Potters Waste Management
Potters Yard
Severn Road
Welshpool SY21 7YE
Powys

15 September 2015

Test Report: COV/1215876/2015

Dear Mr Williams

Analysis of your sample(s) submitted on 04 September 2015 is now complete and we have pleasure in enclosing the appropriate test report(s).

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

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

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

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

Yours Sincerely,

Signed: 

Name: A. Zunzunegui

Title: Organic Team Leader

Report Summary

Mr David Williams
Potters Waste Management
Potters Yard
Severn Road
Welshpool
Powys
SY21 7YE

Date of Issue: **15 September 2015**

Report Number: **COV/1215876/2015** Issue **1**

Job Description: Waste Water Analysis

Job Location: Waste Water Analysis

Number of Samples included in this report **3**

Job Received: **04 September 2015**

Number of Test Results included in this report **21**

Analysis Commenced: **10 September 2015**

Signed:

Name: **A. Zunzunegui** Date: **15 September 2015**

Title: **Organic Team Leader**

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

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

Certificate of Analysis

Report Number: **COV/1215876/2015** Issue **1**
Laboratory Number: **14808873** Sample **1** of **3**

Sample Source: **Potters Waste Management**
Sample Point Description: **Potters Waste**
Sample Description: **BP1**
Sample Matrix: **Dust**
Sample Date/Time: **04 September 2015**
Sample Received: **04 September 2015**
Analysis Complete: **15 September 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Description of Dust	Analyst Com	Text	10/09/2015	N Cov	74
Date In	04/09/2015	dd/mm/yy	14/09/2015	N Cov	74
Date Out	16/07/2015	dd/mm/yy	14/09/2015	N Cov	74
Number of Days Exposed	50		14/09/2015	N Cov	74/77
Mass of Undissolved Solids	39.3	mg	10/09/2015	N Cov	74
Deposited Dust, Total, Calc.	19	mg/m2/day	15/09/2015	N Cov	74
Frisbee Diameter	227	mm	14/09/2015	N Cov	74

Analyst Comments for 14808873: {/*}Green, Heavy depositon. Algae present{*/}

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

Signed: Name: **A. Zunzunegui** Date: **15 September 2015**
Title: **Organic Team Leader**

Certificate of Analysis

Report Number: **COV/1215876/2015** Issue **1**
Laboratory Number: **14808874** Sample **2** of **3**

Sample Source: **Potters Waste Management**
Sample Point Description: **Potters Waste**
Sample Description: **BP2**
Sample Matrix: **Dust**
Sample Date/Time: **04 September 2015**
Sample Received: **04 September 2015**
Analysis Complete: **15 September 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Description of Dust	Analyst Com	Text	10/09/2015	N Cov	74
Date In	04/09/2015	dd/mm/yy	14/09/2015	N Cov	74
Date Out	16/07/2015	dd/mm/yy	14/09/2015	N Cov	74
Number of Days Exposed	50		14/09/2015	N Cov	74/77
Mass of Undissolved Solids	58.8	mg	10/09/2015	N Cov	74
Deposited Dust, Total, Calc.	29	mg/m2/day	15/09/2015	N Cov	74
Frisbee Diameter	227	mm	14/09/2015	N Cov	74

Analyst Comments for 14808874: {/*}Green, Heavy depositon. Algae present{*/}

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

Signed: Name: **A. Zunzunegui** Date: **15 September 2015**
Title: **Organic Team Leader**

Certificate of Analysis

Report Number: **COV/1215876/2015** Issue **1**
Laboratory Number: **14808875** Sample **3** of **3**

Sample Source: **Potters Waste Management**
Sample Point Description: **Potters Waste**
Sample Description: **BP3**
Sample Matrix: **Dust**
Sample Date/Time: **04 September 2015**
Sample Received: **04 September 2015**
Analysis Complete: **15 September 2015**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Description of Dust	Analyst Com	Text	10/09/2015	N Cov	74
Date In	04/09/2015	dd/mm/yy	14/09/2015	N Cov	74
Date Out	16/07/2015	dd/mm/yy	14/09/2015	N Cov	74
Number of Days Exposed	50		14/09/2015	N Cov	74/77
Mass of Undissolved Solids	47.0	mg	10/09/2015	N Cov	74
Deposited Dust, Total, Calc.	23	mg/m2/day	15/09/2015	N Cov	74
Frisbee Diameter	227	mm	14/09/2015	N Cov	74

Analyst Comments for 14808875: {/*}Brown, Heavy depositon. {*/}

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

Signed: Name: **A. Zunzunegui** Date: **15 September 2015**
Title: **Organic Team Leader**

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

Caulmert
Engineering, Environmental and Planning

Registered Office: Intec, Parc Menai, Bangor, Gwynedd, LL57 4FG
Tel: 01248 672666
Fax: 01248 672601
Email: contact@caulmert.com
Web: www.caulmert.com