

Battlefield Energy From Waste Facility

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Annual Report 2018 EPR/XP3239GF

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Approved Date: 17/01/19

Version 1

Contents

1. INTRODUCTION.....	3
2. FACILITY INFORMATION	3
3. OPERATIONAL INFORMATION	5
4. EMISSIONS TO AIR.....	7
4.1 Continuous Emissions	8
4.2 Extractive Sampling.....	9
4.3 Annual Mass Emissions	9
5 INCINERATOR BOTTOM ASH (IBA) AND AIR POLLUTION CONTROL (APC) RESIDUE.....	9
5.1 IBA	9
5.2 APC	10
6 ENVIRONMENTAL CONTROLS	10
APPENDIX A.....	12
APPENDIX B	12
APPENDIX C	18

Version control

Version Number	Date issued	Author	Update information
V1	17/01/19	Christine Skaramaga	Initial issue

1. INTRODUCTION

This is the Annual Performance Report for the Battlefield Energy Recovery Facility (Battlefield ERF) for 2018.

2. FACILITY INFORMATION

Plant Operator	Veolia ES Shropshire Ltd
Name of Facility	Battlefield Energy From Waste Facility
EPR Permit Number	XP3239GF
Facility Address	Veolia ES Shropshire Limited Vanguard Way Shrewsbury Shropshire SY1 3TG
Telephone Number	02035674600

The plant is operated by Veolia Shropshire Ltd, a wholly owned subsidiary of Veolia. The plant is designed to burn predominantly residual municipal solid waste and has the capacity to process up to 12 tonnes per hour or a Permitted 102,000 tonnes annually. The facility has been built to serve Shropshire Council.

The facility can generate approximately 8MW of electricity from waste. The facility uses approximately 1MW and the balance is exported to the national grid. In tangible terms the total electricity generated is equivalent to that used by, in the region of, 10,000 homes.

The facility is designed so that it can supply heat, if a client becomes available in the future.

Technical details of the plant:

- Constructions Industrielles de la Mediterranee (CNIM) - Design
- Maximum Permitted Refuse throughput – 102,000 tonnes per annum
- One waste stream with a capacity of 12 tonnes per hour.
- Storage capacity 1200 (useable) Tonnes – Approximately 100 hours full plant capacity
- Number of tipping bays – 4
- Steam output – 38 tonnes of steam per hour at 400°C & 60 BAR
- Flue gas treatment – CNIM urea injection for the reduction of NOx, dry lime injection for the removal of acid gases, activated carbon injection for removal of metals and dioxins followed by high performance bag filters for removal of particulates, dispersal via one 65 metre high stack.
- Maximum energy generating capacity approximately 8MW

The facility is permitted to accept the following waste types:

Table S3.1 Raw materials and fuels

Raw materials and fuel description	Specification
Gas oil	Less than 0.1% sulphur

Table S3.2 Permitted waste types and quantities for incineration

Maximum quantity 102,000 tonnes per annum in total	
Waste code	Description
19 12 07	Wood other than that mentioned in 19 12 06
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11*
20 03 01	Mixed municipal waste
20 03 02	Waste from markets
20 03 03	Street cleaning residues
20 03 07	Bulky waste
20 01 38	Wood other than that mentioned in 20 01 37 ^{Note 1}

3. OPERATIONAL INFORMATION

Operational Details		
Operational hours	8279	Hours
Total Waste Incinerated	96492	Tonnes
Total Municipal Waste Incinerated	95691	Tonnes
Total Commercial Waste Incinerated	801	Tonnes
Metals Recovered	2475	Tonnes
Incinerator Bottom Ash Produced	18750	Tonnes
APC Residues	2401	Tonnes

Reporting of Water and Other Raw Material Usage for the year 2018

Raw Material	Usage	Unit	Specific Usage	Unit
Mains water	19958	m ³	210	kg/t
Total water usage	19958	m ³	210	kg/t
Urea	179	Tonnes	1.9	Kg/t
Activated carbon	34	Tonnes	0.4	kg/t
Lime/hydrated lime	948	Tonnes	9.8	kg/t

(Specific Usage is measured in kg/tonne waste incinerated)

Reporting of Energy Usage/Export for the year 2018

Energy Source	Energy (MWh)	Specific energy	Units
Electricity produced	64949	672	KWh/tonne of waste incinerated (dry basis)
Electricity imported	186	1.9	
Electricity Exported	59130	613	
Electricity used by ERF	6005	62	
Gas Oil	94896	1	L/tonne of waste incinerated (dry basis)
Thermal Energy produced (Steam Production)	316495	3.3	Tonnes/Tonne waste incinerated
Waste heat utilised by ERF	0	0	KWh/tonne of waste incinerated (dry basis)

Reporting of Waste Disposal and Recovery for the year 2018

Waste Description	Disposal Route	Annual Tonnes	Recovery Tonnes	Kg / Tonne Waste
1) Hazardous Wastes		0	0	0
APC Residues	Empire /Minosus	2401	0	25
IBA which is classified as hazardous waste		0	0	0
Total hazardous waste	Empire /Minosus	2401	0	25
2) Non-Hazardous Wastes				
IBA	Recycling	18750	18750	187
Other non-hazardous wastes	Metals Recycled	2475	2475	26
Total non-hazardous waste		21225	21225	220
TOTAL WASTE	-	23626	21225	245

Reporting of other performance indicators for the period 2018

Parameter	Result
Number of periods of WID abnormal operation	0
Cumulative hours of WID abnormal operation for 2018	0

Parameter	Result
Number of Breaches of Permit in 2018	None
Dates	

4. EMISSIONS TO AIR

The furnace is fitted with an independent dry urea system in order to reduce NO_x emissions to air via selective non-catalytic reduction (SNCR). A dry flue gas treatment system is used to neutralise acid flue gases with the injection of hydrated lime into the reaction chamber. Activated carbon is injected into the flue gases in order to help reduce the concentrations of heavy metals and dioxins in the combustion gases emitted to air. Bag filters are used to separate out the resulting particulate matter from the cooled and treated gases. Gases are finally released to atmosphere via the 65m chimney. In compliance with the IED and EPR Permit, MCERTS accredited equipment is installed in the stack, which continuously monitors a range of determinants.

In addition to the continuous monitoring, an extractive sampling campaign is undertaken on a biannual basis by an approved service supplier. The organisation used for analysis and monitoring are accredited by the United Kingdom Accreditation Service (UKAS) and the Environment Agency's Monitoring Certification Scheme (MCERTS).

The parameters measured and their frequency of monitoring, for the second and subsequent years of operation, are summarised.

Parameters	Continuous	Jan – Jun	Jul – Dec
Particulate Matter	✓		
TOC	✓		
Hydrogen Chloride	✓		
Oxides of Nitrogen	✓		
Carbon Monoxide	✓		
Sulphur Dioxides	✓		
Ammonia	✓		
Nitrous Oxide		✓	✓
Hydrogen Fluoride		✓	✓
Mercury		✓	✓
Arsenic		✓	✓
Cadmium		✓	✓
Chromium		✓	✓
Copper		✓	✓
Cobalt		✓	✓
Nickel		✓	✓
Manganese		✓	✓
Antimony		✓	✓
Lead		✓	✓
Thallium		✓	✓
Vanadium		✓	✓
Dioxins and Furans		✓	✓
Dioxin-like PCBs		✓	✓
PAHs		✓	✓

4.1 Continuous Emissions

Continuous emissions monitoring of six main pollutants with ELVs is undertaken, using MCERTS approved instruments. The pollutants measured in this way comprise: particulates, total organic carbon, carbon monoxide, sulphur dioxide and oxides of nitrogen.

Each pollutant has its own Emission Limit Value (ELV). A summary is shown below.

Pollutant	Chemical Symbol	ELV	Measurement	Monitoring Standard
Particulates	PMx	30mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		10mg/m3	daily average	
Total Organic Carbon	TOC	20mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		10mg/m3	daily average	
Hydrogen Chloride	HCL	60mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		10mg/m3	daily average	
Carbon Monoxide	CO	150mg/m3	10 minute average	BS EN 14181 and BS EN 15267-3
		50mg/m3	daily average	
Sulphur Dioxide	SO2	200mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		50mg/m3	daily average	
Oxides of Nitrogen	NO and NO2 as NOX	400mg/m3	half hour average	BS EN 14181 and BS EN 15267-3
		200mg/m3	daily average	

A summary of the continuous emissions can be seen below for 2018 with the monthly averages being those of the average daily concentrations:

Monthly Averages – from daily averages

	Limit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dust	10	0.6	0.7	0.7	0.4	0.2	0.2	0.2	0.2	0.4	0.2	0.2	0.2
Total Organic Carbon	10	0.4	0.4	0.6	0.3	0.3	0.3	0.2	0.1	0.2	0.5	0.5	0.6
Hydrogen Chloride	10	6	6	5	6	7	7	7	7	7	7	6	6
Carbon Monoxide	50	9	10	9	8	8	7	9	8	8	8	9	9
Sulphur Dioxide	50	18	19	23	20	15	15	13	12	11	12	19	20
Oxides of Nitrogen	200	172	172	173	172	172	172	172	172	172	172	172	172

The above data is communicated monthly to the public via our Veolia website in terms of a percentage of each ELV. A more detailed IED report is sent to the EA each month showing emissions per pollutant per month in terms of half hourly averages and daily averages.

4.2 Extractive Sampling

Typically these pollutants are far harder to measure and are only present in very low concentrations so are taken from the stack using appropriate methodologies.

Extractive testing data is shown in Appendix B.

4.3 Annual Mass Emissions

CEMS gas mass emissions are calculated by the MCERT Software developed by CBISS. These are shown in Appendix B.

An interpretation of the CEMS Mass Emission is that there is generally good control of the process. Extractive mass emissions are calculated by using CEMS data and extractive results.

Annual Mass Emissions		
Parameter	Units	Annual Total
Hydrogen Fluoride	Kg	17.92
Mercury	Kg	3.06
Arsenic	Kg	0.31
Cadmium	Kg	0.38
Chromium	Kg	1.12
Copper	Kg	1.37
Nickel	Kg	1.28
Manganese	Kg	1.95
Antimony	Kg	0.51
Lead	Kg	1.0
Thallium	Kg	0.34
Dioxins and Furans I-TEQ*	Kg	0.000005
PAHs	Kg	0.50
PCBs Actual mass i.e. not toxic equivalence adjusted	Kg	0.00015

*Non-detects included

5 INCINERATOR BOTTOM ASH (IBA) AND AIR POLLUTION CONTROL (APC) RESIDUE

5.1 IBA

The plant has undergone rigorous testing to prove that the IBA is non-hazardous. The IBA is of a consistently high standard and there have been no failures in the last 24 samples. IBA is transported to KSD in Denton, where it is reprocessed into a number of different graded aggregates. Metals are further extracted from the process and recycled.

The metals tested in the IBA are Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc and their compounds. Dioxins/Furans and dioxin-like PCB's are also tested. We monitor Total Organic Carbon in the sample for compliance.

Frequency	Monitoring	Test	Limit
Monthly	IBA	LOI	<5%
Monthly	IBA	Metals, dioxins/furans and dioxin-like PCB's	No limit

The results can be seen in Appendix C.

An interpretation shows that the results are uniform, that the IBA quality does not vary a great deal and is fully compliant.

5.2 APC

APC residue is the fine particulate matter that is removed at the end of the gas cleansing process. It contains residues from the waste gas and the reactants used to treat the gas. APC is captured in the bag house filters in the plant before the gas is emitted and dispersed through the ERF's 65m stack. The APC from the Battlefield ERF is sent to another Veolia facility for treatment, Empire Works or for permanent underground storage at Minosus.

The results can be seen in Appendix C.

An interpretation shows that the results are uniform, that the APC quality does not vary a great deal and is fully compliant.

6 ENVIRONMENTAL CONTROLS

Battlefield ERF has an experienced Veolia management team from other existing plants. The plant has been designed using proven technology and experience and is operating well. The plant supports our company ethos, as we operate 10 facilities in the UK. Reliable environmental controls and a robust management system ensures compliance with the Industrial Emissions Directive and EPR Permit.

Veolia staff are aware of the environmental impacts of their work and exercise a high standard of housekeeping. Training and competency of staff is controlled by the Veolia Business Management System. The Management System covers training, awareness and competence. The company identifies the training requirements of its employees and provides suitable resources to ensure they have the required knowledge, skills and expertise to carry out their duties.

APPENDIX A – EXTRACTIVE EMISSIONS
APPENDIX B – MASS EMISSIONS
APPENDIX C – IBA AND APC RESULTS

APPENDIX A

Permit Number: EPR/XP3239GF Operator: Veolia

Facility: Battlefield EFW

Reporting of periodically monitored emissions to air for the period from 01/01/18 to 31/06/18 Quarter 1&2

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ⁽¹⁾	Test Method	Result Date and Time ⁽²⁾	Uncertainty ⁽³⁾
A1	Hydrogen fluoride	2 mg/m ³	Periodic over minimum 1-hour period	0.03 mg/m ³	BS ISO 15713	12/04/2018; 10:00 – 11:00	14%
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.001 mg/m ³	BS EN 14385	12/04/2018; 07:45 – 09:46	8%
A1	Mercury and its compounds	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.004 mg/m ³	BS EN 14385	12/04/2018; 07:45 – 09:46	13%
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.0097 mg/m ³	BS EN 14385	12/04/2018; 07:45 – 09:46	4%
A1	N ₂ O	No limit applies	Periodic Over minimum 1-hour period	13.12 mg/m ³	EA TGN M22	10/04/2018; 11:00 – 12:00	8%
A1	Dioxins / Furans (I-TEQ)	0.1 ng/m ³	over minimum 6 hour period, maximum 8 hour period	0.00033-0.0048 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	16%
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0003-0.0054 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	17%
A1	Dioxins / furans (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000029-0.0049 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	19%
A1	Dioxins / furans (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000029-0.008 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	20%
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.00057-0.0006 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	20%
A1	Dioxin-like PCBs (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000036-0.000036 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	17%
A1	Dioxin-like PCBs (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0031-0.0031 ng/m ³	BS EN 1948	11/04/2018; 07:42 – 13:45	13%
A1	Poly-cyclic aromatic	No limit	over minimum 6 hour period,	0.88 ug/m ³	BS ISO 11338	10/04/2018; 07:35 – 13:36	11%

A1	Poly-cyclic aromatic hydrocarbons (PAHs) Total	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.88 ug/m ³	BS ISO 11338	10/04/2018; 07:35 – 13:36	11%
A1	Anthanthrene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[a]anthracene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[b]fluoranthene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[k]fluoranthene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[b]naph(2,1-d)thiophene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[c]phenanthrene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[ghi]perylene	No limit applies		0.014 ug/m ³			>100%
A1	Benzo[a]pyrene	No limit applies		0.014 ug/m ³			>100%
A1	Cholanthrene	No limit applies		0.014 ug/m ³			>100%
A1	Chrysene	No limit applies		0.014 ug/m ³			>100%
A1	Cyclopenta(c,d)pyrene	No limit applies		0.014 ug/m ³			>100%
A1	Dibenzo[ah]anthracene	No limit applies		0.014 ug/m ³			>100%
A1	Dibenzo[a,i]pyrene	No limit applies		0.014 ug/m ³			>100%
A1	Fluoranthene	No limit applies		0.31 ug/m ³			18%
A1	Indo[1,2,3-cd]pyrene	No limit applies		0.014 ug/m ³			>100%
A1	Naphthalene	No limit applies	0.37 ug/m ³	18%			

- [1] For dioxins and dioxin-like PCBs, the result are to be reported as a range based on: All congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum
- [2] The date and time of the sample that produced the result is given.
- [3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed  Date 13/7/18
(authorised to sign as representative of Operator)

Permit Number: EPR/XP3239GF

Operator: Veolia

Facility: Battlefield EFW

Reporting of periodically monitored emissions to air for the period from 01/07/18 to 31/12/18 Quarter 3&4

Emission Point	Substance / Parameter	Emission Limit Value	Reference Period	Result ^[1]	Test Method	Result Date and Time ^[2]	Uncertainty ^[3]
A1	Hydrogen fluoride	2 mg/m ³	Periodic over minimum 1-hour period	0.04 mg/m ³	BS ISO 15713	9/10/2018; 08:15 – 09:15	14%
A1	Cadmium & thallium and their compounds (total)	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.0012 mg/m ³	BS EN 14385	8/10/2018; 11:00 – 13:01	8%
A1	Mercury and its compounds	0.05 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.0055 mg/m ³	BS EN 14385	8/10/2018; 11:00 – 13:01	13%
A1	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	0.5 mg/m ³	over minimum 30 minute, maximum 8 hour period	0.016 mg/m ³	BS EN 14385	8/10/2018; 11:00 – 13:01	4%
A1	N ₂ O	No limit applies	Periodic Over minimum 1-hour period	8.38 mg/m ³	EA TGN M22	16/10/2018; 13:00 – 13:59	9%
A1	Dioxins / Furans (I-TEQ)	0.1 ng/m ³	over minimum 6 hour period, maximum 8 hour period	0.011-0.011 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	14%
A1	Dioxins / furans (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.012-0.012 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	14%
A1	Dioxins / furans (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.012-0.012 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	15%
A1	Dioxins / furans (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.018-0.018 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	17%
A1	Dioxin-like PCBs (WHO-TEQ Humans / Mammals)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.0016-0.0016 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	20%
A1	Dioxin-like PCBs (WHO-TEQ Fish)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.000089-0.000089 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	18%
A1	Dioxin-like PCBs (WHO-TEQ Birds)	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.005-0.005 ng/m ³	BS EN 1948	27/12/2018; 08:40 – 14:43	13%

A1	Poly-cyclic aromatic hydrocarbons (PAHs) Total	No limit applies	over minimum 6 hour period, maximum 8 hour period	0.69 ug/m ³	BS ISO 11338	28/12/2018; 06:35 – 12:37	9%
A1	Anthracene	No limit applies		0.013 ug/m ³			>100%
A1	Benzo(a)anthracene	No limit applies		0.013 ug/m ³			17%
A1	Benzo(b)fluoranthene	No limit applies		0.013 ug/m ³			>100%
A1	Benzo(k)fluoranthene	No limit applies		0.013 ug/m ³			17%
A1	Benzo(b)naph(2,1-d)thiophene	No limit applies		0.013 ug/m ³			>100%
A1	Benzo(c)phenanthrene	No limit applies		0.013 ug/m ³			>100%
A1	Benzo(ghi)perylene	No limit applies		0.11 ug/m ³			17%
A1	Benzo(a)pyrene	No limit applies		0.04 ug/m ³			17%
A1	Cholanthrene	No limit applies		0.013 ug/m ³			>100%
A1	Chrysene	No limit applies		0.013 ug/m ³			17%
A1	Cyclopenta(c,d)pyrene	No limit applies		0.013 ug/m ³			>100%
A1	Dibenzo(ah)anthracene	No limit applies		0.013 ug/m ³			>100%
A1	Dibenzo(a,i)pyrene	No limit applies		0.013 ug/m ³			>100%
A1	Fluoranthene	No limit applies		0.24 ug/m ³			17%
A1	Indo(1,2,3-cd)pyrene	No limit applies	0.026 ug/m ³	17%			
A1	Naphthalene	No limit applies	0.13 ug/m ³	17%			

- [1] For dioxins and dioxin-like PCBs, the result are to be reported as a range based on: All congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum
- [2] The date and time of the sample that produced the result is given.
- [3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed  Date 17/12/19
(authorised to sign as representative of Operator)

APPENDIX B

OPERATIONAL SUMMARY for each month of the YEAR to 31/12/2018

Average concentrations from valid 30 min (10 min for CO) averages.

Month	NOx	CO	SO2	HCl	VOC	NH3	Dust	Flow
	(mg/m3)	(mg/m3)	(mg/m3)	(mg/m3)	(mg/m3)	(mg/m3)	(mg/m3)	(kNm3/hr)
January	172	9	18	6	0.4	9	0.6	67.7
February	172	10	19	6	0.4	9	0.7	67.7
March	173	9	23	5	0.6	10	0.7	63.6
April	172	8	20	6	0.3	10	0.4	65.2
May	172	8	15	7	0.3	9	0.2	65.2
June	172	7	15	7	0.3	9	0.2	65.1
July	172	9	13	7	0.2	9	0.2	64.5
August	172	8	12	7	0.1	7	0.2	64.8
September	172	8	11	7	0.2	6	0.4	65.0
October	172	8	12	7	0.5	9	0.2	65.5
November	172	9	19	6	0.5	9	0.2	65.2
December	172	9	20	6	0.6	6	0.2	65.1
Yearly Average	172	9	16	6	0.4	9	0.4	65.4

Mass Releases

Month	NOx	CO	SO2	HCl	VOC	NH3	Dust	Operating Hours
	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(kg)	(hrs)
January	10790	503	1120	494	29	638	46	744
February	9756	502	1100	464	25	569	45	672
March	6367	306	831	255	23	444	29	467
April	10112	433	1191	494	23	678	28	720
May	10389	436	917	544	19	612	13	743
June	10042	412	853	553	20	625	10	719
July	10163	503	762	546	15	641	14	736
August	10318	464	728	569	10	505	15	744
September	8173	351	523	417	11	352	20	585
October	10495	465	725	569	35	634	16	744
November	10104	493	1091	507	35	585	11	720
December	9594	471	1115	473	37	366	14	685
Total	116301	5339	10956	5885	282	6649	261	8279

(Mass release is not confidence adjusted)

APPENDIX C

Reporting of residue quality for January - March 2018

* At least one of LOI or TOC to be reported.

PERMIT REFERENCE NUMBER : XP3239GF

OPERATOR : VEOLIA ES SHROPSHIRE LTD.

INSTALLATION : BATTLEFIELD EWF

FORM NUMBER : AGENCY FORM / ASH1

Ash Composition TOC			
	% Carbon (LOI) ^{w/w}		
Bottom Ash	4,19		

Ash Composition (Metals, Dioxins, etc.)																	
	Sb mg/ kg	Cd mg/ kg	Tl mg/ kg	Hg mg/ kg	Pb mg/ kg	Cr mg/ kg	Cu mg/ kg	Mn mg/ kg	Ni mg/ kg	As mg/ kg	Co mg/ kg	V mg/ kg	Zn mg/ kg	DIOXIN I-TEQ ng/kg	DIOXIN		
															WHO-TEQ ng/kg		
															Humans/ mammals	Birds	Fish
Bottom Ash	89,6	6,47	0,15	0,37	703	90,1	2329	909	87,7	20,6	49,4	120	2374	3,26	3,24	6,45	3,58
APC Residues	953	222	1,40	5,90	2155	74,7	718	472	30,5	120	7,60	53,2	17140	686	673	1420	773

Signed 
(authorised to sign as representative of Operator)

Date..... 20/4/18

Reporting of residue quality for April - June 2018

* At least one of LOI or TOC to be reported.

PERMIT REFERENCE NUMBER : XP3239GF

OPERATOR : VEOLIA ES SHROPSHIRE LTD.

INSTALLATION : BATTLEFIELD EWF

FORM NUMBER : AGENCY FORM / ASH1

Ash Composition TOC:			
	LOI (%)		
Bottom Ash	2.89		

Ash Composition (Metals, Dioxins, etc.)																	
	Sb	Cd	Tl	Hg	Pb	Cr	Cu	Mn	Ni	As	Co	V	Zn	DIOXIN I-TEQ ng/kg	DIOXIN WHO-TEQ ng/kg		
	mg/kg		Huma ns/ mam mals	Birds	Fish												
Bottom Ash	67	8.19	0.08	0.42	483	114	1929	1331	107	16.7	48.8	119	2352	5.14	5.88	8.05	6.05
APC Residues	906	255	1.5	54.3	2587	78.7	708	508	49.4	131	11.7	79.6	14940	405	389	948	443

Signed 
 (authorised to sign as representative of Operator)

Date.....13/7/18

Reporting of residue quality for July - September 2018

* At least one of LOI or TOC to be reported.

PERMIT REFERENCE NUMBER : XP3239GF

OPERATOR : VEOLIA ES SHROPSHIRE LTD.

INSTALLATION : BATTLEFIELD EWF

FORM NUMBER : AGENCY FORM / ASH1

Ash Composition TOC:

	% Carbon (LOI) ^{w/w}		
Bottom Ash	2.22		

Ash Composition (Metals, Dioxins, etc.)

	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg	DIOXIN I-TEQ ng/kg	DIOXIN		
															WHO-TEQ ng/kg		
															Hum ans/ mam mals	Birds	Fish
Bottom Ash	10.1	1.13	0.09	0.45	425	0.8	2473	799	59.8	12.4	2.2	28.4	1800	2.08	2.39	3.77	2.46
APC Residues	1192	307	1.00	7.00	2578	73.0	820	327	25.8	79.1	7.60	11.6	17030	368	359	762	405

Signed 
(authorised to sign as representative of Operator)

Date 22.11.18

Reporting of residue quality for October – December 2018

* At least one of LOI or TOC to be reported.

PERMIT REFERENCE NUMBER : XP3239GF

OPERATOR : VEOLIA ES SHROPSHIRE LTD.

INSTALLATION : BATTLEFIELD EWF

FORM NUMBER : AGENCY FORM / ASH1

Ash Composition TOC:			
	LOI (%)		
Bottom Ash	2.48		

Ash Composition (Metals, Dioxins, etc.)																	
	Sb mg/kg	Cd mg/kg	Tl mg/kg	Hg mg/kg	Pb mg/kg	Cr mg/kg	Cu mg/kg	Mn mg/kg	Ni mg/kg	As mg/kg	Co mg/kg	V mg/kg	Zn mg/kg	DIOXIN I-TEQ ng/kg	DIOXIN		
															WHO-TEQ ng/kg		
															Hum ans/ mam mals	Birds	Fish
Bottom Ash	115	16.7	0.08	0.41	1068	121	2043	859	89.2	13.9	37.6	37.8	3327	3.5	3.37	5.71	3.77
APC Residues	1115	355	1	9.9	2085	101	789	467	39.7	93.3	9.1	24.9	16220	332	324	702	361

Signed 
 (authorised to sign as representative of Operator)

Date 27/11/19